

**Business Value of Knowledge Management:
Return on Investment of Knowledge Retention Projects**

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5 **ABSTRACT**

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7 The impacts of current economic conditions, organizational downsizing, internal
8 and external terrorist attacks, as well as a reduction in personnel through retirement,
9 resignation, or death have increased recognition of the importance of managing
10 corporate knowledge. This recognition has reinforced the concept of Knowledge
11 Management (KM). Although the business value of Knowledge Management continues
12 to be debated, it is evident that organizations need to manage their valuable corporate
13 knowledge from a practical standpoint. While some companies report substantial
14 benefits from KM, others report that KM has not had an impact on the bottom-line. The
15 need for a systematic investigation of the impact of KM has become increasingly
16 essential. An investigation of the relationship between measuring the impact of KM on
17 the facets of business value is reported in this research. The results suggest that KM
18 investments in different types of knowledge retention projects have begun to show
19 positive results with respect to the organization.

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21
22 **Keywords:** Business Value Knowledge Harvesting
23 Competitive Advantage Knowledge Retention
24 Intellectual Assets Return on Investment
25 Knowledge Management

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28 **ISRL categories:** AC04, AI, FA, DA08, IB01, EI
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4 **INTRODUCTION**

5
6 It has been claimed that an organization's most valuable resource is its
7 knowledge. Many researchers and practitioners agree that Knowledge Management
8 (KM) must be defined in terms of business objectives. Once these goals are defined,
9 organizations can determine what corporate knowledge should be harvested, organized,
10 managed, shared and measured. "Successful KM begins with hard decisions about
11 what knowledge is worth managing" (Rossett & Marshall, 1999). Although the business
12 value of Knowledge Management continues to be debated, it is evident that
13 organizations need to manage their valuable corporate knowledge from a practical
14 standpoint. Organizational resistance to KM efforts is attributed to the lack of evidence
15 that KM implementations are effective and can be measured, resulting in a positive
16 impact to the bottom-line. The difficult question, however, remains of how to measure
17 this valuable resource.

18 Organizations continue to be perplexed as they search for a methodology that
19 can be used to assess the effectiveness of KM within the organization. Successful KM
20 programs can demonstrate clearly defined links to bottom-line business benefits.
21 Therefore, it is essential that managers establish a substantive method to measure the
22 return on investment of KM. This study addresses the issue of KM effectiveness by
23 proposing a methodology that demonstrates a quantifiable and substantial return on
24 investment of knowledge retention projects within the organization.

BACKGROUND

1
2
3 A manager's major concern should be centered on the knowledge required to
4 perform the organization's critical processes and tasks, while attempting to facilitate
5 improvement and change as well as evaluate KM impacts within the organization.
6 Organizations, recognizing this need, are now striving to establish knowledge
7 management measurement systems to reveal the impact of KM in the dynamic
8 business environment. Furthermore, a principle value of communication is to establish a
9 way to improve knowledge transfer or sharing (Nonaka & Takeuchi, 1995; Davenport &
10 Prusak, 1998); thus, an effective KM plan must address organizational memory
11 management. The lack of effective management of knowledge could be because most
12 organizations are still struggling to comprehend the KM concept (Holsapple & Joshi,
13 2002); therefore, managers must analyze and understand the workflow and business
14 process of the organization to effectively manage the intellectual assets of the company,
15 (Bixler, 2002).

Knowledge Management

16
17 "Knowledge Management (KM) is the discipline that focuses on capturing,
18 organizing, filtering, sharing, and retaining key corporate knowledge as an asset"
19 (McManus & Snyder, 2003, p.89); while "managing the leadership, organization,
20 technology and learning aspects of internal and external intellectual assets through
21 retention and collaborative sharing of knowledge for the purpose of improving
22 performance and inspiring innovation throughout an enterprise" (Bixler, 2002, p. 18).
23 KM is a practice that finds valuable information and transforms it into necessary
24 knowledge critical to decision-making and action by integrating techniques from the

1 fields of organizational learning, performance management, and quality management
2 (Kirrane, 1999).

3 Institutionalizing knowledge sharing and implementing systems to capture
4 valuable knowledge are examples of KM-oriented activities. Knowledge retention is one
5 type of KM activity. For example, human resource professionals or knowledge
6 management personnel may perform these retention actions. HR-oriented knowledge
7 retention activities may include career succession planning, managing phased
8 retirements, contracting with consultants, reinventing the recruiting process,
9 and outsourcing. A KM system must be implemented to capture and retain the
10 knowledge gained from these activities. The relationship between managing
11 organizational improvement and conducting retention projects can be achieved by
12 applying the knowledge harvesting process, as illustrated in Figure 1.

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Insert Figure 1
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17 **Knowledge Harvesting**

18 Knowledge Harvesting¹ is a mature methodology for rapidly converting top-
19 performer expertise into knowledge assets that improve the organization's performance.
20 User organizations are protected from knowledge degradation resulting from personnel
21 losses, employee defections, and unavailability of needed experts at the right time and
22 place. These knowledge assets also contribute to corporate competitiveness,
23 profitability and valuation. The examples cited in this research are knowledge retention

¹ Knowledge Harvesting is a registered trademark of Knowledge Harvesting Inc.

1 projects, which employed Knowledge Harvesting as the approach for eliciting and
2 organizing vital know-how.

3 Knowledge Harvesting is an integrated set of processes whereby the hidden
4 insights from top performers are converted into specific, actionable know-how that is
5 able to be transferred to thousands of employees via software (Snyder & Wilson, 1998).
6 The Knowledge Harvesting (KH) Framework presented in Figure 2 depicts this process
7 (Snyder, Wilson & McManus, 2000).

8
9

Insert Figure 2
About Here

13 The KH framework can assist managers in their efforts to harvest and preserve
14 essential knowledge surrounding the organization's key processes. The first step,
15 Focus, is to determine the existing explicit knowledge and implicit (tacit) knowledge that
16 is needed for the focal process. The second step consists of finding top performing
17 people and their critical activities. Once identified, an understanding of these activities
18 will be elicited from the key individuals. The activities of the top performers are educed
19 and logically mapped in the knowledge harvesting process.

20 The knowledge must be arranged in an organized coherent or systematic form.
21 The determination of how to properly package the knowledge so that it can be available
22 when and where needed is a necessity. These knowledge processes are recorded in a
23 database that is accessible through a software package. Sharing allows for the
24 distribution of captured knowledge throughout the organization to individuals or groups
25 that may require this relevant information. The purpose of a KM system is to allow
26 people other than the key players to use or apply the same decisions rules; thus,

1 employees can seek assistance from the database of knowledge that has be gained
2 and stored from the experts of the organization. Evaluation must be performed in order
3 to determine the effectiveness of the applications. The KM system must incorporate the
4 ability to adapt to new knowledge so that it can be refreshed. By instantly recording all
5 input information generated during the learning sessions, these processes increase the
6 organization's ability to make effective use of all harvested know-how.

7 Although organizations view knowledge as one of the most important assets, it is
8 typically recorded as an expense, (Grayson, 1996). "Since managers are interested in
9 capturing relevant knowledge about the key processes of their firms, it is now apparent
10 that this should be part of the strategic goals of the company" (Snyder, Wilson &
11 McManus, 2000). It has been argued that KM is the process through which
12 organizations extract value from intellectual assets; thus, investments in KM should
13 create business value. While many organizations are discussing the value of KM
14 systems, few have determined the best methodology to measure this perceived value.
15 The proposed methodology in this research provides a means of calculating the
16 economic benefit of knowledge retention projects.

17 A review of the literature suggests that there have been numerous attempts at
18 quantitatively measuring knowledge capital; however, intangible knowledge within the
19 organization is very difficult to measure. The purpose of this research is to extend the
20 first step of the KM process, with a priority on developing an effective measurement
21 strategy for calculating return on investment.

22

KNOWLEDGE RETENTION PROJECTS

A well-defined KM process should provide a foundation for the organization to understand its knowledge resources and activities, resulting in a defined method of organizational measurement. To extend the first step, Focus, of the KM framework, Figure 3 depicts the three aspects of measuring KM value for organizational projects; specifically knowledge retention projects, through project documentation.

Insert Figure 3
About Here

Project Plan

Project plans provide the design and scope necessary to define the requirements needed for the work process. The plan includes steps for documenting, implementing, and maintaining the KM system, with an emphasis on structure and return on investment indicators that are accepted by the stakeholders.

“Discussing the usefulness of a project plan is a first step in managing free-wheeling employees and a project plan is an investment of time and money. If a manager decides to use a plan, reviewing the project variables will help provide ideas on the best project plan mechanics to use to control the project.”
(Rosenwinkel, 1995).

For the knowledge harvesting process, project plans should be aggregated into three-month groups and should always be determined prior to measuring ROI. These project variables can be broken down into people variables and project variables. (Rosenwinkel, 1995). The project plan will have a milestone schedule, project-costing information, and responsibility lists. It is our contention that the project plan is prepared prior to knowledge harvesting and specifies the measures required to report ROI.

1 **Value Proposition**

2 Value proposition states how KM can help the organization achieve its goals better,
3 faster, or cheaper. Value is considered to have worth in usefulness or importance to the
4 possessor. In determining the best methodology for assessing the value of KM,
5 managers must consider measurable process improvement, cost savings, business
6 enablement, and risk reduction. We focus on measures of process performance as the
7 best place to demonstrate the efficacy of KM.

8 A knowledge project should focus on a specific business problem that can be
9 quantified, in terms of what the problem costs the company. The measurement
10 for value is the most important thing. A knowledge management strategy based
11 off of a fact-based business case that shows it will create value for the
12 organization is vital, (MacSweeney, 2002, p. 44).

13
14 “Value is often associated with some form of measurement. Today we have
15 slowly learned to value immeasurable things like knowledge but to value even more
16 intangible things like tacit knowledge is unusual “(Haldin-Herrgard, 2000, p. 362). It is
17 our contention that the impact of knowledge is measurable and the impact of elicited
18 tacit knowledge (implicit) should be measurable.

19 **Return on Investment (ROI)**

20 Return on Investment (ROI), a traditional financial measure, has been identified
21 as a financial indicator for measuring KM. The problem for measuring productivity for
22 knowledge workers is that much of their output is intangible; hence, surrogate measures
23 may be misleading. Performance measurement provides the organization with a
24 “device through which to focus and enunciate accountability” (Sharman, 1993) and “an
25 objective, impersonal basis for performance evaluation” (Sloma, 1980).

26 A recent study reported “that only a very limited number of organizations have a
27 mechanism to track the return on investment in knowledge-based competencies
28 or related intangible assets” (Chong, Holden, & Schmidt, 2000).

1 Measurement techniques should be applied to develop a method for generating a
2 class of information that will be useful in a wide variety of problems and situations (Zairi,
3 1994). Some firms attempt to measure KM by estimating the value of the tangible
4 assets, such as software or trained employees. Traditional financial methods, such as
5 economic value added, total cost of ownership or balanced scorecard may be very
6 effective with measuring tangible assets, but not intangible assets. Until organizations
7 determine an effective way to measure their intangible KM benefits, they will continue to
8 have constraints that will prevent the adoption/proliferation of the KM process.
9 Therefore, we present a methodology to measure the impact of elicited tacit knowledge;
10 specifically, return on investment for knowledge retention projects.

11 **STAGES OF RETURN ON INVESTMENT METHODOLOGY**

12
13
14 Since measuring knowledge is vital to organizations, it becomes a tool that can
15 be utilized to evaluate, control, and improve existing systems. “Organizational culture is
16 increasingly recognized as a major barrier to leveraging intellectual assets. Knowledge
17 ultimately assumes value when it affects decision making and is translated into action”
18 (DeLong, 2000, p. 126). Although many executives would agree that implementing KM
19 practices is logical and valuable to the firm, they are faced with continued request to
20 generate a financial report of the success of the knowledge retention projects. It is not
21 uncommon for senior managers to focus their attention on the ROI when deciding if a
22 project should “stay or go”. Thus, executives are more willing to calculate bottom-line
23 impact and deliver a dollar-value (ROI) for managing knowledge.

24 “It is argued that firms unable to manage knowledge assets will be increasingly
25 uncompetitive in the future business environment. However, the culture must adapt to

1 the new environment or else the ROI will indeed not support the business case (Nash,
2 2002). It is important that everyone involved define ROI in the same way, while
3 understanding the limits of the concept when used to support business decisions.
4 Specifically, for this research, we define ROI as the percentage return made over a
5 specified period of time as a result of investing in a knowledge retention project. Many
6 organizations have a misconception that a knowledge retention project will not indicate
7 positive financial results for years; however, the problem that should be addressed is
8 the appropriate metrics for measuring ROI for knowledge retention projects. As
9 illustrated in Figure 4, a four-stage approach for measuring return on investment is
10 presented. The brief description of the four stages is followed by a detailed analysis of
11 the orientation component of the definition stage, which is the focus of this research.

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17 **Definition Stage**

18 The definition stage identifies the requirements of the project. A description of
19 the situation will be created by eliciting information from stakeholders concerning the
20 expected results of the proposed project. Questions will be posed to the stakeholders:
21 “What are the driver/signals for this project; what do you expect to be delivered from this
22 project; have you initiated similar projects in the past; and what is the orientation of the
23 project?” The purpose of this task is to explicitly understand and document the reason
24 for existence of the upcoming project; hence, identify the work requirements. In order to
25 accomplish this task, apparent traits will surface that are specific to the project and will

1 aid in determining the best orientation for this project. During this stage, the value
2 proposition will be created; thus, a review of the project plan is necessary to confirm the
3 requirements set forth by the stakeholders.

4 **Cost Analysis Stage**

5 The cost analysis stage determines the costs associated with the knowledge
6 retention project. This analysis is considered the easiest task of measuring ROI;
7 however, it can be difficult to estimate time. The developmental labor, training costs,
8 maintenance labor, and cash outflows associated with plant, property and equipment
9 must be considered in this stage. Labor will be consistently divided into three
10 categories: consultants, dedicated full time employees and dedicated part-time
11 employees. Costs for training employees, which include compensation for trainers and
12 training materials, must be considered. In addition, maintenance labor is the labor
13 required to annually evaluate and adapt the knowledge asset, which may include
14 software and hardware upgrades. Finally, any cash outflows associated with plant,
15 property and equipment should be included in the cost analysis stage.

16 **Benefit Analysis Stage**

17 The benefit analysis stage determines the non-cash benefits. Stakeholders must
18 answer questions: “Will you deploy the knowledge asset in phases; do you expect to
19 receive more than one payment; or do you expect equal payments?” It is important to
20 determine if the organization will redeploy or reduce personnel or equipment. Some
21 non-cash benefits that would be generated from a knowledge retention project would
22 include efficiency, such as reducing the number of customer support calls. In addition,
23 providing free training and/or certification to customers, partners, and suppliers, which

1 could result in delivering more revenue-generating courses to more customers. Finally,
2 shorter time to product deployment by shrinking training time, re-training for growth and
3 turnover, and increase productivity time on the job. In this stage, the organization can
4 measure intangible and tangible non-cash benefits.

5 **The Computation Stage**

6 In the computation stage, the stakeholders must determine what financial results
7 can be calculated from the implementation of the project. They want to calculate cash
8 inflows, and cost of capital. Traditional measurements would include return on assets
9 (RONA), free cash flow (FCF), earnings before income tax (EBIT), return on investment
10 (ROI), and net present value (NPV). It is recommended that the stakeholders create a
11 list of candidate measures, create baselines and target measures, and determine
12 specific details about each measure. As the stakeholders apply these measurement
13 techniques to their projects, they will have a basis for comparison such that differing
14 types of projects can be compared and contrasted.

15 The four stages of ROI are valuable to all knowledge retention projects and
16 should be given careful consideration when initiating a new project. However, the
17 broader realm of the four stages is beyond the scope of this paper. Instead, we focus
18 on one component of the definition stage. Specifically, this study will focus on
19 determining the orientation of a proposed knowledge retention project.

20 **DEFINITION STAGE: DETERMINE ORIENTATION**

21 In the orientation phase of the definition stage, the stakeholder must explain the
22 rationale for the project. In order to design an effective measurement system, we
23 contend that a process orientation should be taken from the beginning to find concrete

Efficiency

Efficiency has been defined as the ratio of effective or useful output to total input of any system, with a goal of minimizing wasted time and effort. Managers seek efficiency when requesting that existing work be performed at lower costs or requesting a budget decrease of 14%, while maintaining the same level of output. Organizations continue to be challenged by the decision to either produce the same quality of work at a lower price or outsource the work to save money.

A knowledge retention efficiency-oriented project is one that yields the same amount of work with less cost and less time. The purpose of this project is to enhance operational efficiency and diminish the cost per transaction, while moving work from a high-cost group to a low-cost group. Typically, the low-cost group lacks a baseline process; thus, the goal is to get the process right or “doing the thing right”. An example of this orientation would be to move a highly technical expert to a service center. The captured expertise can be disseminated to the service center representatives; thus, every employee in the service center should be able to solve routine problems.

In the efficiency-orientation project, knowledge harvesting is primarily focused on guidance and support information³. Guidance information⁴ is captured down to the lowest level of abstraction, which provides all target learners/performers with explicit know-how about accomplishing the requisite work. In addition, the typical ROI for the efficiency-oriented project can be estimated as a ratio of 6:1. In other words, is the stakeholder willing to spend one dollar today to potentially make six dollars tomorrow.

³ Support information helps a learner achieve understanding by delivering information such as basic definitions and purpose statements.

⁴ Guidance provides information for taking action. Guidance is also known as advice, coaching, how-to information, counsel, directions, instructions, methods, procedures, processes, prompts, explanations of the work, protocol, techniques, and tutoring. Four levels distinguish guidance: process, sub-process, task and element.

Productivity

Productivity is defined as having the power to produce; specifically, the rate at which goods and services are produced especially output per unit of labor. When focused on productivity, the unit of measure is expressed “in time.” Managers realize that they must improve the productivity of their core competency, which is the most important work they can perform. They continuously strive to build on their strengths, with a target goal of ruling the market associated with their specific focus. Otherwise, failure to adequately perform critical activities of a process could jeopardize the entire business and make the organization vulnerable in the marketplace. Although capable stakeholders are available to perform a process, they have difficulty achieving excellent (expected) results (outcomes) or raising their performance level to a competent/expert level.

A knowledge retention productivity-orientation project is one in which the same amount of effort yields more work results. The purpose of this type of project is to improve the overall productivity and facilitate knowledge transfer in order to extend the abilities of others. The goal is to improve the overall average of productivity; thus, target learners are doing the same job, but better. In this orientation, the strategy is work effectiveness, while lowering cost per unit and increasing margin. A knowledge retention project strives to increase the intellectual specialization within the organization, by getting the right process or “doing the right thing”. An example of this orientation would include a more effective troubleshooting process, whereby, one person can perform the task originally requiring three to five individuals. The resulting benefit of this process is to create a knowledge matrix with individuals who have differing perspectives on

1 different aspects of the problem. In the productivity-orientation project, knowledge
2 harvesting is primarily focused on signals⁵ and guidance levels two and three. Finally,
3 the typical ROI for the productivity-oriented project can be estimated as a ratio of 10:1.

4 **Risk Mitigation – “Brain Drain”**

5 Risk Mitigation or “Brain Drain” is a term used to describe the gradual depletion
6 of intellectual power within the organization. This would be indicative of a gradual
7 diminution or drain on the resources of organizational knowledge. Corporations often
8 experience a natural reduction in personnel through retirement, resignation, or death.
9 When this natural attrition occurs, the “keepers” of the process or knowledge leave the
10 company increasing the risk of losing valuable knowledge. The company must
11 immediately address not only where the expertise loss occurs within the organization,
12 but also the staffing deficiency resulting from downsizing, merger/acquisitions and
13 attrition. Experts in these processes may prove difficult to locate or unavailable for
14 consultation. It is imperative that companies stop reinventing the proverbial wheel, by
15 creating a corporate memory to preserve vital knowledge.

16 A knowledge retention risk mitigation orientation project is defined as the gradual
17 depletion or complete loss of valuable knowledge that is essential to the success of the
18 organization. The primary purpose of this orientation is to sustain the current level of
19 productivity and mitigate any risks associated with employee migration. It has been
20 estimated that when companies are faced with “brain drain”, the average cost of
21 turnover is 1.5 times the annual salary of the job. On average, it takes 13.5 months for

⁵ Signal is a type of information that delivers contextual cues. It may be an issue, issue symptom, contextual or situational variable, environmental influence, stimulus, cause, influence, event, experience, perceptible or imperceptible trigger, change variable, unique circumstance, antecedent, or condition).

1 new employees to maximize their efficiency. Therefore, the goal is get a new employee
2 to perform the prior employee's workload in less time. The sacrifice of efficiency and
3 effectiveness are results of the loss of a valuable employee.

4 One example would include a stakeholder group. As long as the stakeholder
5 group remains stable and relatively small (2-4 people), memory of the group's process
6 knowledge, decisions, actions, and rationales resides in the personal long-term memory
7 of the individuals. Individuals take with him/her the unique perspective of the group's
8 process knowledge that was stored in personal long-term memory; thus, difficulty arises
9 when someone leaves the original group and is replaced by a new person. If the entire
10 composition of the group turns over, eventually there is no one left who holds long-term
11 memory of the process, the group's history. The result is "brain drain" for the
12 organization. Therefore, human long-term memory is undocumented, and does not
13 become an organizational asset until after it is harvested and crafted into a knowledge
14 asset.

15 Knowledge harvesting work is equally focused on capturing support
16 information, signals and guidance. This focus coincides with the probability that new
17 performers have not been placed in the deficient work area; thus, the most extensive
18 set of information is needed. Brain Drain is similar to the productivity scenario. It is
19 necessary to determine if the work should be done; as well as, determine the
20 appropriate time to move from the baseline to the expected performance level. In
21 addition, the ROI for a brain drain-orientation project is estimated at a ratio of 10:1.

22

Revenue

Revenue has been defined as yielding a return on investment. It is the return produced by a particular source. The company must generate additional revenue by creating new products that leverage and integrate the product's functional uses and the customer's requirements. Organizations attempt to differentiate their product/service in the marketplace by packaging and deploying it to their customers. The most common question to be answered by this type of project, "Where is the cash flow of the organization generated?" In a revenue-oriented knowledge retention project, the answer is knowledge. Thus, the organization is faced with how to externalize the knowledge and embed it into the new products.

A revenue-oriented knowledge retention project is one that applies Knowledge Harvesting as the means to capture know-how that will be used in a commercial information product, intellectual property, or a new product in which its major attribute is the embedded guidance. Revenue-oriented knowledge retention project managers strive to achieve the same goal of differentiating products and adding value by packaging and deploying their captured knowledge and process to their customers. The purpose of this orientation is to increase sales, while creating a new source of revenue. Usually, this happens in the context of product development. As a result of Knowledge Harvesting, a next-generation product using codified know-how as the foundation for differentiation will be produced and can best be illustrated in software. For example, between 1993 and 1996, the American Society for Quality Control (now named, American Society for Quality) partnered with LearnerFirst to produce a series of

1 orientated projects seek to enhance outputs from several inter-related processes and
2 thereby promote the growth of the business. The purpose of the project is to create a
3 model that captures the dynamics of a plant, organization, or significant sub-
4 organization. In the optimization-oriented project, knowledge harvesting work is
5 focused on eliciting signals as well as level-two and level-three guidance. The ROI on
6 this scenario is estimated as a ratio of 12:1.

7 **Agility/Adaptability/Innovation**

8 In this orientation, three components must be considered: agility, adaptability, and
9 innovation. Agility can be defined as being quick or alert, such as an agile mind;
10 adaptability is the ability to change or be changed to fit the circumstances; and
11 innovation is the act of introducing something new. Therefore, this orientation can be
12 characterized as changing quickly to fit the marketplace, while introducing a new
13 product or process. Stakeholders must gain a coherent grasp of the dynamics of rapid
14 changes in the marketplace. Thus, the primary goal may be to create new forms of
15 work, while establishing competitive positioning and marketplace awareness through
16 organizational leadership.

17 An agility/adaptability/innovation orientation project is one that creates a new
18 process by studying and capturing rapidly changing relevant knowledge. The purpose
19 of this project is to achieve an organizationally significant new approach for fulfilling
20 customer needs or managing the business. Cultural adaptation and change
21 management is required to effectively implement this type of orientation project. In the
22 agility/adaptability/innovation-oriented project, knowledge harvesting work is focused on
23 eliciting signals as well as level-two guidance. The ROI on this scenario is difficult to

1 estimate, because the project may be extremely successful with the potential of 100:1
2 ROI, or may be a failure with a loss. Therefore, we report the estimated ratio as being
3 greater than 12:1, with exceptions as stated above.

4 It is possible to quantify, qualify and prioritize the ways KM contributes to the
5 bottom line. We suggest that the persons responsible for KM select an appropriate
6 orientation to capture the key processes and potential ROI of the retention project.

7 **ORIENTATION/SCENARIO CASE EXAMPLES**

8 The combination of the harvesting process and the best orientation method can
9 significantly reduce time and result in improved performance. Real-world cases, from
10 an international forest products company, are presented to illustrate the application
11 approach of the six orientations.

12 **Credit Management Case**

13 In 1999, the forest products company experienced the loss of a senior manager
14 (expert) in the area of delinquency and bad debt management. Due to a serious illness,
15 the manager notified the company that he would be seeking medial treatment and
16 would be leaving in two weeks. The company realized immediately that they had a
17 critical need to capture the expertise of the manager. Two knowledge harvesters
18 gathered information on the financial collection process over a six-week period,
19 including follow-up interviews with the expert after his departure. During the knowledge
20 harvesting process, the knowledge harvesters discovered that the loss of this valuable
21 employee had the potential to negatively impact the efficiency and effectiveness of the
22 department, which is indicative of the risk mitigation, “brain drain” orientation scenario.

1 primary characteristic of this project, enhance operational efficiency and diminish cost
2 per transaction, indicated that it was an efficiency orientation scenario.

3 The deliverable captured the expertise from the technical expert and developed
4 an interactive tool around the key decisions relating to the call center, eGain. The
5 estimated cost of developing the project was approximately \$12,000 with a recognized
6 benefit of \$41,000. The total estimated benefit over a three-year timeframe is
7 approximately \$124,000, with a net present value of approximately \$89,000. Therefore,
8 the return on investment of this project was reported as approximately 6:1. The
9 efficiency gains from this project would include transferring 60% of the work from a high-
10 cost employee to a lower-cost employee.

11 **Data Reference Library Case**

12 The company was challenged with maintaining and supporting an increasingly
13 critical portfolio management tool with two technical experts. At best they would be
14 faced with a decreasing capacity to add critically needed functionality to a growing
15 information technology management tool. At worst, they could lose all ability to
16 maintain the system as it stands today. Therefore, they have a critical need to capture
17 the expertise of the Senior Systems Analyst supporting the system. The knowledge
18 harvesting process indicated that this case was an efficiency orientation scenario. The
19 business result of harvesting the expert's knowledge provided a single source for
20 troubleshooting the IT portfolio management tool, Focus.

21 The deliverable captured the expertise from the Senior Systems Analyst and
22 developed an interactive tool around the key decisions relating to troubleshooting the
23 Focus tool. The estimated cost of developing the project was approximately \$13,000

1 with a recognized benefit of \$69,000. The total estimated benefit over a three-year
2 timeframe is approximately \$207,000, with a net present value of approximately
3 \$156,000. Therefore, the return on investment of this project was reported at a greater
4 than expected ratio of 10:1. Since the expert quickly adapted to the harvesting process,
5 it took less time for the harvester to capture his valuable information; hence, reducing
6 the time and cost required for the harvesting process.

7 **Troubleshooting Case**

8 Currently, one of the manufacturing plants spends a substantial amount of time
9 training shop personnel how to troubleshoot their Thermoforming process.
10 Troubleshooting expertise is distributed among a few process experts with no single
11 view of the process available. The plant is interested in developing an expert system
12 not only to solve problems with the thermoforming process, but also to be leveraged
13 across other Thermoforming process facilities. The knowledge harvesting process
14 indicates that this case is a productivity orientation scenario. The expected business
15 result of harvesting the expert's knowledge will provide a single source of
16 troubleshooting expertise for the Thermoforming process.

17 The short-term deliverable was an initial evaluation of the process to determine
18 feasibility, scope, and broad requirements for an initial project to capture select
19 Thermoforming expertise and distribute the expertise using eGain as the engine. The
20 expected long-term deliverable is to engage a project to capture expertise, train
21 individuals at the facility to "harvest" knowledge, deploy the expertise to the production
22 floor, evaluate/enhance the effectiveness, and establish a plan to continually
23 renew/refresh expertise. The estimated cost of developing the project is approximately

1 \$64,000, with a recognized benefit of \$200,000. The total estimated benefit over a
2 three-year timeframe is approximately \$1 million, with a net present value of
3 approximately \$734,000. Therefore, the expected return on investment of this project
4 was reported as approximately 10:1. If this prototype proves to be successful, the
5 company will implement this process across four additional plants.

6 In the credit management case, the firm was forewarned of the imminent
7 departure of one of its key individuals. The firm recognized the importance of capturing
8 his intimate knowledge of a critical process and proceeded to work through the parts of
9 the knowledge harvesting process. The success of the credit management project set
10 the precedence to capture more valuable knowledge as illustrated in the other three
11 cases. This type of procedure allows firms to build survival capabilities for the potential
12 loss of knowledge, while measuring the return on investment of the project.

13 **FUTURE RESEARCH AND LIMITATIONS**

14 While this study used “real-world” case studies, it is limited to one company’s
15 perspective; however, the proposed methodology was developed based upon the
16 experience of two knowledge-harvesting experts. Therefore, the study appears to
17 provide evidence that could be used for generalization of the findings. Currently, other
18 companies are adopting this methodology, which will be reported in future research.
19 This future research will provide a solid foundation for comparing and contrasting
20 different types of projects with differing ROI results across organizations and industries.

21 In addition, an important research area that needs investigation is an established
22 pre-measurement baseline, intervention, post-measurement methodology. This
23 methodology coupled with the ROI orientation methodology will provide companies with

1 feedback concerning the success of their knowledge retention projects.

2 **DISCUSSION AND IMPLICATIONS**

3 Our primary objective with this paper was to present a methodology that will
4 assist organizations in determining their return on investment in knowledge retention
5 projects, by focusing their efforts on the problem of measuring productivity of knowledge
6 workers, while defining the best orientation for the project, resulting in an accurate
7 return on investment measurement. As the ROI of knowledge retention projects,
8 demonstrated in the case studies, are applied, stakeholders will have a basis for
9 comparison such that differing types of projects can be compared and contrasted.
10 Overall, there was evidence that selecting the orientation that best fits the proposed
11 project will provide an approximate return on investment; thus, providing valuable
12 information to the manager making the decision to initiate the project.

13 As represented in these cases, the goal was to produce a dependable, credible
14 explanation of the bottom-line impact of knowledge retention projects. The value of
15 information in a knowledge asset is a function of its capacity to aid the target learner's
16 understanding toward consequential results; hence, this value has some economic
17 benefit.

18 **Implications**

19
20 The implications of this study are noteworthy for today's organizations. As
21 illustrated in the case studies, companies realize the value of their intellectual assets;
22 however, they require specific financial reporting methods to communicate the value of
23 knowledge retention projects. Due to the impact of the current economic conditions,
24 businesses continue to be "squeezed" relative to financial and personnel resources.

1 Allocating resources and approving budgets has proven to be more difficult; therefore,
2 managers need a methodology that allows them to effectively measure different types of
3 projects with different returns on investment. This study can support management's
4 requirements to have a method of measurement that is tangible and shows results that
5 are verifiable and "real".

6 KM continues to evolve as a pivotal task for companies trying to survive in
7 today's competitive marketplace; however, many companies have yet to realize value or
8 gain returns from their investments in managing knowledge (Desouza, 2003). It has
9 become evident that organizations need to manage their valuable corporate knowledge
10 from a practical standpoint. Thus, properly selecting an appropriate orientation method
11 to support the knowledge retention project effort can contribute to successfully
12 measuring ROI and to the competitive advantage of the company.

13 **CONCLUSION**

14 Knowledge Management has been a popular concept for several years; however,
15 conflicting definitions and controversies about the scope, content, and measurement still
16 cloud the issues. In this regard, we believe that the scope and measurement issues
17 may be clarified by the delineation of measuring the return on investment of knowledge
18 retention projects. Leaders of all KM initiative must eventually face the challenge of
19 proving the economic value of their efforts and results; however, there is not an agreed
20 right or wrong way to evaluate a knowledge retention project and calculate the return on
21 investment (ROI). As demonstrated in this study, knowledge retention project
22 development is difficult to quantify. By asking some simple questions, stakeholders can

1 go a long way in developing the business case to persuade their organization to invest
2 in their people, and not just see KM initiatives as an expense.

3 Until such time as solid ROI measures applicable to KM are developed, the
4 proliferation of KM as an essential component of a manager's toolkit will languish.

5 Researchers must vigorously pursue investigations that will help develop sound and
6 adequate measures of KM success within organizational context, if the true potential of
7 KM is to be realized. This research is an important step in the direction of developing
8 such measures. The degradation of valuable knowledge resulting from personnel
9 losses, employee defections, and unavailability of needed expertise at the right time and
10 place is inevitable; realizing the value of effectively capturing and disseminating tacit
11 knowledge is a necessity; and the strategic application of determining the best project
12 orientation is essential in assuring organizations that money invested in knowledge
13 retention projects will have a positive outcome on the company's bottom-line.

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Figure 1: Organizational Improvement and Knowledge Retention Projects

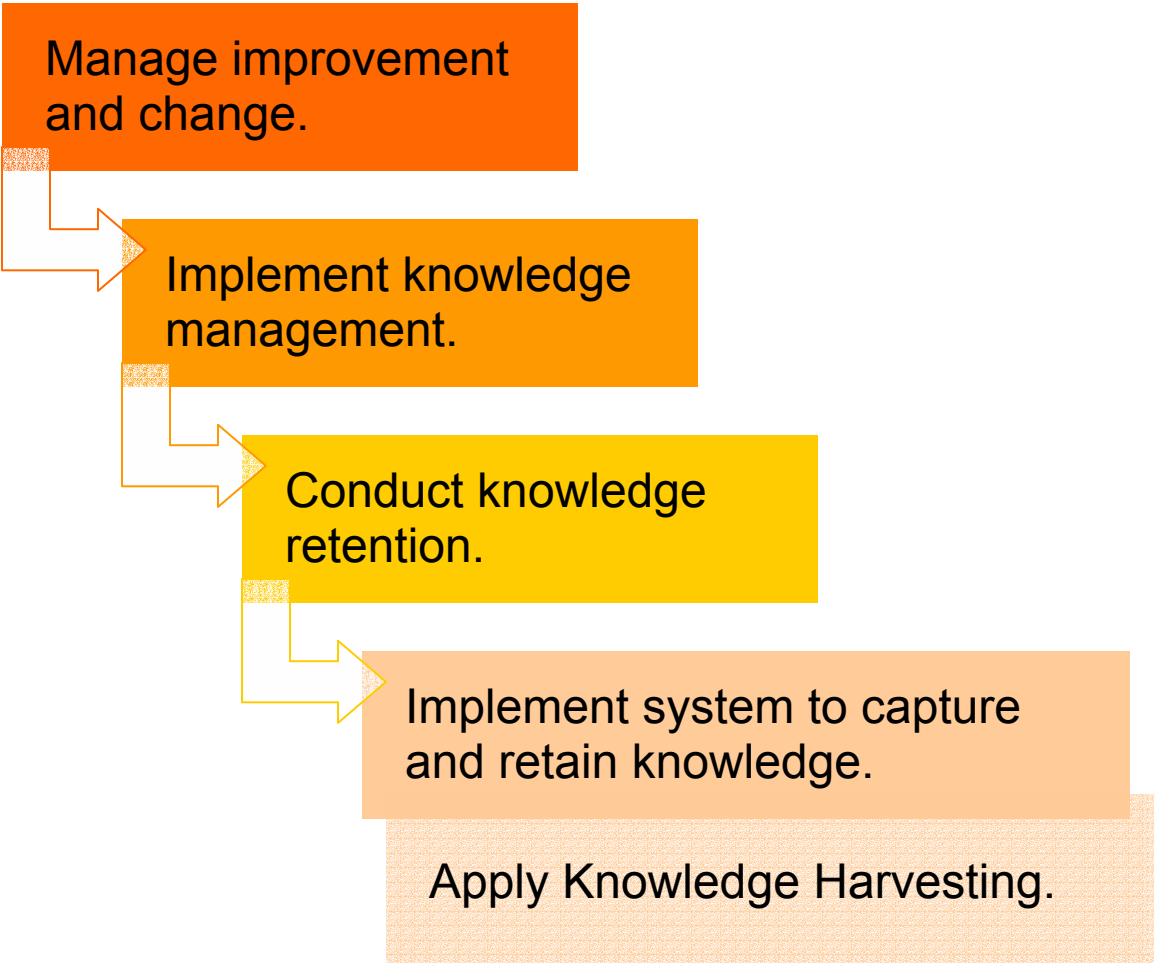


Figure 2 – Knowledge Harvesting Framework

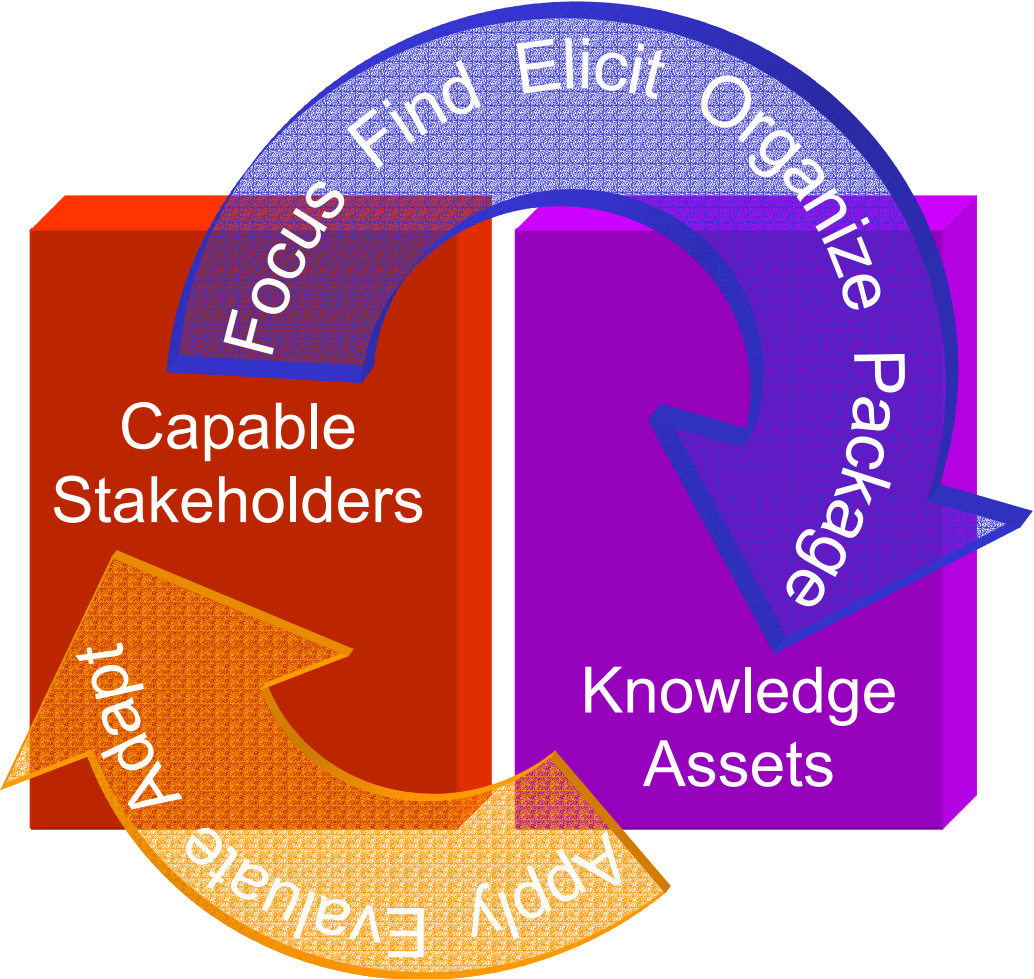


Figure 3 – Knowledge Retention Projects Documentation

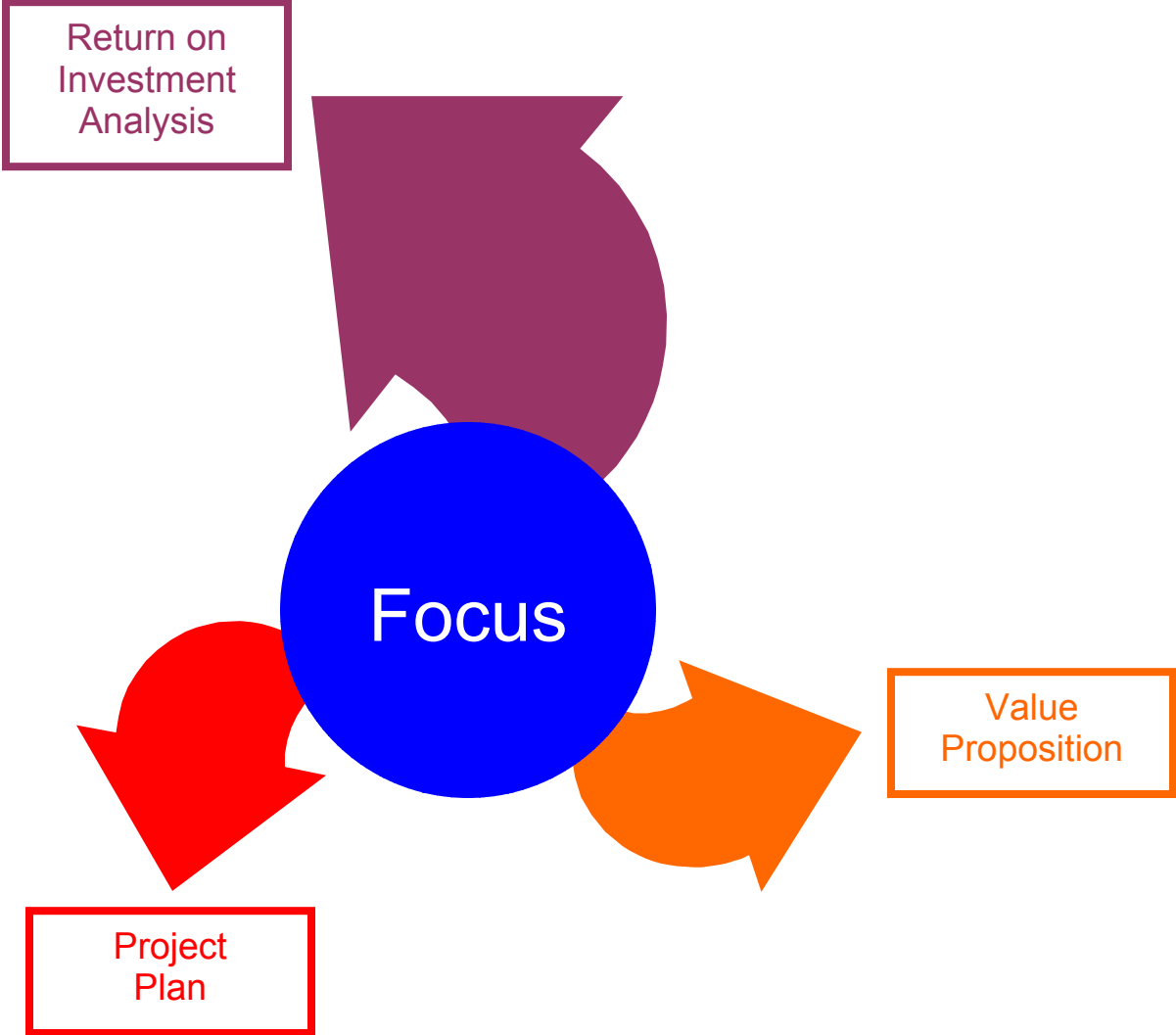


Figure 4 - Stages of Return on Investment (ROI) Analysis

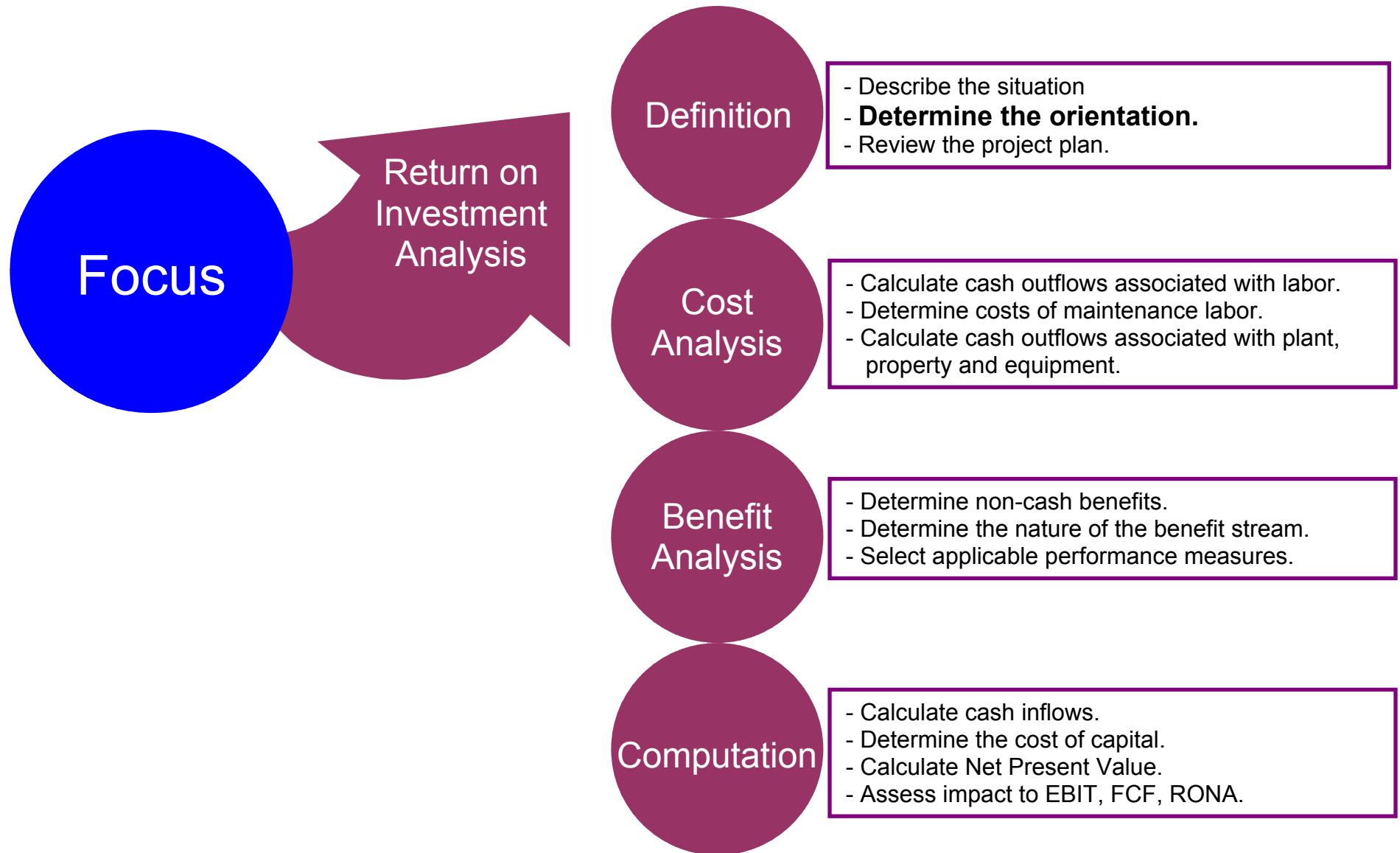


Table 1 Orientations^a

Orientations	Definition	Purpose	Examples	Approx. ROI
Efficiency	Yields the same amount of work at less cost and less time	Move work from high-cost group to low-cost group. Intent is to enhance operational efficiency and diminish cost per transaction	<ul style="list-style-type: none"> - Processing customer orders. - Converting resources or inputs into products. - Making delivery of products or services. - Managing inventories. - Billing the customer. - Providing after-sales service. - Delivering service to the customer. - Processing finance and accounting transactions. - Managing facilities and network operations. - Reporting information. - Managing physical resources. - Managing the tax function. - Ensuring compliance with regulations. 	6:1
Productivity	Yields same amount of effort with more work results.	Improve overall average of productivity and facilitate knowledge transfer to extend abilities of target learners.	<ul style="list-style-type: none"> - Monitoring the external environment. - Marketing products or services to relevant customer segments. - Planning for and acquiring necessary resources or inputs for manufacturing. - Developing human resources skills. - Developing and training employees. - Managing employee performance, reward, and recognition. - Developing and deploying enterprise support systems for information resources. - Deploying strategy to the work level. - Implementing systems security and controls. - Managing information storage and retrieval. - Managing information services. - Evaluating and auditing information quality. - Managing financial resources. - Managing external relationships. 	10:1
Risk Mitigation “Brain Drain”	Gradual depletion or complete loss of valuable knowledge that is essential to the success of the organization.	Sustain the current level of productivity and mitigate any risks associated with employee migration.	<ul style="list-style-type: none"> - Monitoring the external environment. - Marketing products or services to relevant customer segments. - Planning for and acquiring necessary resources or inputs for manufacturing. - Developing human resources skills. - Developing and training employees. - Managing employee performance, reward, and recognition. - Developing and deploying enterprise support systems for information resources. - Deploying strategy to the work level. - Implementing systems security and controls. - Managing information storage and retrieval. - Managing information services. - Evaluating and auditing information quality. - Managing financial resources. - Managing external relationships. 	10:1

Table 1 Orientations^a continued

Orientations	Definition	Purpose	Examples	Approx. ROI
Revenue	Applies KH as the means to capture know-how that will be used in commercial information product, intellectual property, or a new product.	Increase sales – to create a new source of revenue.	<ul style="list-style-type: none"> - Determining customer needs and wants. - Developing new product/service concept and plans. - Designing, building, and evaluating prototype products or services. - Refining existing products/services. 	12:1
Optimization	Yields a process that provides positive outcomes, while promoting the growth of the business.	Create a model that captures the dynamics of a plant, organization, or significance sub-organization.	<ul style="list-style-type: none"> - Any one of these work processes may be the focal point for an optimization-oriented. - Knowledge Harvesting project. - Determining customer needs and wants. - Designing the organizational structure and relationships between organizational units. - Developing and setting organizational goals. - Marketing products or services to relevant customer segments. - Creating human resource strategies. - Planning for information resource management. - Formulating environmental management strategy. - Measuring organization performance. - Improving processes and systems. 	12:1
Agility/ Adaptability/ Innovation	Yields a new process by studying and capturing rapidly changing relevant knowledge.	Achieve an organizationally significant new approach for fulfilling customer needs or managing the business.	<ul style="list-style-type: none"> - Defining the business concept and organizational strategy. - Developing new product/service concept and plans. - Selecting relevant markets. - Creating human resource strategies. 	> 12:1

^aEach orientation is defined as an example of APQC process framework.

Table 2 – Knowledge Harvesting Work

	Efficiency	Productivity	Risk Mitigation “Brain Drain”	<u>Revenue</u>	Optimization	Agility/ Adaptability /Innovation
Is the focus well-defined or might it change?	Yes	Yes	Usually, yes.	Usually, yes.	Focus may change	Focus may change.
What is the extent of existing documentation?	Process documentation	Some process documentation	Some or none	Some or none	Usually, none.	None.
Are contributors easily identified and recruited or difficult to find and engage?	Contributors are easily identified and recruited.	Contributors are easily identified and recruited.	Contributors may be easily identified and recruited.	Usually, contributors are easily identified and recruited.	Usually, contributors are easily identified but challenging to recruit.	Usually, contributors are easily identified but challenging to recruit.
How many people will use the packaged knowledge asset?	Many	Some	Some	Some	Few	Few
What is the variability of ROI?	2	2	3	4.5	5	6
What is the extent of startup work?	Fast and easy	Quick, easy.	Some	Some	Variable due to complexity	Variable due to complexity
What is extent of secondary sources of useful information?	Readily available	Available	Usually, available	Some	Few	Usually, none
What should be the pace (timing of Knowledge Harvesting sessions)?	Rapid, in succession over days	Periodically planned over weeks	Periodically planned over weeks	Periodically planned over weeks	Periodically planned over weeks or months	Periodically planned over weeks or months
What type of information should be captured?	Equal emphasis on support information, level three guidance and level four guidance	Equal emphasis on support information, level two guidance and level three guidance	Equal emphasis on support information, level two guidance and level three guidance	Equal emphasis on support information, level two guidance and level three guidance	Signals, level two guidance, level three guidance	Signals, level two guidance
What is the estimated life time of the produced knowledge asset (until time that some adaptation is warranted)?	24 – 36	24 months	24 months	12 – 24 months	36 months	36 months