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The Role of Discovery in Strategic Improvement

Charles Liedtke, Ph.D.

Strategic Improvement Systems, LLC, caliedtke@aol.com

Abstract: Leaders of organizations are commonly faced with the challenge of building and managing a project portfolio in conjunction with Six Sigma and Lean initiatives to enhance the value provided to customers. Determining which projects to launch can be problematic if (1) there is an informal project selection process, (2) there are inexperienced senior leaders in the ways of Six Sigma and Lean, or (3) there are immature measurement systems. This paper describes how a formal *discovery system* can be used to identify project opportunities; evaluate and prioritize the opportunities; and present the project recommendations in a useful way to senior leaders. A *discovery system* is a network of discovery teams formed to search for project opportunities in targeted organizational units or in performance areas such as quality, cost, schedule, safety, education, and morale. Discovery teams use quantitative and qualitative investigative tools to search for project opportunities. Potential opportunities are evaluated and prioritized to create a short list of promising opportunities which are then subject to more rigorous cost/benefit and risk analyses. A medical center in the United States health care industry will be used as a case study to illustrate the concepts, methods, and tools associated with a *discovery system*. A *discovery system* can potentially be implemented by organizations in other industries.

Key Words: Strategic, Discovery, System

1.   Introduction to Discovery Systems

1.1 Fundamental concepts

Leaders of organizations can create and manage a *discovery system* to help them select projects in the context of strategic improvement approaches such as Six Sigma and Lean. A *discovery system* is a network of discovery teams formed to search for project opportunities in targeted organizational units or in performance areas such as quality, cost, schedule, safety, education, and morale. The word *network* in the preceding definition is used to suggest that discovery teams can potentially interact with each other as they search for project opportunities in order to benefit from each team's newly created knowledge.

There are different types of projects that can be undertaken to improve an organization from a strategic perspective such as Rapid Action, Standardization, Design, Improvement, and Lean projects. A *project* is defined here as, "a temporary and rational sequence of organizational activities undertaken to accomplish specified objectives." Leaders often face the challenge of determining which projects to select and launch. This challenge can potentially be exacerbated when there is an informal project selection process; when the leaders are inexperienced with strategic improvement approaches such as Six Sigma and Lean; or when the organization has an immature measurement system.

A *discovery system* is a type of knowledge management system in which discovery teams create, capture, integrate, and transfer knowledge related to project opportunities. The knowledge that is created can be either tacit or explicit (Polanyi (1966)). Also, it is possible for the four knowledge conversion modes of socialization, externalization, combination, and internalization to occur (Nonaka and Takeuchi (1995)). The link between knowledge and improvement has been suggested in the literature (e.g., Box and Draper (1987); Deming (1994); Linderman *et al.* (2004)). Discovery team members are knowledge workers doing knowledge work (Drucker (1999)) and so a *discovery system* allows formal and explicit knowledge management activities to precede strategic improvement activities.

Expectations can be high for new project teams. It is important that projects be selected appropriately and executed successfully. Figure 1 depicts the assertion that a *discovery system* can benefit project selection and project execution activities. A *discovery system* can potentially increase the likelihood that

leaders select appropriate projects by assuring discovery teams (1) use effective investigation methods, (2) make decisions based upon data, and (3) evaluate and prioritize numerous project opportunities.

Project Selection		Project Execution	
		Unsuccessful	**Successful**
	Appropriate		**Discovery System Impact**
Project Selection	**Inappropriate**		

Figure 1. Potential Contributions of a Discovery System

   A *discovery system* can potentially increase the likelihood that projects are successfully executed if some of the discovery team members become eventual project team members (team member continuity) and if project team members capitalize on the knowledge created during discovery. Project team members might also be more confident that the project they are working on is important and appropriate if discovery work is conducted.

1.2 Discovery Process

   Various processes can be used by a discovery team to identify and evaluate project opportunities. Figure 2 depicts a discovery process the author created to help leaders discover project opportunities. This process will first be conceptually described and then discussed again in the context of a case study.

Phase 1: Identify & Evaluate Project Opportunities

   Each discovery team searches for project opportunities using various investigation methods such as observation; data collection and analysis; flowcharting; process analysis; and brainstorming. The investigation methods result in a list of *potential* project opportunities which are evaluated and prioritized using a filter (set of criteria) to arrive at a shorter list of *promising* project opportunities. The promising

opportunities are "typed" as Rapid Action, Design, Standardization, Improvement, or Lean projects.
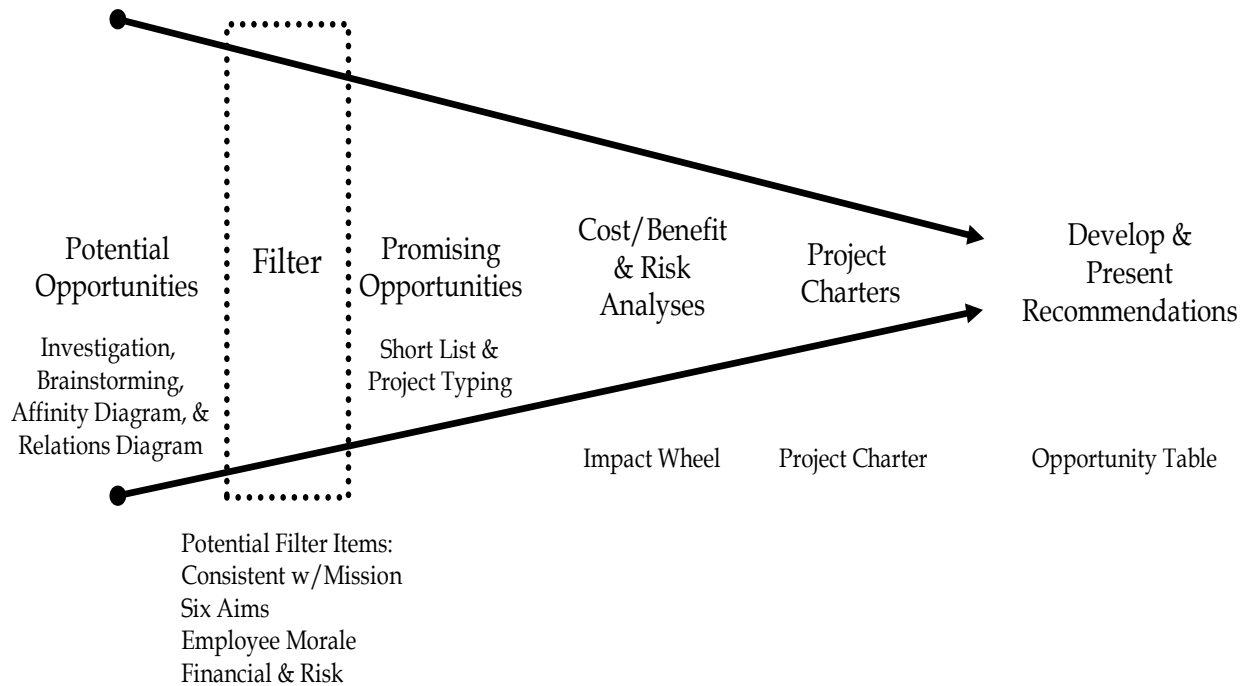
Potential
Opportunities

Investigation,
Brainstorming,
Affinity Diagram, &
Relations Diagram

Filter

Promising
Opportunities

Short List &
Project Typing

Cost/Benefit
& Risk
Analyses

Project
Charters

Develop &
Present
Recommendations

Impact Wheel

Project Charter

Opportunity Table

Potential Filter Items:
Consistent w/Mission
Six Aims
Employee Morale
Financial & Risk

Figure 2. Discovery Process

Phase 2: Conduct Cost/Benefit & Risk Analyses

  Promising project opportunities are subjected to formal cost/benefit and risk analyses. Some project

opportunities may be "tabled" at this point if the cost/benefit analysis and/or risk analysis reveals the

project opportunity is not desirable enough.

Phase 3: Develop Project Charters

  A project charter is created for those project opportunities that survive the cost/benefit and risk

analyses. A project charter describes the type of project and includes information on the project objective,

who would be impacted, scope, business case, proposed players, expected benefits, and potential risks.

Phase 4: Present Project Recommendations

  Discovery teams present their project recommendations to senior leaders during a formal

presentation session. Each team's presentation would include: List of Promising Opportunities; Quick

Hits Discovered (immediate improvements); Data Collection Analysis and Status; Cost/Benefit Analysis;

Risk Analysis; Lessons Learned; Difficulties Experienced; Next Steps; and Questions for the Group.

A medical center in the United States health care industry will now be presented as a case study to

illustrate the concepts, methods, and tools associated with a *discovery system*. The senior leaders of this

medical center used the *discovery system* approach in 2003 and 2004 to select projects.

2. Case Study: Immanuel St. Joseph's, Mayo Health System

2.1 Introduction to Immanuel St. Joseph's, Mayo Health System

Immanuel St. Joseph's, Mayo Health System (ISJ) is a regional medical center headquartered in

Mankato, Minnesota, United States. ISJ is an organizational unit within the Mayo Health System which

itself is an organizational unit within the Mayo Foundation. The Mayo Health System has roughly 650

physicians in a multi-site group practice involving integrated hospitals and clinics located in three states in

the midwest United States: Minnesota, Iowa, and Wisconsin. ISJ is licensed for 272 hospital beds and

is currently staffed for 159 hospital beds. There are approximately ninety-seven practicing physicians

employed by ISJ with plans to add at least twenty-five more. ISJ has approximately 1,800 non-physician

employees. The number of inpatient admissions in 2004 was 13,132 and the number of outpatient visits in

2004 was 158,860. ISJ serves approximately 43,000 unique patients throughout its service area which

spans several counties.

2.2 The Need for Strategic Improvement at ISJ

ISJ needed to address numerous financial issues and performance issues in 2002. William C. Rupp,

M.D., assumed the President and Chief Executive Officer roles in the latter part of 2002. His aim at that

time was to address the financial and performance issues; develop a high-performing Senior Team (the

top management team of ISJ); engage numerous ISJ employees in strategic improvement activities; and

develop long-term strategic improvement capabilities throughout ISJ. The author was retained as a

consultant to help develop and execute a strategic improvement plan for 2003 which is depicted in

Figure 3 and described shortly.

Health care leaders found themselves facing many challenges in 2003 such as new technology;

regulatory compliance; increasing demands for public reporting of performance data; and payer

organizations demanding higher quality of care at lower costs. Dr. Rupp and his Senior Team embraced the Six Aims for Health Care described by the Committee on Quality of Health Care in America, Institute of Medicine (2001). The Six Aims state that health care should be patient-centered, safe, timely, effective, efficient, and equitable. The leaders of ISJ decided to develop both technical improvement capabilities and cultural improvement capabilities (Schein (2004)). The ISJ Strategic Improvement Plan for 2003 consisted of four phases. It was hoped that the successful execution of this plan would lead to short-term and long-term results and develop ISJ's strategic improvement capabilities.

Phase 1: Alignment and Focus

   Three Strategic Direction workshops were conducted in early 2003 and they were attended by over fifty leaders in the organization. They collectively reached consensus on (1) organizational performance measures, (2) an inventory of major processes, (3) a system map depicting major patient experiences, (4) strategic issues facing the organization, and (5) areas of investigation for discovery teams.

Phase 2: Discovery and Data

   Eight interdisciplinary discovery teams were formed to identify project opportunities; evaluate and prioritize the opportunities; and present the project recommendations in a useful way to senior leaders. Approximately twenty people also attended a Basic Data Analysis course to develop the analytical skills of key employees so they could support discovery teams. Over fifty leaders within ISJ were involved in the selection of projects based on the recommendations of the discovery teams. Seven projects were eventually launched.

Phase 3: Portfolio Management

   The Senior Team managed the newly formed project portfolio consisting of three Improvement projects and four Design projects.

Phase 4: Long-Term Planning

   Time was taken to reflect back on the year's improvement activities in terms of benefits realized, lessons learned, and difficulties experienced and then develop the ISJ 2004 Strategic Improvement Plan.
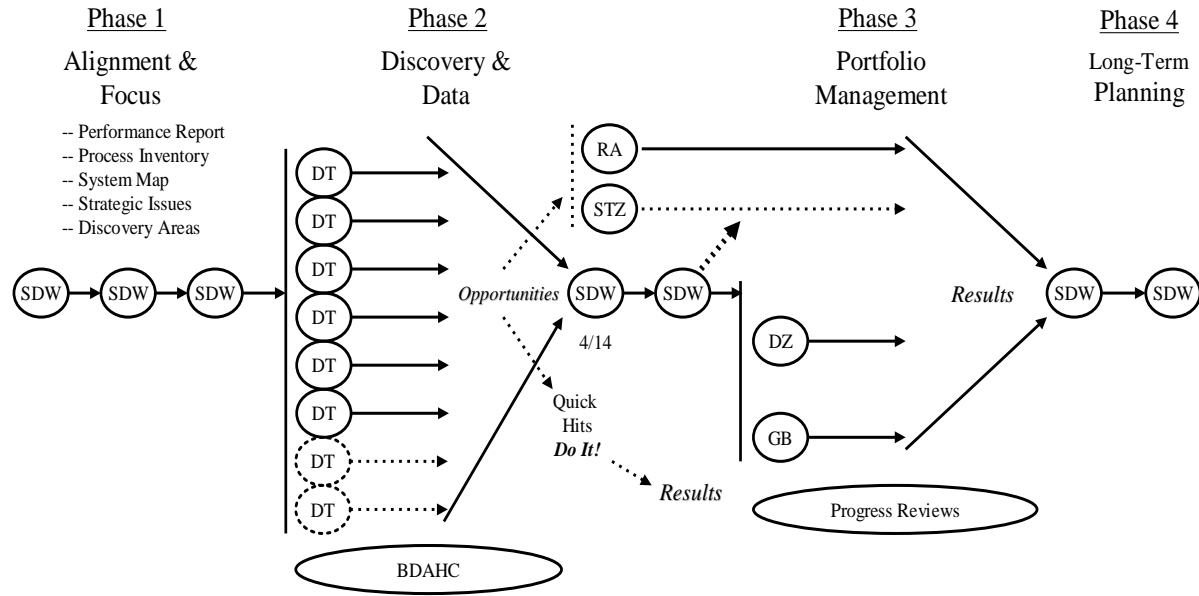
Figure 3. ISJ 2003 Strategic Improvement Plan

2.3 ISJ Discovery Activities in 2003

Eight discovery areas were selected during the Strategic Direction workshops which led to the formation of eight interdisciplinary discovery teams in 2003: Regulatory Compliance, Financial, Medication Management, Service Growth, Access, Revenue Management, Care Delivery, and Standardization. There were approximately fifty-six people collectively on the eight teams including Senior Team members, physicians, nurses, department directors, and other ISJ employees. Figure 4 depicts the major discovery activities conducted at ISJ in 2003.

Discovery teams attended three workshops where team members learned various discovery concepts, methods, and tools. Workshop topics included: ISJ Strategic Direction, Stakeholder View of ISJ, Systems Thinking, Performance Measures, Types of Projects, Team Management, Data Collection and Analysis, Affinity and Relations Diagrams (Nayatani *et al.* (1994)), Brainstorming, Flowcharting, Workflow Diagrams, Process Analysis, Prioritizing Projects, Impact Wheel, and Project Charters.

Discovery teams received just-in-time training during Workshop 1 and then they conducted discovery

activities until Workshop 2. This pattern repeated itself until the presentation session on April 14.
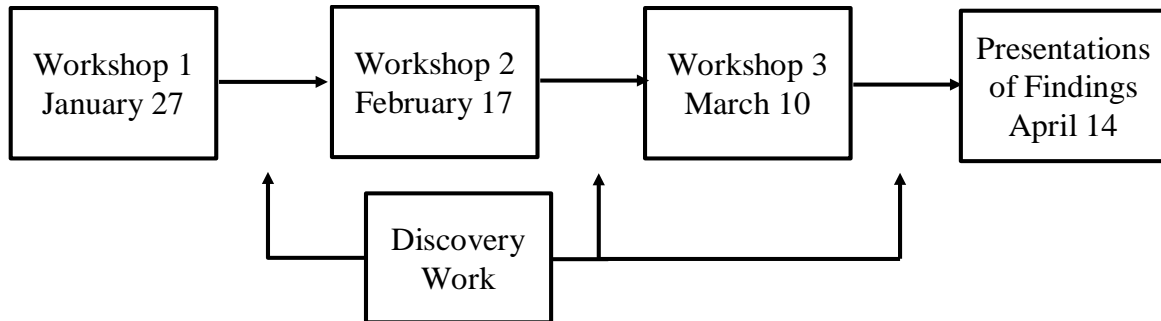

Figure 4. Major Discovery Events at ISJ in 2003

The discovery teams recommended 19 projects. Seven projects were eventually selected and launched

including four Design projects and three Improvement projects. These became the first seven projects in

the Senior Team portfolio along with a regulatory compliance project.

2.4 ISJ Discovery Activities in 2004

A new *discovery system* was created early in 2004 consisting of six discovery teams: Operative Services,

Pain Management, Patient Flow, Access, Voice of the Customer, and Magnet Status. Figure 5 depicts

the major discovery activities conducted at ISJ in 2004. The 2004 *discovery system* differed from the 2003
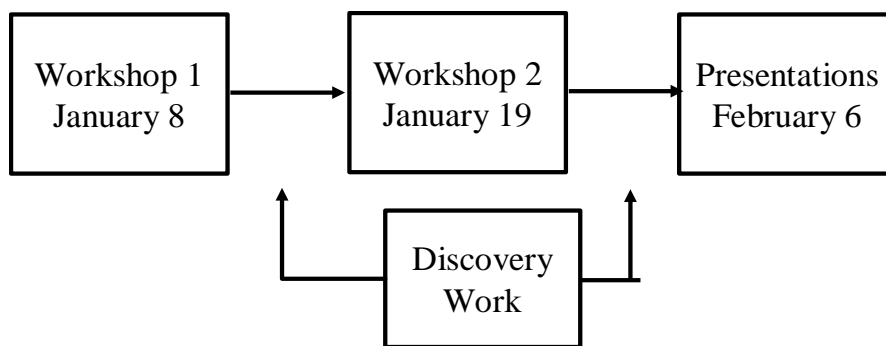

Figure 5. Major Discovery Events at ISJ in 2004

discovery system in that two workshops were conducted instead of three and the elapsed time from the

first workshop to the presentation session was roughly four weeks instead of ten weeks. This reduction in

discovery system cycle time resulted in the projects being selected earlier by the Senior Team, but it required extreme focus and discipline on behalf of the discovery team members. It helped that many of the 2004 discovery team members were familiar with the concepts, methods, and tools from their 2003 work which helped accelerate discovery team progress.

The discovery team presentations led to the selection of another four Design projects and three Improvement projects. It is interesting to note that the *discovery systems* led to the launching of more Design projects after the first two years (eight) than Improvement projects (six).

2.5 ISJ Discovery Activities in 2005

A formal *discovery system* was not used in 2005 in part due to a better integration of project selection and strategic planning; Senior Team members were more experienced with the different types of projects; and there were more mature measurement systems at ISJ. One key objective related to strategic improvement at ISJ in 2005 was to successfully integrate organizational activities in Six Sigma (e.g., Schroeder *et al.* (2005); Snee and Hoerl (2003)); Lean (Liker (2004); Ohno (1988); Womack and Jones (2003)); Balanced Scorecard (Kaplan and Norton (1996)); and the Malcolm Baldrige National Quality Award (National Institute of Standards and Technology (2004)).

2.6 Reported Benefits from Discovery Activities

Five ISJ employees with extensive *discovery system* experience were surveyed to identify the benefits that were realized because of discovery activities and the challenges that were associated with discovery activities. Their responses were sorted into groups based on similarities which resulted in five emergent themes. The following are five emergent themes related to realized benefits.

Theme 1: The Discovery System Provided Structure

Respondents commented that the *discovery system* provided a structured way to identify and prioritize problems leading to discrete projects. They also commented that the *discovery system* kept the teams moving forward and forced teams to make decisions based upon data.

Theme 2: The Discovery System Created a Focus

Respondents commented that the *discovery system* forced the discovery teams to focus on quality, safety, and customer needs resulting in less "tension" between competing medical groups.

Theme 3: The Discovery System Created a Connection to Leaders and Strategy

   Respondents commented that the *discovery system* provided a way to connect to the organizational

mission because mission components were used to evaluate project opportunities. Also, the Senior

team sent *messages* to the organization that they were driving the improvement plan, that they were

willing to change, and that discovery and improvement were now a natural part of ISJ work.

Theme 4: The Discovery System Engaged and Connected Employees

   Respondents commented that morale was improved because leaders (1) involved them in the discovery

work, (2) provided them with new tools, (3) valued the work and ideas of employees, and (4) allowed

employees to learn from each other within the interdisciplinary teams and between the discovery teams.

Theme 5: The Discovery System Built Organizational Energy and Momentum

   Respondents commented that the *discovery system* excited many people in the organization and built

organizational energy and momentum.

2.7 Reported Challenges Associated with Discovery Activities

   Respondents also identified challenges associated with discovery activities which will now be discussed.

Theme 1: Competition for Resources

   Respondents commented that the *discovery system* competed for financial and human resources with

other organizational initiatives and that discovery team members had difficulty attending meetings.

Theme 2: Steep Learning Curve

   Respondents commented that discovery activities in 2003 were especially difficult because discovery

team members were learning the concepts, methods, and tools and the value of those items. There were

no trained coaches for the teams in 2003. Also, the discovery team champions attended events with

discovery team leaders which sometimes led to role confusion.

Theme 3: Importance of Measurement

   Respondents commented that data was sometimes available for making decisions regarding project

opportunities, but the data often lacked integrity or was in a format that was not usable. Also, scant data

was available for quantifying the potential financial impacts of project opportunities.

Theme 4: Varying Levels of Buy-In

   Respondents commented that not every leader or employee *bought in* to the discovery activities or were willing to learn new things and change. Also, some employees who were not selected for the discovery teams perceived those who were selected as "favorites" which resulted in some resentment.

Theme 5: Maintaining Rigor and Discipline

   Respondents commented that discovery team members had difficulty adhering to the discovery process and staying disciplined because it was not part of their past experience. Also, some people wanted to jump to solutions and momentum was hard to maintain when no real results were seen during discovery.

3. Conclusion

   A *discovery system* is a type of knowledge management system that can be used to select strategic improvement projects. However, it might not be appropriate for every organization. Future research could reveal under what conditions the use of a *discovery system* is appropriate (Christensen et al. (2004)). The author believes that the use of a *discovery system* is appropriate when an organization has an informal project selection process; when an organization is deploying Six Sigma or Lean and has little experience with those approaches; or when an organization has immature measurement systems.

   The experience with *discovery systems* at ISJ revealed many benefits, but also many challenges. A *discovery system* does appear to be a mechanism for integrating knowledge management and strategic improvement activities by creating a learning network of knowledge workers. Leaders may be able to improve project selection and project execution through the use of a discovery system.

Acknowledgements

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