Connecting Global Performance Support: A Horizontal and Vertical Performance Analysis for a Sustainable Training and Development Support Network within a Global Multinational Enterprise

by

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ABSTRACT

Global business operations require talented, engaged individual contributors in order to maintain, sustain, and innovate business-valued processes. Tools and systems of operational quality must be defined, refined, and operationalized through nucleic diffusion across the web of social organizational interactions. The progressive human resource development (HRD) practitioners working with business value in mind must provide frameworks of actionable research that engage and motivate all individual contributors towards the goal of employee development and organizational success.

The tools and people systems of modern HRD must be developed collaboratively to provide the means for sustainable outcomes that impact both the individual contributors and provide meaningful and purposeful work for those involved in supporting the development of the individual contributors. Current digital technologies and systems provide the common work areas where the collaboration can occur in real-time regardless of the global location. If work is

to be performed in these systems at all times in all locations across the global enterprise, people systems need to be developed and cultured with sustainability in mind and will need to include such characteristics as validated norms, mutually accepted expectations, and performance feedback mechanisms.

This case study presents the action-oriented framework for comprehensive performance analysis used to develop world-class performance support through the sciences of human and organization development.

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Chapter I: Introduction

Sustainable outcomes from workgroup interaction rely on actionable plans to move theories into practice in the environment of business operations. This research presents a practical response to the needs of improving both training and development support personnel service outcomes and those stakeholders whom rely on the resulting increase in human systems capabilities to continue business operations. This first chapter identifies the problems, explains the significance, details the critical assumptions, and defines the general terms of associated with distributed workforce expectations and outcomes. The last section of this chapter includes a brief overview of the methodology used.

To bring context to this research, a problem needs to be identified, solutions set, and clarity brought to terms in the form of a solid set of progressive HRD objectives to be measured. Without formalizing workgroup expectations and norms, efficiencies can be realized. Without action plans that deliver sustainable outcomes, the HRD practitioner realizes significant organizational and individual contributor resistance to changing ingrained work systems. Further understandings of the assumptions that carry into the operating environment provide insight into actual pressures into the HRD support environment.

Further in this first chapter, a foundational presentation of basic terms and definitions provides additional understanding of both core terms and and their associated peripheral definitions. Lastly, a general methodology explanation provides structure over time comprehension of this actionable research.

Statement of the Problem

Global business operations, based on stateside manufacturing and distant sales and service operations, present a wide range of operational support pressures on both the regionally

based individual contributors - those performing the local work, and the centrally located core human resource development function - those that provide developmental support to the individual contributors.

Purpose of the Study

The goal of this research provides a HRD operations framework called the Impact Map for all company based human resource development operations involved in a specific program called the Skills Management System (SMS) Pilot. The Impact Map will follow the phase progression detailed in Table 1. These four phases are the current macro level model being used to approach the skills deficiencies of a service workgroup identified in a Human Capital Capability audit conducted in 2004. Table 1 details the organization capability development model from which the Impact Map will be built upon as a result of this research. In short, greater detail of the unknown organizational performance process details required for sustainable HRD will be explored through action research techniques.

Table 1

Organization Capability Building Model

Phase 1	**Phase 2**	**Phase 3**	**Phase 4**
Assess Knowledge/Skill (Capability)	Build Knowledge/Skill (Capability)	Practice Knowledge/Skill (Capability)	Evaluate Knowledge/Skill (Capability)

Conceptually the Impact Map resides inside one cell of the holistic structure created by the connection of the (a) horizontal organization development requirements of: (1) Analyze, (2) Design, (3) Behaviors, and (4) Outcomes, and (b) the vertical workforce groups affected by the scope of the SMS Pilot. This resulting structure provides a focusing framework for applying the numerous techniques, methods and other organizational improvement processes required for maintaining operational success through engagement, alignment, and agreement within the larger HRD strategies. The cell labeled as *HRb* in Table 2 identifies the specific focus of this research. The research focus will not report on the other organizational responses associated with the larger SMS Pilot occurring in the remaining cells of Table 2.

Table 2

Horizontal and Vertical Matrix of Organization Development

	Analyze	**Design**	**Behaviors**	**Outcomes**
Sponsor	SPa	SPd	SPb	SPo
Manager	MAa	MAd	MAb	MAo
Supervisor	SUa	SUd	SUb	SUo
HRD Support	HRa	HRd	HRb	HRo
Individual Contributor	ICa	ICd	ICb	ICo

Once complete, the Impact Map will provide organization stakeholders with a performance roadmap containing the interconnected processes, related tasks, and associated steps for sustaining the key HRD support processes beyond the SMS pilot.

The individual contributor roles, responsibilities, and performance expectations of the HRD support workgroup will be developed through the combination sciences of Performance Analysis, applied Action Research techniques and Organization Development principles. In final form the Impact Map will be further sustained through a global community of practice that will be formally formed and enabled through groupware-based communication technologies as part of this formal action research. In short, human resources efficiencies will be discovered and regional organization capability will be improved to support individual contributors engaged in the development activities of other workgroups.

Because the future of the HRD department process formalization depends on capability building through the prescriptive organization development activities presented in the Methods section of this research, the final form of this Impact Map must be conceptually presented from a known form shown in Figure 1 with the understanding that final form will be the result of organization learning and combined distributed cognition.

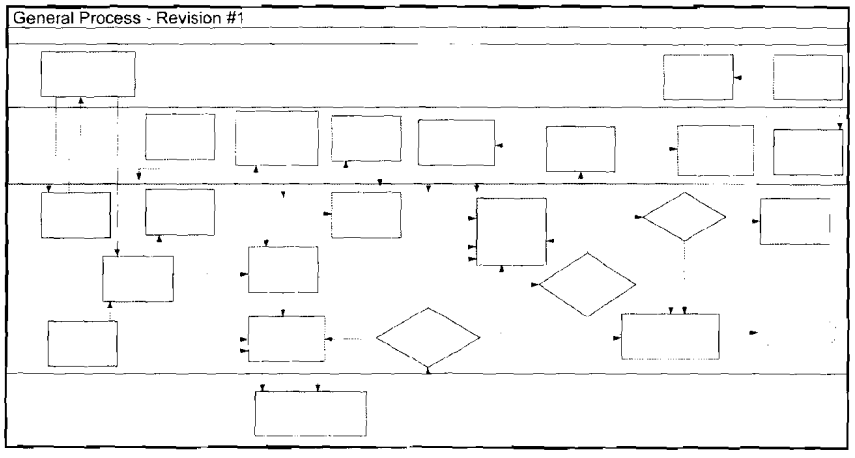

Figure 1. Typical/general process.

Objectives of the Study

This analysis will address the following objectives:

1. Define the horizontal impact of process lag.
2. Determine adjacent HRD processes for specific vertical organizational hierarchies.
3. Determine Process Handoffs mechanisms.
4. Evaluate key Project Management methods across time and distance.
5. Evaluate Process Structures and Work breakdown Structures.
6. Assess evolving HRD Support Staff Roles, Responsibilities, and Expectations.
7. Define key integration processes for Learning Technologies.
8. Develop HRD Process awareness.
9. Gauge the impact of both downstream and upstream process characteristics.
10. Develop the capacity of the individual contributor assigned to the HRD function to add Value-Added efficiencies.
11. Define HRD Process Feedback mechanisms
12. Measure critical perspectives within the HRD support function.
13. Define diffusion of innovation bottlenecks.

Significance of the Study

This research provides comprehensive, detailed, and scientific application within the larger HRD function. The action research details of this specific application provide insight into social challenges and ramifications of developing HRD interventions that stay relevant beyond initial rollout. The performance analysis details of this research provide balancing legitimacy to the complex understanding of individual contributor roles, expectations, and details of competent performance. With the need to bring pertinent effective HRD processes into realization within

the global requirements, this action strategy for capability building leverages the dual aspects of organization development at the tactical operations level and the critical, detailed view of performance analysis to bear on the dynamics of interdependency. To remain valid the HRD function must extend and apply with the available mix of human development sciences.

Assumptions of the Study

The organization under study has been through a series of strategic human resource development actions that include a Human Capital Capability Audit (HCCA), training and development department realignments at the regional level, initial technical courses and leadership development program offerings, and the configuration and implementation of a globally accessible Learning Management System (LMS). Operational budget has increased twenty-seven percent (Swiderski, 2007) in the last four years as a result of these larger HRD strategies. This multinational company's training and development function has made further strategic HRD plans with additional funding that drive this implementation of the Skills Management System (SMS) pilot.

Three data/information-sharing services make up the technology backbone of this action research. The first two platforms are Information and Communication Technologies (ICT) services. The first is a web-based file and personal computer application sharing platform called Webex and the second is a tele-audio conferencing platform called Sprint Teleconference. The third service is the Learning Management System (LMS) that will be the focus application where all HRD support staff will administrate the SMS. All three services are organizational tools that have yet to be functionally measured for effectiveness or efficiency. All three information services have been budgeted and will be core to all ongoing research activities.

Definition of Terms

Boundary Object - intentional objects documents, prototypes, phase gates of process.

Bridging – a knowledge worker service, provided by people who can span practices and speak multiple languages at the same time.

Communities of Practice - a process of learning through participation and social exchange.

Intellectual Capital – the sum of human capital, organizational capital and customer capital, where customer capital reflects the perception of value that the customer gets from transacting business with the organization.

Impact Map - A diagrammatic representation of the interconnected value-added business processes used as a point of common reference. Used as both a diagnostic tool as well as an innovation springboard.

Information and communication technologies (ICT) –electro-physical systems providing the means for information transfer. Includes all ground, air, space based distribution systems that includes both analog and digital encoding and quality of transfer management. Often includes internet-based aspects.

Internationalization - A "mean(s) of adapting products such as publications, hardware or software for non-native environments, especially other nations and cultures." (downloaded from *http://en.wikipedia.org/wiki/Internationalization_and_localization)*

Learning Management System (LMS) – an Internet accessible relational database used to maintain employees training and development records and assign resources related to training and development. Also serves as a feedback channel for knowledge assessments and as a push technologies platform capable of streaming pertinent media rich learning content to individual contributors.

Learning Plan – A list of actionable learning events or activities. Can be any learning activity to include: Information, Experiential, etc. A formalized list of learning that should be complete in by an individual contributor in an assigned role within a corporate function. Used as a segmented grouping within the LMS.

Legitimate Peripheral Participation - the process of en-culturing newcomers or novices to adopt the knowledge and skills needed in the community by participating in the actual practice of an expert but only with limited responsibility.

Skills Management System - a relational database functionally connected to the LMS. Used to maintain skills-level and task-level qualifications, certifications, and competencies

Limitations of the Study

The anticipated length of the corporate SMS pilot project will exceed the horizon for this research project requirement and will limit the scope of this research report. A final SMS pilot report is due in December 2007 and will be reviewed by the corporate level sponsors. As the Impact Map deliverable is the end to the means presented in this research, there certainly are enough organizational data points contained within the scope of this research to continue and present findings.

In the wake of the widespread diffusion of internet-leveraged digital services, individual contributor's tool and skill asset have yet to be realized. Knowing why and how to use these services has been a long-term barrier to effective and efficient global operations. The distributed cognition experiences realized through ICT technologies and the process driven characteristics of the LMS are both formidable challenges to the unfamiliar operations that reach globally into the value-added expectations.

As trends of business process wax then wane through the churning of personnel, the organization the responds either reactively or proactively to the complex human resource needs. Although the strength and breadth of the HRD leadership for this corporation has increased in the last two years, a hysteresis effect of the new strategic HRD direction has yet to fully align and diffuse through to the service workgroup identified in the HCCA.

Methodology

The strategy for completing this study will proceed by engaging the workgroup associated directly to the HRb level defined in Figure 2. The expected timeline for the entire HRb engagement will be approximately one calendar month to allow for organizational and individual processing and group validation. Since the data collected is action research in nature, the posting of the data will occur within the context of learning about data and information processing and organizational improvement. This action data will be analyzed, evaluated and then distributed to those immediately involved with the SMS Pilot for use in determining the proper team information-based decisions. A data handling strategy will be used to retain raw and manipulated data for the purpose of post-decision review. This capability-building event will be scheduled to occur over a period of two months, therefore data collection requires adherence to systematic handling techniques.

Refer to Table 14 for the data collection (DC*x)* numeric assignments. Project Management techniques will be used to schedule all resources, events, and activities. The Learning Management System will be used to through out the sequence of events and activities. The LMS Groups and Curriculums functionality will be used to administrate the Learning Plans to each individual HRD support team member. The Content Object feature will be used to distribute pre-reading material as well as the five data collection (DC*x*) activities. The LMS Registration and Closeout feature will be used throughout to set rosters and verify actual attendance in the capability building events. The robust Crystal Reports database analysis application will be used to extract the data points.

Chapter II: Literature Review

The movement towards effective and efficient HRD support processes requires broad examination of adult learning and development sciences. A set of relevant themes, or examination frames, to key to the problem statement are presented in form, discussed in analysis, and applied to the business unit under research consideration. Initial meta-data sorting and sequencing of literature for review reveals result in the following research frames: Examining an organization through these frames provides a holistic, contextual understanding of the environment where the change opportunities present challenges. In the initial research article review and evaluation, a formalized examination consisting of sorting and sequencing against the problem statement and research objectives discovered the following literature review frames: foundational organizational learning theories, social and technical work systems, individual HRD change agent qualities, current learning technologies, and the needs of connecting HRD to business valued outcomes.

Foundational organizational learning theories leads the focus of this review at this meta-level of understanding the extent of working with development and learning of the human capital collective in organizations. Examining social and technical work systems provides insight into how individuals and groups use tools to solve problems and exchange for meaning in complex communication. Reviewing individual HRD change agent qualities defines the internal knowledge, behaviors, and competencies relating to facilitating change on groups of people. Reviewing current learning technologies provides an environmental and technical overview of leading physical systems used in enabling workgroups to learn from others regardless of extended locations.

Foundational organizational learning theories provides the collective of the organization with an operational mindset, or thought plan from which the long-term organization can plan for success in overcoming challenges and solutions to problems encountered in the environment. Organizational learning adds extending complexities beyond the facets of individual contributor learning requirements. Dirrkx (1997) provides a contextual opening for organizations seeking progressive improvement by suggesting:

> the move to a learning organization perspective involves a paradigmatic shift in how we think about work, learning at work, and the role of the organization in this learning. It requires us to let go of the technical-rational views of learning and work that have dominated workplace learning for so long and embrace a contextual and constructivist understanding of work and organizational learning. (p. 74)

This change in approach towards learning brings realistic promise of meaningful engagement for all members of the learning organization through examined development resulting in formal participatory events and informal assignments that both add value to the individual contributor skill set, proximal workgroup processes, and business outcomes.

Aygris and Schön (1974) provide further strategic organizational learning guidance by challenging:

> organizations to recognize the limitations of single-loop learning - familiar from the quality movement, which fosters the ability to detect and correct errors within the frame of current assumptions and policies, and to aspire instead to double-loop learning - the ability to detect, determine, and perhaps even modify the organization's underlying norms, policies, and objectives. (p. 2)

The implied responsibility of Dirkx's, Aygris and Schon's recommendations indicate that the HRD function must realize, extend, plan, and measure results as HRD opportunities and solutions are brought to sustain the workforce populations.

Socio-Technical Systems

Brown and Gray (2003) draw organizations closer to the value added engagement by suggesting: "the real genius of organizations is the informal, impromptu, often inspired ways that real people solve real problems in ways that formal processes can't anticipate when you're competing on knowledge, the name of the game is improvisation, not rote standardization" (p. 4). By purposefully engaging individual contributors and groups in both formal training and strategically designed organizational development initiatives, Vance (2006) asserts "that competitive advantage can be achieved and sustained by linking company-level business objectives and strategies with individual employee goals and performance" (p.39).

In review of these organizational learning theories and strategies of practice, an alignment and engagement mechanism is born that creates the opportunity for what Aygris and Schon (1974) call "accommodation – altering one's frame of reference or basic assumptions about the world" (p. 3) leading the individual contributor towards personal learning and development and a resulting organizational performance for the future of unknown probabilities that are covered by the capability contained within the competence of workforce knowledge, skills, and attitudes.

The complexities of human interaction once confined to local work settings are strained by the extension of the business model well beyond the borders of nations and are amplified by the lack of local understanding in distant support operations. Language differences add further strains to the mix of business requirements. Certainly the physical means for connecting have

been explored, defined, refined and implemented in the most recent advances of information and communication technologies during the last ten years of communication systems diffusion. The well-rounded HRD practitioner should be capable of identifying, navigating, and exerting prescriptive control over both the (a) socio-technical systems created in these internationally extended business models and (b) the myriad of information and communication technologies that are used to deliver data, information, and most recently knowledge.

Bartlett and Ghoshal (2002) bring further focus to the strategic tasks of change by identifying another complex duality encompassing the macro and micro levels of organization development by identifying two competitive and divergent corporate agendas: (a) "achieving global operation integration, synergies, and economies of scale", and (b) while remaining "sensitive and responsive to local business conditions" (p.312). Referring to a similar vertical organizational framework like that found in Figure 2, Vance (2006) identifies the key stakeholders as being in "dynamic tension" with the individual organizational members (p. 38). These divergence issues provides the HRD practitioner further perspective from which solutions can be framed for the benefit of both corporate "upstream" and "downstream" audiences. Eventual sharing and dialog of this upstream and downstream duality with both the key stakeholders and the individual contributors should be used to foster individual awareness and improve group dynamics.

As organizational learning becomes strategically solidified at the decision level of an organization and moves into action strategies, Vance (2006) summarizes that:

> An important step in achieving this common workforce internal alignment is the development, using human resource processes (e.g. through effective training and development activities, communications, work collaboration assignments, and reinforcing

> reward systems), of global leaders throughout the MNE who share common core values, priorities, capabilities, and performance-based expectations; followed by the implementation of congruent performance expectations – with appropriate local adaptation – within the leaders' local business units. (p. 41)

Vance's (2006) suggested processes are the means, and the "core values, priorities, capabilities, and performance-based expectations" provide the organizational pressure for creating, operating, and sustaining quality HRD systems (p. 41). Strategic capable organizational drivers have a responsibility for active, positive engagement with individual contributors in HRD initiatives. A series of operational stakeholder balancing requirements confront the HRD practitioner. Siebold and Lewis (1998) provide downward connection from the strategic initiatives of the organization by offering contextual business partner guidance:

> A change agent's major role in this process (separate from the technical aspects of the change program) is the achievement of a program that reflects, as well as possible, the various needs of the organization's members and the strategic goals of the organization. (p. 245)

Argyris (1994) sums these HRD practitioner expectations to an actionable level by providing "facilitators of change must first change the values and generic action strategies of those entering change" and connects the OD aspects of change to core individual contributor learning strategies (p.33). Argyris seems to connect organizational learning to individual learning and cautions this active extension into double-loop learning can be "considerably harder, (and) implies (that) accommodation – altering one's frame of reference or basic assumptions about the world" are difficult to operationalize unless purposeful action strategies are planned and implemented with learning effectiveness as the goal of quality (p.3) This is a moderate caution

call for a HRD practitioner without highly refined interpersonal communication skills and a proven track record in both adult motivation and psychology domains. An HRD practitioner's capacity must be at a level commensurate to the change impact. Further guidance on individual performance can be realized by in depth understanding of Gilbert's (1978) Behavior Engineering Model (BEM) shown in Table 3.

Table 3

Gilbert's Behavior Engineering Model

Environment	**Personal**
Data	Knowledge
Instruments	Capacity
Incentives	Motive

In light of multi-faceted pressures and requirements for organizational change, Gumm and Hatala (2006) address another duality awareness required by the HRD practitioner and identify the challenge "to provide training that meets the operational needs of the organization while ensuring the individual employee receives personalized training for the purpose of performance improvement and self-fulfillment" (p. 229).

HRD Practitioner Qualities, Tools and Skill Set

Brown and Grey (2003) turn the focus of this research from the larger organizational impacts and challenges towards HRD practitioner action strategies and personal qualities by suggesting that "nuanced knowledge brokers" can span divergence issues by providing "bridging" services that "can span practices and speak multiple languages at the same time" (p.

8). The scope and span of these services include but are not limited to performance management, OD skills, technology, interpersonal effectiveness, systems thinking, and knowledge leadership. A few of these critical-to-success personal factors of the competent HRD practitioner revealed in the research push are identified and discussed.

Performance Management. The HRD practitioner needs theories, tools, and action strategies to carry progressive change into the organization mix of the manager/supervisor workgroups and individual contributor that connect on the vertical of Table 2. With the preceding organizational change theories and change characteristics in mind, the examining lens now shifts from change leader aptitudes to a frame of group attributes. Vance (2006) contributes that "performance management" should be part of the HRD practitioner action strategies for the groups of managers and should be "aimed at enhancing and maintaining employee performance toward the achievement of desired performance objectives" (p. 37). Cowen and Osborne (2002) prescribe a systems approach to holistic performance management and offers four profile characteristics of High Performing Organizations (HPO): (a) Precise Expectations, (b) Measure/Frequent Feedback, (c) Performance is the King, and (d) Truth be told. Using these four HPO characteristics the HRD practitioner's could reframe, guide, and solidify the managerial/supervisor stakeholder group's abilities to "detect, determine, and perhaps even modify the organization's underlying norms, policies, and objectives" (p. 229). Argyris and Schon (1974) collect views as part of the larger change initiatives and organizational alignments. These four characteristics combine as a simple concise performance management system framework that can provide guidance to the manager/supervisor workgroup when interacting with individual contributors on matters related to on the job performance and resulting outcomes.

Cultural Awareness and Sensitivity. Because of the globalization of work teams, sensitivity to local cultural norms and operating expectations needs to be addressed by the HRD practitioner. Gumm and Hatala's (2006) solid research into the organizational practice of workforce development across international boundaries provides five issues listed in Table 4 to deal with and suggests that the HRD practitioner will need to address and provide remedy for the eventual work environment issues and performance roadblocks/misconnects based on cultural differences.

Table 4

Key Cultural Sensitivity Issues

Key Issues
Power distance
Femininity – masculinity
Communication context
Collectivism – individualism
Control orientation

Armed with this knowledge and organizational perspective the HRD practitioner can pre-frame their actions and activities to provide possible compensation strategies for these five issues prior to the actual obstacles and roadblocks encountered in working with both the source and remote workgroups.

Organizational Artifacts. As the HRD practitioner enters into both diagnostic and realignment transactions with the players of an organization, the mechanisms of interaction and effort produce both intended and unintended results within and beyond the targeted workgroups.

Schein (1985) identifies and refers to three results as artifacts, values, and basic assumptions. From a scientific standpoint these three interaction results should be monitored and measured as part of the larger action research collection methodologies. Table 5 contains Schien's three results with clarifying details.

Table 5

Interaction Results

Outcomes	Description
Artifacts	Rites, rituals, and symbols – visible but not always decipherable
Values	Testable in either the physical or social world of the organization – these demonstrate a great level of awareness of the organization's culture
Basic assumptions	Taken for granted, can be invisible or even preconscious

Core to working with adults in the dynamic of workforce development is mastery level understanding of working with adults, and groups of adults. Gilbert's Behavior Engineering Model shown in Table 3 presents the operational model from which dialog and decisions regarding change action in the workplace can be anchored. Even reviewing and assigning this research presented in this paper, the advanced HRD practitioner will realize considerable connections and categorizations inherent with Gilbert's Behavior Engineering Model.

Setting up for Individual Contributor Performance. Transitioning from the larger strategic details of organizational learning into the finer operational details and tactical HRD actions associated with providing relevant developmental opportunities for both the individual

contributor and the groups requires further investigation into the end goal of the larger workforce development enterprise.

These conceptual anchors come in the form of theories and models from the larger science fields of learning and development. Learning theories help the designers of learning environments understand what they are fostering (Hoadley & Kilner, 2005). The HRD practitioner needs a larger learning theory to guide their workforce development activities. Allen, Evans, and Ure (2005) call this a "worldview" and offer constructivism as the larger operational model that will set up the authentic opportunities for success by allowing individual contributors to "construct knowledge as they interact with the world, strive to make sense of their experiences, and seek meaning" in their daily quest for purposeful and engaging work (p. 258). With this larger constructivist model in place, further focusing and refinement within the constructivist model will bring thematic light to the HRD practitioner's approach to engaging individual contributors.

O'Driscoll (2003) suggests the "the goal of workplace learning is to help employees learn and solve problems so that they can perform better on the job" (p.5). Levy and Murnane (2004) identify this problem solving capacity as "identifying and solving uncharted problems" and suggest that individual contributors should continue by engaging in "complex communication" about "conveying not just the information but particular interpretation of the information" in order to add business value (p. 5). With the goals set around increasing problem solving capability and improving communication skills of the individual contributors in place, HRD practitioners will also need to "be careful to distinguish between fostering desired learning from fostering learning indiscriminately" (Hoadley & Kilner, 2005, p. 32). With a this trifecta of learning in place that includes the (a) model of constructivism, the (b) dual themes of problem

solving and complex communication, and (c) guidance to foster desired learning, the HRD practitioner has a solid scientific base to approach the individual contributor's needs and of satisfying HRD opportunities. With the sciences of learning set, the HRD practitioner can turn to designing learning opportunities for groups of people.

Group Performance

In short, a business must develop operational outcomes, either in the form of physical products or knowledge-based services. These outcomes are the result of interconnected processes, made up of discreet stages and detailed finite steps that must be executed in reasonable sequence. By working together in meaningful relationships individual contributors exchange either data, information, or physical material in the organizational quest for marketable outcomes. As human resources churn throughout all levels of the organization resulting in knowledge and skill gaps, the need for HRD action plans and formalized activities becomes more pertinent. Typical HRD events range from formal/informal mentoring, on-the –job training, classical instructor-led classes, and computer-based eLearning. Regardless of what mode of the HRD event, the basic purpose is to transfer knowledge and skill onto the next keeper of the organizational process. Following in the constructivist learning theory, Hoadley and Kilner (2005) offer "knowledge and learning exist as byproducts of social processes such as those that take place in communities of practice" (p. 31). This suggests that knowledge and skills exist as a result of meaningful exchange between people and therefore should be cultured as individual contributors are brought together to solve organizational issues. This implies that Schein's (1985) rites, rituals, roles, expectations, feedback are critical dialog points in the social events that lead to effective building of knowledge and learning capacity within an organization.

Ray and Romano (2005) present four levels of understanding, shown in Table 6 that must occur for effective workgroup performance. These four levels of understanding will need to be overcome by the individual contributors and the larger workgroups collectively in the quest for both individual and organizational learning and development. Of particular interest to the HRD practitioner is what Ray and Romano have included aspects of Gilbert's (1978) Behavior Engineering Model in their research of understanding. Specifically Ray and Romano's first (data) and third (knowledge) level of understanding correspond to opposites sides of the Gilbert's Behavior Engineering Model shown in Table 3.

Table 6

Levels of Understanding

Levels	**Description**
Data	Represented by a mere collection of symbols. At the data level, the organization is at the basic level of collecting data relevant to its business requirements.
Information	The data collected is organized and summarized to find relationships among the data. At the information level, collected data is now being put into context of when and why it was collected and used to generate information that increases an organizations understanding of its business
Knowledge	Knowledge is gained when patterns are discovered in the data. At the Knowledge level the data and information collected over a period of time, when analyzed reveal some kind of recurring patterns in the organization's business processes.
Wisdom	Wisdom lies in understanding the causes and consequences in the patterns found.

Group Collaboration

Further examination of how effective groups collaborate is provided by Hoadley and Kilner (2005) in a dual framework for examining the meta-contextual details of how "knowledge is generated and shared" around a "purposeful conversation centered around content in (authentic) context" (p. 33). As the workgroups reach understanding, Ray and Romano's (2005) research "provides group capability analysis and reveals the in two distinct operational stages called the (a) Level of Understanding and the (b) Level of Collaborative Capability. Extending from the levels of understanding to the levels of collaborative capability, workgroups become a multiplied performance unit and are able to exceed the performance of single individual contributors. Included in Ray and Romano's (2005) research on Intellectual Bandwidth is a set of possible metrics points used to gauge a workgroup's collaboration capability. This possible metric is shown in Table 7 and would be prime for use in collecting individual contributor's perceptions on organizational process maturity. When used in effectively this data point and resulting information would provide solid action research for determining the level of business process performance.

Table 7

Level of Collaborative Capability

Stage	Characteristic
Individual	No collaboration
Collected	All tasks are aggregated at the end
Coordinated	Success of some group members depends on timely completion of tasks by other members
Concerted	All members work in a synchronized manner towards a single goal

Communities of Practice

Workgroups appear, develop, thrive and wane as a natural result of interaction between business opportunities in an organization. Regardless of the formality of the workgroup, the individuals in these groups are reacting – the opportunity to perform - as a result of operational pressures in the environment. Faced with responding in the environment, the individual contributor and workgroups have a set of performance options they could follow: (a) react to produce a physical or mental product or service, or (b) opt out and not perform the physical or mental product or service, or (c) embrace learning about the new opportunity. Those individual contributors and workgroups that are able to respond and do complete the opportunity fulfill the organizational need with some level of beneficial productivity. Those individual contributors and workgroups that are unable to respond require some form of performance management or training/development activity to cover the gaps in organizational capability.

As the dynamics of human resources naturally ebb and flow, new individual contributors enter the organizational workforce and eventually engage with specific workgroups in the flow of opportunities. These workgroups, whether formal or informal, can be identified conceptually as "communities of practice" (Lave & Wegner, 1991). To endure, communities need to replicate themselves by enculturating new members through learning (Hoadley & Kilner, 2005). This suggest that HRD practitioners charged with organization development responsibilities must (a) understand this enculturation dynamic in order to interact with these self-sustaining workgroups without causing harm to the balance of the communities (CoPs) that in-process naturally, and (b) be personally competent in nuances of capability building of CoPs for the future success of workgroups that need to be created for sustainability of the organization.

These CoPs also provide incentive (refer to Gilbert's BEM, Table 3) fulfilling opportunities for individual contributors. Specifically, these CoPs provide the opportunity, or the stage for "developing a professional identity through valued competence at work (Hoadley and Kilner, 2005)". When CoPs sustain, the members are provided the opportunities for building their knowledge and capability (refer to Gilbert's BEM, Table 3) leading to fulfilling the individual contributor's natural yearning for validation of self-worth. The HRD practitioner's capability in sustaining or developing CoPs that support individual contributor's self-worth will realize greater results through applied attention to the details of incentives.

Refocusing this research discussion back onto the learning of workgroups and CoPs, it is Allen, et. al. (2005) that provide further constructivist evidence of understanding by identifying the "five conditions (that) must be met for learning to occur" in the workplace and list in Table 8 (p. 258).

Table 8

Conditions of Learning

Condition	Description
1	Learning must be embedded in complex, realistic, and relevant environments
2	Social negotiation must be provided for as an integral part of learning
3	Multiple perspectives and the use of multiple modes of representation must be supported
4	Learners must be encouraged to own their learning
5	Self-awareness during knowledge construction process should be nurtured

(Driscoll, 2000)

Each condition listed in Table 8 provides HRD practitioner insight, information for use in possible organization development activities with CoPs as they are sustained and/or developed, and a possible measurement data point in action research. By comparing Table 8 to Gilbert's Model (Table 3), Conditions 1 and 2 can be categorized into Gilbert's Environmental domain, Conditions 3 and 4 can be categorized into Gilbert's Personal domain, and Condition 3 contains both Environmental (multiple modes of representation) and Personal (Multiple perspectives) domain characteristics.

As activities in the CoP development are researched, identified, modified for possible use, and eventually implemented, the HRD practitioner should look for broad interconnection to other scientifically valid theories and models. In layman's terms this is seeking the greatest possible "win-win" and only adds to a practitioner's scientific base of support. As these action strategies for CoP development are explored, one possible activity that would engage within the

application workgroup support includes Allen, Evans, and Ure's suggestion to "provide a place where learners can view a situation or problem from multiple perspectives". The cross-theoretical connection, or "win-win" would be back to Senge's (1990) "Wheel of Multiple Perspectives Exercise" that is presented within Senge's five theoretical themes of a learning organization. This multiple perspective exercise can be used to improve both the capability of the CoPs and for practicing interpersonal feedback that lends to culturing a HPO.

Hildreth and Kimble (2005) also provide insight into enculturating new CoP members through legitimate peripheral participation (LLP) and the role LLP takes as workgroups and CoPs engage in solving organizational problems. As members of the workgroup and CoP transition in, there is social structure they must navigate through over time to be considered as a legitimate member. The HRD practitioner will need this knowledge of the social structure to determine possible alternative influencing and persuasion strategies as the CoP actively engage in political interactions while performing in the environment of business operations.

Impact of Internationalization on Human Resource Development

In the global free-market economies of the 21st century, business operations often expand beyond continental boundaries as new markets and resources are sought out in the search for operational efficiencies. Allen, et. al , (2005) found that organizations seek to "gain greater access to and utilise global resources, reduce training costs, provide opportunities for informal training, and increase communication and innovation..." (p. 269). This drive for regionally based cost-efficient operating conditions carries the same financial operating expectations and service outcomes, except with different key organizational players. This will tend to apply extended HRD pressures on the following: (a) resource utilization, (b) communication, and (3) training on activities. Solutions to improving HRD processes are then required to lessen the impact of time

and distance on effective operations. Thune and Well-Stransd's (2005) research into the use of technology tools, specifically ICT in supporting administration, suggests possible positive solutions that tend to lessen the impact on the globally extended processes now realized. work within extended business operations defined that ""ICT and particularly the Internet, is considered to facilitate internationalization due to its ability to overcome space and time boundaries, thus enabling distributed units to work as a "unit in real time" (Castells, 1996 p.101)"". Practical ICT application then becomes the tool of progressive choice for the HRD organization to use in meeting operational demands.

Moving Towards Virtual Communities of Practice

Tools often are sought out to make better the outcomes centered on controlling resources. As business operations expand beyond the physical horizons while the need to support and maintain learning activities in the legitimate virtual environment across vast time and distance continues, the search for effective tools that lessen the effect and impact of distance communication and a problem solving in a team-based dynamic. In recent years the tools found in the ICT category have shown promise and distinct advantages in supporting learning environments across time and space. Refer to Table 9 for Hoadley and Kilner's (2005) "three classes of advantages that technology can provide to learning environments" (p. 35).

Table 9

Learning Advantages

Representational	Information technology provides access to novel representations of information in support of learning
Process	Technology supports or facilitates learner tasks or activities
Social context	Technology shifts the social context in which the learning takes place, changing either relationships between people or relationships to self

Keeping to the constructivist view of providing relevant, legitimate opportunities, Hoadley and Kilner (2005) find that "a great challenge in a learning community is to situate knowledge among people who are not physically co-located" (p. 34). The reality of business operations and models of work effort finds individual contributors looking to distant pools of resources to provide insight, ideas, and solution to the issues and problems confronting operational progress. This physical extension of resources indicates the need to expand the COP concept to a digitally enhanced form called Virtual Communities of Practice (vCOP). These vCOPs use ICT to lessen the effects of distributed business operations. Recent research by Allen, et al (2005) provides that "virtual communities of practice provide for the people-transmitted knowledge management because they provide a forum where members can transfer knowledge from person to person as they converse with one another" suggests these workgroups somehow find the means to exchange and provide solutions to operational needs regardless of location. The challenge to the HRD practitioner then becomes the need to formalize this learning activity so the outcomes are aligned with business process expectations.

With distant workgroups exchanging in vCOPs, the combined knowledge created and shared dynamically takes on new a form often referred to as "distributed cognition". Hoadley and Kilner's (2005) research indicates that distribute cognition presents another duality challenge for the HRD practitioner based in socio-technical systems theory:

> Briefly, the core challenge is that design decisions in a distributed cognitive system have to respect not only individual psychological constraints and realities, but also systemic realities. Designers are challenged to comprehend and make simplifying assumptions about such a complex system. (p. 35)

HRD practitioners must be ready to deal with the people aspects and implications – learning, motivation, group dynamics, and other human science concerns, and the technological aspects and implications – connections, bandwidth, accessibility, in order to provide an environment where legitimate exchange can be developed and sustained.

As these vCOPs form and start to produce systemic knowledge, the focus of the group changes slightly towards actual productive work will start to solve the actual real-time problems and issues of the organization. Although this may seem like a slight and insignificant discrimination between the two characteristics, the HRD practitioner must be building activities that first engage the workgroup to start to think together, then create activity that fosters the workgroup to be able to work together collaboratively solving issues and operational problems.

Kilpo, Laine, and Markkulas's (2006) research into situating real world process simulation using ICT-enabled activities provides further HRD practitioner guidance on connecting and converting individual contributor's tacit knowledge to explicit group knowledge through a designed "spiral of learning". This process simulation situates both working together

and working on a value added business outcome into a developmental opportunity that leads to both individual contributor satisfaction as well as organizational capability building.

In summary, this extensive literature review provides HRD practitioners engaged in workforce development opportunities, aspects of foundational organizational learning theories and provides success scaffolding of scientific merit. Personal mastery of both the social (people) and technical (tool) work systems is key to these HRD initiatives as the interaction between people, process and technology create dynamics of response, change and normative regeneration. As the science of learning and the science of groups working with tools interact in organizational renewal, individual HRD change agent qualities are requirements for those driving and proactively adding value to the organization. As agents for the organization, continual personal development into a viable practitioner requires core skills of both strategic and tactical caliber in meeting the human challenges of HRD.

In this ever-changing world, one constant is the progressive churn of learning technologies providing individual contributors with progressive leverage in their internal quest for social satisfaction. These technologies assist in the individual contributors drive to gain knowledge and skills as they seek their place in the social-work opportunity. The required ICT tools of global business requirements lessen the both physical and learning distances and enable individual, workgroup, and organizational progress through applied quality HRD actions.

Chapter III: Methodology

The data collected for this research focuses on the specific HRD support cell HRb identified in Table 2. The data collection method originally was designed as a situated organization development activity spanning a two-month period. This organization development opportunity was designed to provide contextual support and legitimate periphery of participation to individual participants while increasing organizational learning. During organizational negotiation to apply the method described below in the Initial Data Collection Methodology section, operational pressures limited a fully situated application. Unable to secure the required organization application, the data collection method was modified and initiated with organizational support as a baseline to gauge survey participants insight to the present organizational operational status regarding process maturity. The following describes both the initial (design) data collection methodology and the actual (realized) data collection methodology. Both warrant discussion as part of the overall research learning and discovery process.

Initial Data Collection Methodology

Initial (design) data collection methodology was developed and referred to as the Situated Data Collection (SdC) process. The SdC process was designed to situate learners in an organization development activity in order to add process development context to the learners and add HRD value to the operational organization. The SdC process was designed to engage survey participants in a series of six facilitated exchange sessions detailed in Appendix A through F. Each of the six events were designed to have a predetermined sequence of human resource development activities with the general strategies of (a) creating individual awareness,

(b) fostering teamwork that generally builds towards a viable community of practice, and (c) collecting the action data required to move the workgroup through the sequence of collective growth.

Subject Selection and Description

The business unit selected under of this study is a training and development function of a multi-national enterprise. Thirteen individual contributors were selected to participate in this capability building development opportunity. These thirteen individuals were formally considered as contributors operating within the HR*b* set of Table 2. Specifically these thirteen are LMS Administrators and function at one of three capability levels based on (a) their experience over time of working with the LMS and (b) the outcomes of their functional performance within the scope of this business unit. Without a formalized performance analysis complete, a capability matrix (task list) was used to select these LMS Administrators for this compelling opportunity to fulfill process-centric organization development activities. Refer to Table 10 for the listing of the current administration levels associated with this functional HRD competence.

Table 10

LMS Administrator Levels

Title	Competence Level Description
Learning Center Administrator	Entry
Training Coordinator	Practical
LMS System Administrator	Organizational

Instrumentation

The data collection points for this research come from Ray and Ramano's Intellectual Bandwidth (2005) model and directly provide data application as action research applied in the progressive of moving the collective capability of the workgroup. In the truest application of organization development, this series of events has organizational merit within the current functionality of this business unit under consideration.

The four quantitative action research data collection points list in Table 11. Data collection point (DCPM1) focused on bringing the larger conceptual end point (outcomes) to this research process. DCPM1 set the individual contributor's expectation of strategic workgroup process mastery. DCPM2 was designed to situate a series of cognitive propositions dealing with opportunities to explore Gilbert's first (data) requirements. DCPM3 was designed to situate a series of cognitive propositions dealing with workgroups interacting and extending their individual knowledge, insights, and performance capabilities into a high performance human system. DCPM4 was designed to close the process learning journey with process related metrics and outcome expectations initialized in the process awareness scaffolding set up with DCPM1.

Table 11.

Data Collection Points

			DCPM*x*	**Appendix**
1	General Process Maturity Item	Quantitative	DCPM1	G
2	Data Process Maturity Items	Quantitative	DCPM2	I
3	Collaboration Process Maturity Items	Quantitative	DCPM3	K
4	Process Maturity Items	Quantitative	DCPM4	M

Twenty-three of the 26 questions that make up the four quantitative data points (DCPM1-4) were designed to using a Lichert-type scale of 1 (Completely Disagree) to 5 (Completely Agree). This was designed to provide the Performance Analysis statistics of mean and standard deviation analysis. The remaining three question response options were designed as either supply-type or simple yes/no type to determine majority-based analysis.

Four 2 x 2 matrix comparing the research objectives to the data collection point questions was completed to quantify the survey instrument scope. These matrixes display in Appendix H for DCPM1, Appendix L for DCPM2, Appendix O for DCPM3, and Appendix Q for DCPM4. From these four matrixes, a summative analysis, shown in Table 12 was created detailing the percentage of question-to-research objective coverage.

Table 12

Research Objectives-to-Survey Instrument Summative Analysis

Research Objective	Number of Questions	Percent of Coverage
Define the horizontal impact of process lag.	30	81.08%
Determine adjacent HRD processes for specific vertical organizational hierarchies.	11	29.73%
Determine Process Handoffs mechanisms.	21	56.76%
Evaluate key Project Management methods across time and distance.	30	81.08%
Evaluate Process Structures and Work-break down Structures.	17	45.95%
Assess evolving HRD Support Staff Roles, Responsibilities, and Expectations.	28	75.68%
Define key integration processes for Learning Technologies.	14	37.84%
Develop HRD Process awareness.	35	94.59%
Gauge the impact of both downstream and upstream process characteristics.	25	67.57%
Define HRD Process Feedback mechanisms.	25	67.57%
Measure critical perspectives within the HRD support function.	33	89.19%
Define diffusion of innovation bottlenecks.	24	64.86%

In order to engage the thirteen HR*b* individual contributors in the SdC, a series of six scheduled events was designed to present the opportunities to engage the four action research DCPM*X* instruments. Refer to Appendix A through G. These six events were designed to combine training and organization development principles into a distributed learning opportunity for the 13 individual contributors of the HR*b* concern. The activities with in each of the six events were designed to provide for the opportunities to engage socially, discover new information, exchange for meaning, and realize the implications of action research. Refer to Table 13 for the structure of the six events that were designed for action research data collection method.

Table 13

Situated Data Collection (SdC) Event Stage Descriptions

Stage	Purpose
Publish	Social exchange
Present	Information of value, dialog for meaning
Solve	Collaborate as a team
Assign	Engage for future group event interaction
Data	Collect action research

Data Collection Timeline

Planning on a six-week event cycle, Table 14 contains the strategy process with the SdC data outcome expectations. In order for these data points to maximize benefits/add value in this situated development opportunity, the previous event data stage was designed to be part of the

subsequent next event. This research was designed to provide research survey participants engaged in the learning process with action research-based scaffolding from which they could use to build towards the project outcomes.

Table 14

SdC Data Collection Timeline

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6
Invitation	Event 1	Event 2	Event 3	Event 4	Event 5	Event 6
Data Outcome	Data Outcome	Data Outcome	Data Outcome	Data Outcome	No Data Outcome	Data Outcome
Collect DCP1	Present DCP1	Present DCP2	Present DCP3	Present DCP4		Present Impact Map & Task List
	Collect DCP2	Collect DCPM5q	Collect DCP4	Present DCPM5q		
		Collect DCP3				
Analyze DCP1	Analyze DCP2	Analyze DCP3	Analyze DCP4			
		Analyze DCP5q	Analyze DCP5q			

Data Collection Procedures

In order to engage the thirteen HR*b* individual contributors within a sound, meaningful and value added learning opportunity the SdC was designed to be administered using the survey protocol detailed in Table 15 through the ICT-based mechanics of a Learning Management System.

Table 15

SdC Event Stage Descriptions

Stage	Purpose
Prepare	Coordinate communication and engage survey incumbents
Collect	Release survey and monitor completion
Data Analysis	Handle data, perform statistical calculations, and analyze results
Publish	Research document and graphics layout

Actual (realized) data collection methodology

Due to limited organization factors that included business unit leader support, departmental project overlap, survey incumbent availability, and research deadlines, the SdC was not authorized. Strategic Global business unit operational requirements and human resource availability limited the SdC application. Actual (realized) data collection methodology was developed and referred to as the as the Baseline Data Collection (BdC) process. The BdC method borrowed verbatim the data survey instrument questions of the SdC.

In order to engage the 13 HR*b* individual contributors within a scientifically sound survey, the BdC was administered using the survey protocol detailed in Table 15. Application of the BdC data collection was designed using the SdC instrument sans the situated organization development activities designed and described in Table 14.

Three automated electronic communication events (Refer to Appendix P) were delivered without any need for survey purpose clarification or survey support mechanics. After the survey

completion deadline, the LMS Data Administrator performed the data extraction (unique identifiers were suppressed) and created a master data file. A copy of this master data file was created and the descriptive statistics analysis was performed without any major data handling errors.

Data Analysis

The twenty-three Likert-type questions were evaluated using descriptive statistics (Mean, Median, Mode, and Standard Deviation) using the decision table shown in Table 16.

Table 16

Decision Table

Mean	**SD**	**Rating**	**Decision**
3.5 – 5.00	< 1.0	High	Agreement
3.5 – 5.00	> 1.0	High	Question
1.0 – 3.49	>< 1.1	Low	Disagreement

The three remaining questions were analyzed using typical percentages and proportions. All data points and individual questions have an analysis form specifying the analysis requirements and are shown in an individual dedicated appendix. Table 17 provides a cross-reference lookup for these four Data Collection points.

Table 17

Data Collection Point to Appendix Analysis Form Cross Reference

Data Point	Analysis	Appendix
1	General Process Maturity Items	H
2	Data Process Maturity Items	J
3	Collaboration Process Maturity Items	L
4	Process Maturity Items	N

Limitations

Limitations of this research includes a limited sample size that affects the precision of the survey results, sample population knowledge and skill bias, and compression of the research time line.

This research was designed to employ cluster (natural grouping) sampling selection criteria. The actual number of LMS administrator trained in this multinational company business unit in the last years is 30. The survey participants of 13 identified were selected based on their functional support of HRD applications using the entire LMS and ICT toolset. The sample size represents 43% (13 of 30) of the actual trained HRD support population. If this research were designed to account for confidence levels and degrees of freedom used in advanced statistic calculations, there would be a greater need to insure sampling size meets the precision requirements of t-type ($n<30$) statistics. Because of the non-critical nature (human subject impact) of this research application, the survey sample size does not meet precision requirements.

The sample population was selected because of their personal mastery of the LMS and ICT tools. A capability matrix of task mastery that was not developed by this survey samplewas used historically to track the LMS administrator's functional operational expertise in providing HRD support using the LMS and other ICT toolset. From the 30 LMS administrators trained over the last three years, the 13 selected as BdC survey participants had the strongest knowledge and functional skill-set per the historical capability matrix. While being the most capable at using the LMS and ICT tools, this survey sample does not contain the entirety of HRD support population insight that could be realized by a more inclusive survey participant selection method.

The need to complete this research in a practical timeframe limited this research to just the un-situated BdC. Negotiations to obtain the application space and secure the human subjects over the designed organizational development timeline became increasingly less likely as the dynamic window of practical opportunity and the pull of research deadlines interacted in a doom loop of uncontrollable resource limitations. This timeline limitation prevented the designed research outcomes (Impact Map and Task List) from being secured from the virtual community of practice.

Chapter IV: Results and Discussion

Introduction

Data from the BdC survey presents in this summary in two distinct sections. The first data summary presentation area includes the general/operational survey results that include general data handling process statistics, respondent response rates, and a review of the respondent by location and business unit affiliation. The second data presentation area focuses on the specific results and analysis presented through the specific performance analysis metrics detailed in the Decision Guideline Table (Refer to Table 15).

General Results

Eleven of the 13 survey incumbents (84.6 percent) responded to the 26 question BdC survey items within the defined 10-day survey window. Due to the global (geographic) and operational (business unit coverage) nature of this Survey, demographic analysis of the respondents warrants detailed examination. Actual respondents (11) list at the top and non-respondent (2) list at the bottom of Table 18. Nine (81.8%) of the respondents have residence in North America and two (18.1%) are from South America. The two non-respondents (15.3%), listed at the last two entries in Table 17 reside in the British Commonwealth countries of Canada and Australia.

Table 18

Survey Respondent by Location and Business Unit Affiliation

	Location	Business Unit Affiliation
1	Milwaukee	Learning Services
2	Milwaukee	Learning Services
3	Milwaukee	Learning Services
4	Milwaukee	Leadership Development
5	Brazil	Leadership Development
6	Chile	Technical Services
7	Southwest United States	Administration
8	Nevada	Technical Services
9	Central United States	Technical Services
10	Northern United States	Technical Services
11	Global	Leadership Development
12	Australia	Administrative
13	Canada	Administrative

Specific Results

This baseline survey was administered to gauge the process maturity of the global vCOP (HRD support sample) using Data, Collaboration, and Process Maturity questions as a measure of HRD support services effectiveness. Table 19 through Table 25 summarizes each of the survey segments in relation to the performance standards detailed in Table 15.

DCPM1Results

The first survey segment measures the General (overall) Process Maturity in a single Likert-type question with the results presented in Table 19.

Table 19

Decision Table for General Process Maturity Items (DCPMI)

	Mean	**SD**	**Rating**	**Decision**
Question 1	3.5454	0.8201	High	Agreement

Response analysis of this single question indicates a high rating and decision consensus based on the mean value above 3.5 and a standard deviation below 1.0 (refer to Table 15). The 3.5454 mean value combined with the standard deviation of 0.8201 indicates this virtual community of practice (survey respondents) is in agreement that the group functions at an operational maturity level between the Defined (response level 3) and the Managed (response level 4) Process Maturity Level. The results indicate that this virtual community has moved from defining and documenting their processes to collecting metrics to understand how well they follow their documented processes.

DCPM2 Results

The second survey segment measures Data Process Maturity via eight Likert-type questions (refer to Table 20) and a single yes/no question (refer to Table 21).

Table 20

Decision Table for Data Process Maturity Items (DCPM2)

	Mean	SD	Rating	Decision
Question 1	3.9090	1.1361	High	Question
Question 2	3.7272	1.2720	High	Question
Question 3	3.5454	1.1281	High	Question
Question 4	4.3636	0.6741	High	Agreement
Question 5	3.4545	1.1281	Low	Disagreement
Question 6	3.1818	1.2504	Low	Disagreement
Question 8	3.3333	2.08166	Low	Disagreement

The responses listed in Table 20 are the measurement of the vCOP member's awareness of their Data Process Maturity level. Response analysis of Question 1 indicates a high rating and a decision that must be questioned (addressed by the group) on the mean value above 3.5 and a standard deviation above 1.0. The 3.9090 mean value combined with the standard deviation value of 1.1361 indicates this vCOP (survey respondents) are questioning the use of data collected being pertinent, applicable, and adding value to the operation of the HRD community of practice. Response analysis of Question 2 indicates a high rating and a decision that must be questioned (addressed by the group) based on the mean value above 3.5 and a standard deviation above 1.0 (refer to Table 15). The 3.7272 mean value combined with the standard deviation value of 1.2720 indicates that this vCOP (survey respondents) is questioning whether the data collected is converted in to meaningful information.

Response analysis of Question 3 indicates a high rating and a decision that must be questioned (addressed by the group) based on the mean value above 3.5 and a standard deviation above 1.0 (refer to Table 15). The 3.5454 mean value combined with the standard deviation value of 1.1281 indicates that this vCOP (survey respondents) is questioning whether the information is being used being applied in a systematic predictive manner (feedback) for the improvement of the group's collective operations.

Response analysis of Question 4 indicates a high rating and decision consensus based on the mean value above 3.5 and a standard deviation below 1.0 (refer to Table 15). The 4.3636 mean value combined with the standard deviation value of 0.6741 indicates this vCOP (survey respondents) is in agreement that decision makers associated with this vCOP use some kind of data analysis or decision support systems to help them make HRD support operation decisions.

Response analysis of Question 5 indicates a low rating with a disagreement decision that should be immediately addressed by the group based (refer to Table 15) on the mean value below 3.5 and a standard deviation above 1.0. The 3.4545 mean value combined with the standard deviation value of 1.1281 indicates that this vCOP (survey respondents) should schedule and hold information exchange seminars that would provide the means to distribute wisdom to those vCOP members looking to improve their knowledge and skill.

Response analysis of Question 6 indicates a low rating and a disagreement decision that must be questioned (addressed by the group) based on the mean value above 3.5 and a standard deviation above 1.0 (refer to Table 15). The 3.1818 mean value combined with the standard deviation value of 1.2504 indicates this vCOP (survey respondents) suggests that a concerted documentation effort needs to take place during vCOP interactions to document the experience-generated wisdom, stemming the current knowledge loss.

Response analysis of Question 7, the single yes/no response option in DCPM2, indicates that 82% of the respondents acknowledge the presence and use of a central knowledge repository. While a majority response acknowledges the central problem/solution repository, room for improvement is suggested by the results of the non-respondents. Refer to Table 21 for the data representation of the survey response.

Table 21

Results for Question 7 of the Data Process Maturity Items (DCPM2)

Option	**Results**
Yes	9
No	2

Response analysis of Question 8 indicates a low rating with a disagreement decision that should be immediately addressed by the group based on the mean value below 3.5 and a standard deviation above 1.0 (refer to Table 15). The 3.3333 mean value combined with the standard deviation value of 2.08166 indicates there is a systemic lack of awareness of the central repository. Further analysis suggests those whom have awareness of the repository do not seek the repository as their first choice for solutions.

DCPM3 Results

The third survey segment measures Collaboration Process Maturity via eight Likert-type questions and a single supply-type (fill-in) question. Refer to Table 22 for the Likert-type results obtained from the survey respondents.

Table 22

Decision Table for Collaboration Maturity Items (DCPM3)

	Mean	Standard Deviation	Rating	Decision
Question 1	4.4545	0.5222	High	Agreement
Question 3	4.4545	0.5222	High	Agreement
Question 4	2.9090	1.3751	Low	Disagreement
Question 5	3.8181	1.1677	High	Question
Question 6	4.3636	0.5045	High	Agreement
Question 7	3.8181	0.9816	High	Agreement
Question 8	3.0000	1.0000	Low	Disagreement
Question 9	3.5454	1.1281	Low	Question

Response analysis of Question 1 indicates a high rating and decision consensus based on the mean value above 3.5 and a standard deviation below 1.0 (refer to Table 15). The 4.4545 mean value combined with the standard deviation value of 0.5222 indicates the respondents agree that most work done in the vCOP involves group work and suggests this workgroup has awareness of the complexity of their HRD work outcomes.

Response analysis of Question 2, a supply-type type question, identifies that survey respondents classify 68% of their work as requiring participation as part of a team.

Response analysis of Question 3 indicates a high rating and decision consensus based on the mean value above 3.5 and a standard deviation below 1.0 (refer to Table 15). The 4.4545 mean value combined with the standard deviation value of 0.5222 indicates there is a high degree of communication among the members of the vCOP as they provide solution support to the larger organization HRD requirements.

Response analysis of Question 4 indicates a low rating with a disagreement decision that should be immediately addressed by the group based on the mean value below 3.5 and a standard deviation above 1.0 (refer to Table 15). The 2.9090 mean value combined with the standard deviation value of 1.3751 indicates the vCOP the members work together collaboratively throughout the length of the project while sharing pertinent HRD support information. While the mean and standard deviation is indicating disagreement, the data indicates this vCOP actively engage with each other along the project timeline.

Response analysis of Question 5 indicates a low rating and a decision that must be questioned (addressed by the group) based on the mean value above 3.5 and a standard deviation above 1.0 (refer to Table 15). The 3.8181 mean value combined with the standard deviation value of 1.1677 indicates this vCOP (survey respondents) suggests there are standalone tasks that can be done by individuals without other vCOP member's involvement.

Response analysis of Question 6 indicates a high rating and decision consensus based on the mean value above 3.5 and a standard deviation below 1.0 (refer to Table 15). The 4.3636 mean value combined with the standard deviation value of 0.5045 indicates agreement on the

need that some tasks to be completed by other vCOP members prior to working on their part of the project. This suggests that formalized process step handoff mechanisms are in place.

Response analysis of Question 7 indicates a high rating and decision consensus based on the mean value above 3.5 and a standard deviation below 1.0 (refer to Table 15). The 3.8181 mean value combined with the standard deviation value of 0.9816 indicates vCOP members are aware of their personal requirements to complete their project task before other vCOP members can complete their assigned tasks.

Response analysis of Question 8 indicates a low rating with a disagreement decision that should be immediately addressed by the group based on the mean value below 3.5 and a standard deviation at, or above 1.0 (refer to Table 15). The 3.0000 mean value combined with the standard deviation value of 1 indicates that there is a freedom to work on project tasks without the other workgroup members collaborating suggesting these vCOP member understand there is a high level of autonomous task completion present.

Response analysis of Question 9 indicates a low rating and a decision that must be questioned (addressed by the group) based on the mean value above 3.5 and a standard deviation above 1.0 (refer to Table 15). The 3.5454 mean value combined with the standard deviation value of 1.1281 indicates that this vCOP (survey respondents) suggests there should be a further analysis to determine possible task efficiencies that will delineate/clarify vCOP member's responsibilities.

DCPM4 Results

The fourth survey segment measures Overall Process Maturity through seven Likert-type questions detailed in Table 23 and a single yes/no question detailed in Table 24.

Table 23

Decision Table for Overall Process Maturity Items (DCPM4)

	Mean	**Standard Deviation**	**Rate**	**Decision**
Question 1	4.1818	0.8738	High	Agreement
Question 2	3.6363	1.1200	Low	Disagreement
Question 3	3.3636	1.2060	High	Disagreement
Question 4	3.5454	1.2135	High	Question
Question 6	3.0000	1.4142	Low	Disagreement
Question 7	3.8333	1.3291	High	Question
Question 8	3.8333	1.1690	High	Question

Response analysis of Question 1 indicates a high rating and decision consensus based on the mean value above 3.5 and a standard deviation below 1.0 (refer to Table 15). The high 4.1818 mean value combined with the standard deviation value of 0.8738 indicates that the associated vCOP members agree they understand task completion ownership.

Response analysis of Question 2 indicates a high rating and a decision that must be questioned (addressed by the group) based on the mean value above 3.5 and a standard deviation above 1.0 (refer to Table 15). The 3.6363 mean value combined with the standard deviation value of 1.1200 indicates that this vCOP (survey respondents) suggests there is not a fixed way

of doing most of the associated HRD support tasks. Exploration of these task variations in best practices meetings would increase process improvement awareness and distribute effective process throughout the global HRD support network.

Response analysis of Question 3 indicates a low rating with a disagreement decision that should be immediately addressed by the group based on the mean value below 3.5 and a standard deviation above 1.0 (refer to Table 15). The 3.3636 mean value combined with the standard deviation value of 1.2060 indicates this vCOP group should attend to continuous improvement task-step analysis.

Response analysis of Question 4 indicates a high rating and a decision that must be questioned (addressed by the group) based on the mean value above 3.5 and a standard deviation above 1.0 (refer to Table 15). The 3.5454 mean value combined with the standard deviation value of 1.2135 indicates that this vCOP (survey respondents) suggests that some of the workgroup are following the documented way of doing the job and that others are not following documented way of doing the job.

Response analysis of the yes/no Question 5 (refer to Table 24) indicates 36% of respondents indicate there is an official document that outlines how a particular task should be done as measured. This suggests that survey respondents indicate the need for publishing and maintaining a task library on the associated HRD support skills.

Table 24

Results for Question 5 of the Overall Process Maturity Items (DCPM4)

Option	Results
Yes	4
No	7

Response analysis of Question 6 indicates a low rating with a disagreement decision that should be immediately addressed by the group based on the mean value below 3.5 and a standard deviation above 1.0 (refer to Table 15). The low 3.0000 mean value combined with the standard deviation value of 1.4142 indicates there is a lack of systems analysis to see how well people follow the official document for doing their HRD support work.

Response analysis of Question 7 indicates a high rating and a decision that must be questioned (addressed by the group) based on the mean value above 3.5 and a standard deviation above 1.0 (refer to Table 15). The 3.8333 mean value combined with the standard deviation value of 1.3291 indicates that this vCOP (survey respondents) suggests the need to develop viable process support mechanisms (training, best practice meetings, task support software, etc) to assist this HRD support group in finding process problems and improving the documented process.

Response analysis of Question 8 indicates a high rating and a decision that must be questioned (addressed by the group) based on the mean value above 3.5 and a standard deviation above 1.0 (refer to Table 15). The 3.8333 mean value combined with the standard deviation value of 1.1690 indicates the need to improve the monitoring of task completion using approved

documentation. The data suggests this will lead to improved (more effective) processes within the HRD support community.

A summative compilation of the total Likert-type response-to-decision category results displays in Table 25.

Table 25

Total Likert-type Question Response Distribution

Category	**Amount**	**Percentage**
Agreement	6	26.08%
Question	8	34.78%
Disagreement	8	34.78%

Analysis of this the overall response distribution (Agreement, Question, and Disagreement), shown in Table 25, indicates that 16 of the 23 (69.56%) Likert-type questions are either at Question or in Disagreement performance levels as measured by the by the vCOP members indicating a lack (high majority) of Overall Process Maturity.

Chapter V: Summary, Conclusions and Recommendations

Summary

Global business operations, based on stateside manufacturing and distant sales and service operations, present a wide range of operational support pressures on both the regionally based individual contributors - those performing the local work, and the centrally located core human resource development function - those that provide developmental support to the individual contributors.

Restated Purpose of the Study

The goal of this research provides a HRD operations framework called the Impact Map for all company based human resource development operations involved in a specific program called the Skills Management System (SMS) Pilot. The purpose of this research was to measure in detail of the unknown organizational performance process details required for sustainable HRD through action research techniques.

Data Collection Summary

Data for the BdC survey was collected without major incident or operational error based on the following narrative. The data collection was formally initiated by the released of the survey via the LMS. The communication plan was started and prompted survey participants to access the survey. Their progress was monitored over the 10-day window via a built in LMS gap function that programmatically evaluated completion status and delivered automated reminders to non-complete survey participants. Eleven of the 13 participants responded within the 10 day survey window. Processing the collected data began by saving and copying the raw data file. Unique identifiers were removed and a data clean up and initial analysis was performed on the backup copy. The initial data analysis was completed to determine demographic and percentage

of completion statistics. A further detailed data analysis was completed to determine the performance analysis requirements of mean and standard deviation. A backup file of the processed, post-analyzed data was created and stored on the same media as the raw data file. From this analyzed data, the information required in Chapter IV was developed.

Conclusions

This research set up to measure thirteen objectives in a situated organizational development activity. Eleven of the 13 original objectives listed in Chapter I do not have research-based results (answers) to discuss as a result of this specific research. These non-measured list immediately below.

1. Define the horizontal impact of process lag.
2. Determine adjacent HRD processes for specific vertical organizational hierarchies.
3. Determine Process Handoffs mechanisms.
4. Evaluate key Project Management methods across time and distance.
5. Evaluate Process Structures and Work breakdown Structures.
6. Assess evolving HRD Support Staff Roles, Responsibilities, and Expectations.
7. Define key integration processes for Learning Technologies.
8. Gauge the impact of both downstream and upstream process characteristics.
9. Develop the capacity of the individual contributor assigned to the HRD function to add Value-Added efficiencies.
10. Measure critical perspectives within the HRD support function.
11. Define diffusion of innovation bottlenecks.

Two of the 13 original objectives listed in Chapter I do have measurable results to discuss and list immediately below.

1. Develop HRD Process awareness

2. Define HRD Process Feedback mechanisms

Developing HRD process awareness objective was realized in this research through the un-situated application and measurement of the 26-question process maturity survey. Survey respondents indicate this vCOP work process maturity is at a mean of 3.5454 and SD of 0.8201, approximately midpoint between the Defined and Managed levels of process maturity.

Defining HRD Process Feedback mechanisms objective was realized in this research through the un-situated application and measurement of the 26-question process maturity survey. Survey respondents having participated and engaged with the survey have been presented with the cognitive anchors survey questions, provided their input, and

Assessment of the deliverable outcomes identified in this research should begin at assessing the two initial outcomes of this methodology: (a) a Task List and (b) an Impact (process) Map. Organizational readiness, resource availability, and a shift in the Skills Management System Business Unit owner limited these two outcomes from being complete in this BdC version of the suggested SdC methodology. Without obtaining the organizational development opportunity required to apply the initial situated data collection (SdC) resulted in a "flat" data collection (BdC) un-situated in the dynamic context of progressive organizational learning. From a delivery perspective of the two action research outcomes (Impact Map and Task Analysis) this research method closes without a favorable ending.

Recommendations

1. The BdC survey tool provides solid performance metrics for building mature processes. The operational metrics found in the survey questions should be used as further measurement and process feedback tools in continuous improvement of HRD support services.

2. Further investigate opportunities in which to use the full (situated) ScD method. This will provide an application activity to measure the full list of objectives and develop an organization development via action research.

3. Attention to advanced inferential statistics like variance, confidence levels, and correlations in the survey design phase would provide improved insight and value to the resulting data of the survey regardless of SdC or BdC application.

4. HRD practitioners should engage Business Unit Leaders regularly in purposeful dialog on timeline and human resources constraints in order to expose strategic shifts in organizational development priorities.

5. A follow on dialog with the vCOP under examination in this specific application of the BdC should occur to bring survey closure and provide an opportunity for the HRD practitioner to receive continuous improvement feedback.

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Appendix A: Data Development Stage

Task - Step	Activity
Stage 1 - Publish	
Activity 1 – Social	Organizational Story – Registrar / Institute
Activity 2 – Roundup/Debrief	Learning Awareness
Activity 3 – Event Overview	Event Activity Overview
Stage 2 - Present	
Activity 1 - Data	Present General Process Maturity Items (DCPM1) data
Activity 2 - Material	Present Goal Scope Plan Tools Timeline Boundary Documents
Activity 3 - Challenge	Task List and Impact Map
Stage 3 - Solve	
Activity 1 – Short Term	Percentage Calculation
Activity 2 – Medium Term	Multi-group - Multiple Calculation
Activity 3 – Roundup/Debrief	Learning Awareness
Stage 4 - Assign	
Activity 1 - Small	Group Portfolio
Activity 2 - Medium	Multiple Perspectives Exercise
Stage 5 – Data	
Activity 1 - Collect	Data Process Maturity Item (DCPM2)
Activity 2 - Manipulate	Post Data Maturity

Appendix B: Collaboration Development Stage

Stage - Activity	Activity
Stage 1 - Publish	
Activity 1 – Social	Cultural Update – Javier
Activity 2 – Roundup/Debrief	Learning Awareness
Activity 3 – Event Overview	Event Activity Overview
Stage 2 - Present	
Activity 1 - Data	Group Portfolio
	Data Process Maturity Item (DCPM2)
Activity 2 - Material	Present Data – Qualitative vs. Quantitative Collaboration Process Data Maturity
Activity 3 - Challenge	Collect Examples of Qualitative Boundaries (DCPM5q)
Stage 3 - Solve	
Activity 1 – Short Term	Distribution Data
Activity 2 – Long Term	Multiple Perspectives Dialog
Stage 4 - Assign	
Activity 1 - Small	Types of Measurement – List of Five (5)
Activity 2 - Medium	NEED
Stage 5 – Data	
Activity 1 - Collect	Collaboration Process Maturity Items (DCPM3)
Activity 2 - Manipulate	Post

Appendix C: Process Development Stage

Stage - Activity	Activity
Stage 1 - Publish	
Activity 1 – Social	LCA Class – June 2006 - Lillie
Activity 2 – Roundup/Debrief	Learning Awareness
Activity 3 – Event Overview	Event Activity Overview
Stage 2 - Present	
Activity 1 - Data	Collaboration Process Maturity Items (DCPM3)
Activity 2 - Material	Present Process Symbols Phase/ Stage/Step/ Step Hierarchy Project Management
Activity 3 - Challenge	NEED
Stage 3 - Solve	
Activity 1 – Short Term	Phase, Stage, Task, Step - "Peel the Apple"
Activity 2 – Long Term	Webex Initiation & Teleconference Instructions
Stage 4 - Assign	
Activity 1 - Small	Attendees Choice
Activity 2 - Medium	Phase, Stage, Task, Step – 2 groups – schedule time Build Skills Phase Assessment Phase
Stage 5 – Data	
Activity 1 - Collect	Process Maturity Items (DCPM4)
Activity 2 - Manipulate	Post

Appendix D: vCOP Performance Stage 1

Stage - Activity	Activity
Stage 1 - Publish	
Activity 1 – Social	Organizational Story - TBD
Activity 2 – Roundup/Debrief	Learning Awareness
Activity 3 – Event Overview	Event Activity Overview
Stage 2 - Present	
Activity 1 - Data	Process Maturity Items (DCPM4)
Activity 2 - Material	Review of Data Collected to date: General Process Maturity Items DCPM1 Data Process Maturity Item DCPM2 Collaboration Process Maturity Items DCPM3
Activity 3 - Challenge	Distribute DCPM1, DCPM2, DCPM3, DCPM4, and DCPM5 to groups for vCOP Closeout Event preparation
Stage 3 - Solve	
Activity 1 – Short Term	May be left open in this Event -To be determined (TBD)
Activity 2 – Medium Term	TBD
Activity 3 – Roundup/Debrief	TBD
Stage 4 - Assign	
Activity 1 - Small	TBD
Activity 2 - Medium	TBD
Stage 5 – Data	
Activity 1 - Collect	TBD
Activity 2 - Manipulate	TBD

Appendix E: vCOP Performance Stage 2

Stage - Activity	**Activity**
Stage 1 - Publish	
Activity 1 – Social	Organizational Story - TBD
Activity 2 – Roundup/Debrief	Learning Awareness
Activity 3 – Event Overview	Event Activity Overview
Stage 2 - Present	
Activity 1 - Data	Present DCPM5q
Activity 2 - Material	TBD
Activity 3 - Challenge	TBD
Stage 3 - Solve	
Activity 1 – Short Term	TBD
Activity 2 – Medium Term	TBD
Activity 3 – Roundup/Debrief	TBD
Stage 4 - Assign	
Activity 1 - Small	TBD
Activity 2 - Medium	TBD
Stage 5 – Data	TBD
Activity 1 - Collect	TBD
Activity 2 - Manipulate	TBD

Appendix F: vCOP Close out

Stage - Activity	Activity
Stage 1 - Publish	
Activity 1 – Social	Organizational Story – Fast Forward
	Each vCOP contributor details
Activity 2 – Roundup/Debrief	Learning Awareness
Activity 3 – Event Overview	Event Activity Overview
Stage 2 - Present	
Activity 1 - Data	TBD
Activity 2 - Material	Display DCPM1, DCPM2, DCPM3, DCPM4, and DCPM5 Task Analysis (Task Step Breakdown) Impact Map
Activity 3 - Challenge	TBD
Stage 3 - Solve	
Activity 1 – Short Term	TBD
Activity 2 – Medium Term	TBD
Activity 3 – Roundup/Debrief	TBD
Stage 4 - Assign	
Activity 1 - Small	TBD
Activity 2 - Medium	TBD
Stage 5 – Data	
Activity 1 - Collect	None
Activity 2 - Manipulate	TBD

Appendix G: Data Point 1 – (DCPM1) General Process Maturity Items

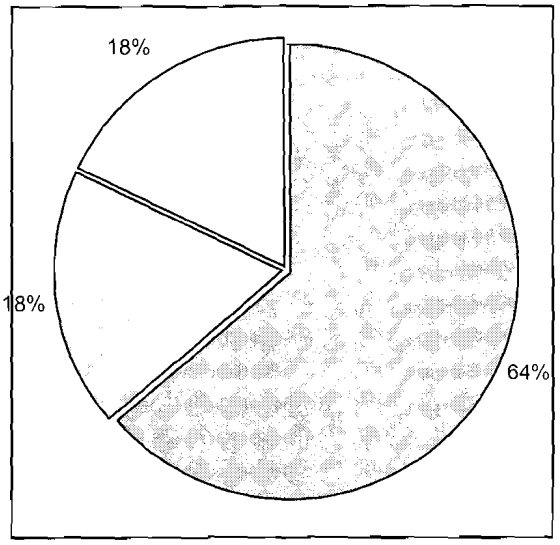
1. Initial: Processes that are ad-hoc in nature characterize this stage. There is no well-defined structure and success of the process depends on individual efforts that are often heroic in scope.
2. Repeatable: At this level, some processes in the company are repeated mainly due to the fact that success has been found by using the process effectively on previous occasions.
3. Defined: Here, an effort is made to define and document the process, such that a standard can be applied and used by all units in the organization.
4. Managed: At this level, metrics are collected to understand how well the documented process is being followed.
5. Optimized: At this level, the organization is mature enough to understand that processes need to be continuously enhanced to optimize them for company use. Innovation and feedback from the processes are used to help optimize different processes

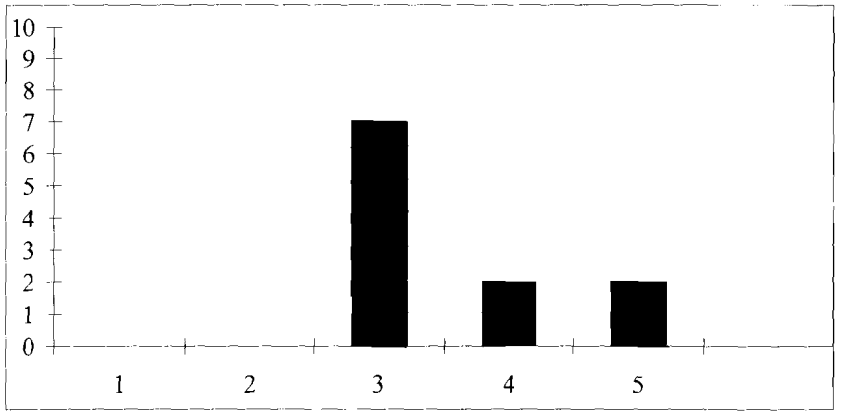
Appendix H - Research Questions to Data Collection Point 1 (DCPM1)
Confirmation Matrix 1

	Question 1	Question 2	Question 3	Question 4	Question 5
	Initial: Processes that are ad-hoc in nature characterize this stage.	Repeatable: At this level, some processes in the company are repeated mainly due to the fact that success has been found by using the process effectively on previous occasions	Defined: Here, an effort is made to define and document the process, such that a standard can be applied and used by all units in the organization.	Managed: At this level, metrics are collected to understand how well the documented process is being followed	Optimized: At this level, the organization is mature enough to understand that processes need to be continuously enhanced to optimize them for company use.
Define the horizontal impact of process lag.			X	X	X
Determine adjacent HRD processes for specific vertical organizational hierarchies.			X	X	X
Determine Process Handoffs mechanisms.			X	X	X
Evaluate key Project Management methods across time and distance.	X	X	X	X	X
Evaluate Process Structures and Work-break down Structures.				X	X
Assess evolving HRD Support Staff Roles, Responsibilities, and Expectations.	X	X	X	X	X

Define key integration processes for Learning Technologies.		X	X	X	X
Develop HRD Process awareness.	X	X	X	X	X
Gauge the impact of both downstream and upstream process characteristics.				X	X
Define HRD Process Feedback mechanisms.		X	X	X	X
Measure critical perspectives within the HRD support function.					X
Define diffusion of innovation bottlenecks.					X

Appendix I: Analysis of Data Point 1 - General Process Maturity (DCPM1) Items

Evaluate Numeric		Graph
Percentage	Sixty three percent (63.3%) of the respondents identified the level of overall Process Maturity as Defined.	

Evaluate Descriptive Statistics		Graph
Mean	3.5454	
Median	3	
Mode	3	
S.D.	0.8201	

Appendix J: Data Point 2 – (DCPM2) Data Process Maturity Items

1: Data related to the company's day-to-day activities (for example about customer, sales, manufacturing, defects etc) are collected.

5	4	3	2	1
Completely Agree	Somewhat Agree	Neither Agree or Disagree	Somewhat Disagree	Completely Disagree

2: Data collected is analyzed to generate information (like average sales for a branch, product with highest sales, most spending customer etc).

5	4	3	2	1
Completely Agree	Somewhat Agree	Neither Agree or Disagree	Somewhat Disagree	Completely Disagree

3: Information from data analysis is used to predict important information for the company. (For example sales for next month)

5	4	3	2	1
Completely Agree	Somewhat Agree	Neither Agree or Disagree	Somewhat Disagree	Completely Disagree

4: Decision makers in the company use some kind of data analysis or decision support systems to help them make decisions.

5	4	3	2	1
Completely Agree	Somewhat Agree	Neither Agree or Disagree	Somewhat Disagree	Completely Disagree

5: Wisdom gained due to experience of working in the same field is shared by organizing information exchange seminars.

5	4	3	2	1
Completely Agree	Somewhat Agree	Neither Agree or Disagree	Somewhat Disagree	Completely Disagree

6: Wisdom gained due to experience is put into written form to capture knowledge of experienced employees.

5	4	3	2	1
Completely Agree	Somewhat Agree	Neither Agree or Disagree	Somewhat Disagree	Completely Disagree

7: All work units in the company use a central repository to store information regarding the problems they faced and the solutions they found and used.				
Yes			No	
Answer Only if Question 7 is Yes 8: This central repository is common knowledge and used by most people as the first alternative to find a solution when faced with a problem.				
5	4	3	2	1
Completely Agree	Somewhat Agree	Neither Agree or Disagree	Somewhat Disagree	Completely Disagree

Appendix K1 - Research Questions – to – Data Collection Point 2
Confirmation Matrix 2

	Question 1	Question 2	Question 3	Question 4
	Data related to the company's day-to-day activities (for example about customer, sales, manufacturing, defects etc) are collected.	Data collected is analyzed to generate information (like average sales for a branch, product with highest sales, most spending customer etc).	Information from data analysis is used to predict important information for the company. (For example sales for next month)	Decision makers in the company use some kind of data analysis or decision support systems to help them make decisions.
Define the horizontal impact of process lag.	X	X	X	
Determine adjacent HRD processes for specific vertical organizational hierarchies.				
Determine Process Handoffs mechanisms.				
Evaluate key Project Management methods across time and distance.	X	X	X	X
Evaluate Process Structures and Work-break down Structures.			X	
Assess evolving HRD Support Staff Roles, Responsibilities, and Expectations.	X	X	X	X

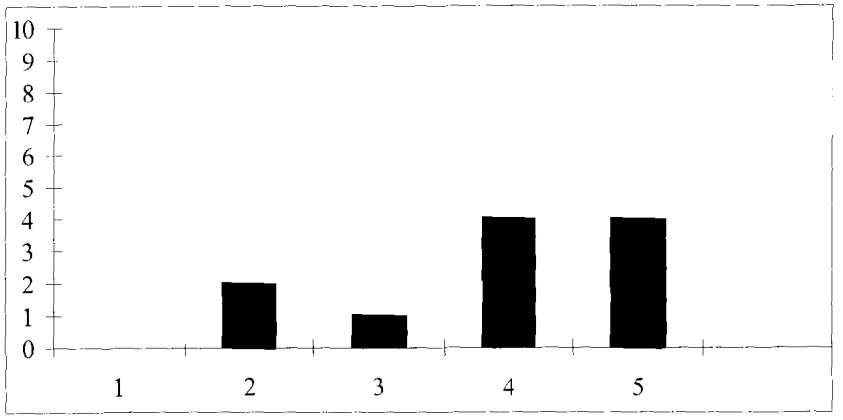
Define key integration processes for Learning Technologies.				
Develop HRD Process awareness.	X	X	X	X
Gauge the impact of both downstream and upstream process characteristics.	X	X	X	X
Define HRD Process Feedback mechanisms.				X
Measure critical perspectives within the HRD support function.	X	X	X	X
Define diffusion of innovation bottlenecks.				X

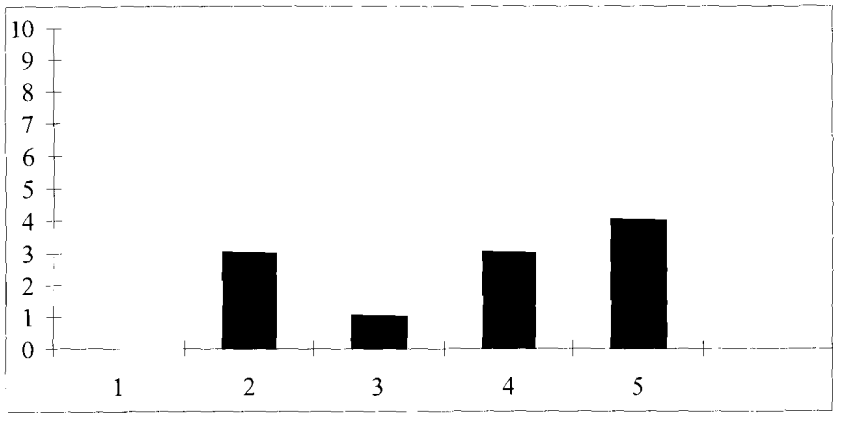
Appendix K2 - Research Questions – to – Data Collection Point 2
Confirmation Matrix 2

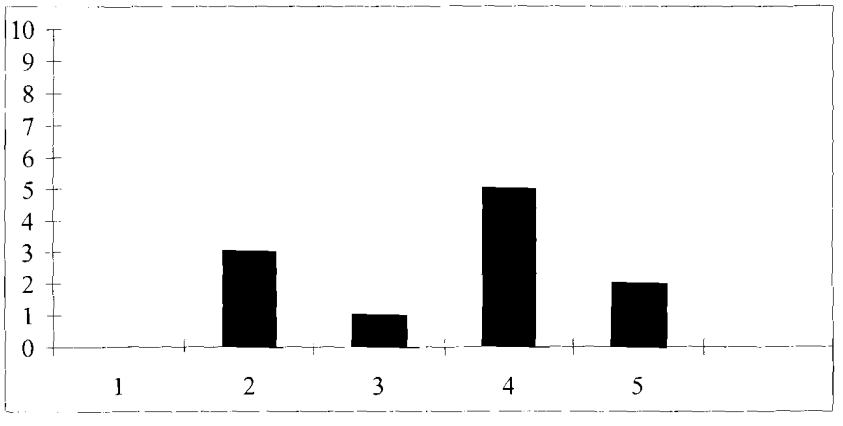
	Question 5	Question 6	Question 7	Question 8
	Wisdom gained due to experience of working in the same field is shared by organizing information exchange seminars.	Wisdom gained due to experience is put into written form to capture knowledge of experienced employees.	All work units in the company use a central repository to store information regarding the problems they faced and the solutions they found and used.	This central repository is common knowledge and used by most people as the first alternative to find a solution when faced with a problem.
Define the horizontal impact of process lag.				
Determine adjacent HRD processes for specific vertical organizational hierarchies.				
Determine Process Handoffs mechanisms.				
Evaluate key Project Management methods across time and distance.	X	X	X	X
Evaluate Process Structures and Work-break down Structures.				
Assess evolving HRD Support Staff Roles, Responsibilities, and Expectations.	X	X	X	X
Define key integration processes for Learning Technologies.				
Develop HRD Process awareness.	X	X	X	X
Gauge the impact of both downstream and upstream process characteristics.	X	X	X	X
Define HRD Process Feedback mechanisms.	X	X	X	X

Measure critical perspectives within the HRD support function.	X	X	X	X
Define diffusion of innovation bottlenecks.	X	X	X	X

Appendix L: Analysis of Data Point 2 - Data Process Maturity Items

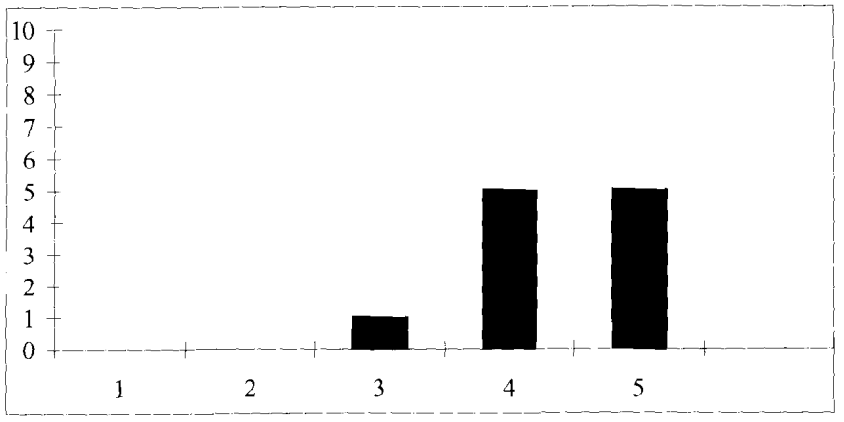
Question 1		Graph
Mean	3.9090	
Median	4	
Mode	4	
SD	1.1361	

Question 2		Graph
Mean	3.7272	
Median	4	
Mode	5	
SD	1.2720	

Question 3		Graph
Mean	3.5454	
Median	4	
Mode	4	
SD	1.1281	

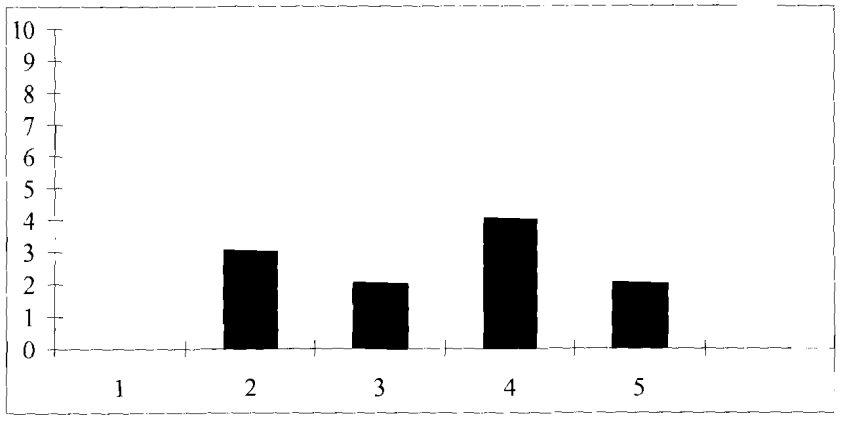
Question 4	
Mean	4.3636
Median	4
Mode	4
SD	0.6741

Graph



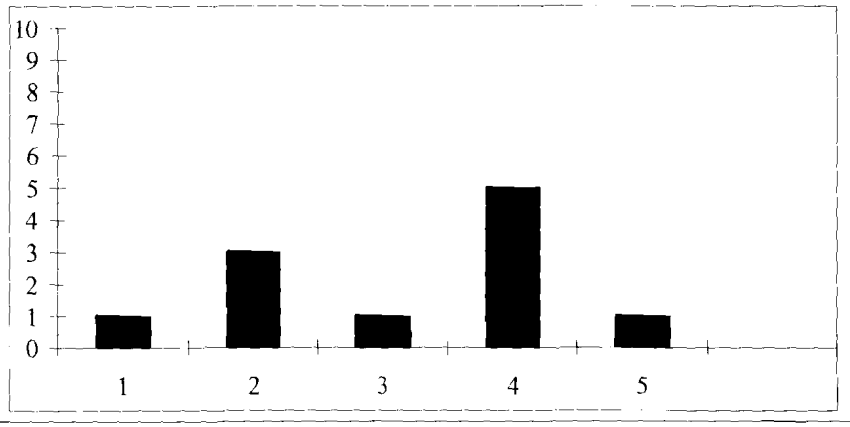
Question 5	
Mean	3.45454
Median	4
Mode	4
SD	1.1281

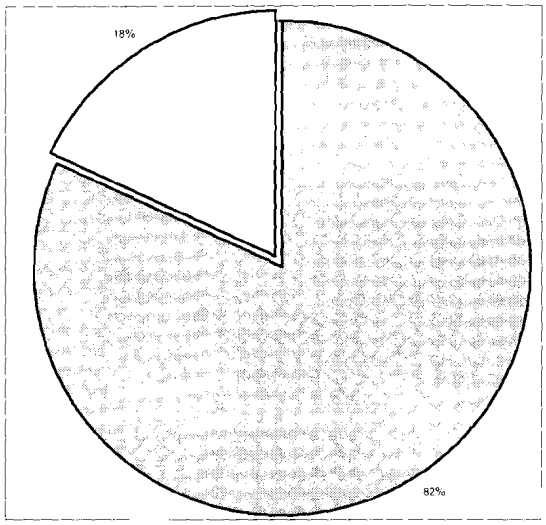
Graph

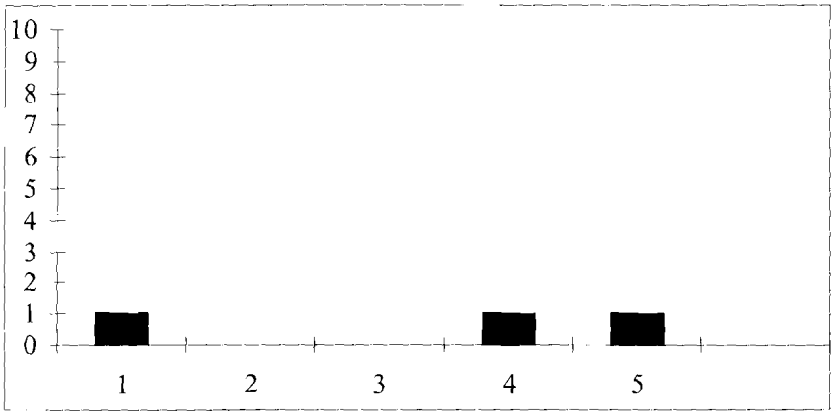


Question 6	
Mean	3.1818
Median	4
Mode	4
SD	1.2504

Graph



Question 7		Graph
Percentage	Eighty two percent (82%) of the respondents in acknowledge the presence and use of a central knowledge repository.	

Question 8		Graph
Mean	3.3333	
Median	4	
Mode	N/A	
SD	2.0816	

Appendix M: Data Point 3 – (DCPM3) Collaboration Process Maturity Items

1: Most work done in my organization involves group work

5	4	3	2	1
Completely Agree	Somewhat Agree	Neither Agree or Disagree	Somewhat Disagree	Completely Disagree

2: What percentage of the work performed in the work unit requires group participation.

_____ %

3: There is a high degree of communication among the members of my work unit.

5	4	3	2	1
Completely Agree	Somewhat Agree	Neither Agree or Disagree	Somewhat Disagree	Completely Disagree

4: Members of the work unit do their tasks independently and at the end of the project all the work done is put together as one project.

5	4	3	2	1
Completely Agree	Somewhat Agree	Neither Agree or Disagree	Somewhat Disagree	Completely Disagree

5: There is a high level of interdependency among tasks done by individual work unit members.

5	4	3	2	1
Completely Agree	Somewhat Agree	Neither Agree or Disagree	Somewhat Disagree	Completely Disagree

6: I need some tasks to be completed by my work unit members to be able to work on my part of the project.

5	4	3	2	1
Completely Agree	Somewhat Agree	Neither Agree or Disagree	Somewhat Disagree	Completely Disagree

7: Most work unit members cannot begin their tasks until some have completed their part of the project.

5	4	3	2	1
Completely Agree	Somewhat Agree	Neither Agree or Disagree	Somewhat Disagree	Completely Disagree

8: A high amount of work done by your work unit needs all members in your work unit to work at the same time and on the same task. (For example: Most work done by a decision-making committee (deciding on which equipment to buy) needs all its members to sit together and decide on what model, how many units etc.)

5	4	3	2	1
Completely Agree	Somewhat Agree	Neither Agree or Disagree	Somewhat Disagree	Completely Disagree

9: All work unit members work towards project completion simultaneously.

5	4	3	2	1
Completely Agree	Somewhat Agree	Neither Agree or Disagree	Somewhat Disagree	Completely Disagree

Appendix N1- Research Questions – to – Data Collection Point 3
Confirmation Matrix 3

	Question 1	Question 2	Question 3	Question 4
	Most work done in my organization involves group work.	What percentage of the work performed in the work unit requires group participation . %	There is a high degree of communication among the members of my work unit.	Members of the work unit do their tasks independently and at the end of the project all the work done is put together as one project.
Define the horizontal impact of process lag.	X	X	X	X
Determine adjacent HRD processes for specific vertical organizational hierarchies.	X	X	X	X
Determine Process Handoffs mechanisms.	X	X	X	X
Evaluate key Project Management methods across time and distance.				X
Evaluate Process Structures and Work-break down Structures.				X
Assess evolving HRD Support Staff Roles, Responsibilities, and Expectations.				
Define key integration processes for Learning Technologies.	X			X
Develop HRD Process awareness.	X			X
Gauge the impact of both downstream and upstream process characteristics.				X
Define HRD Process Feedback mechanisms.			X	
Measure critical perspectives within the HRD support function.	X	X	X	X

Define diffusion of innovation bottlenecks.			X	X

Appendix N2 - Research Questions – to – Data Collection Point 3
Confirmation Matrix 3

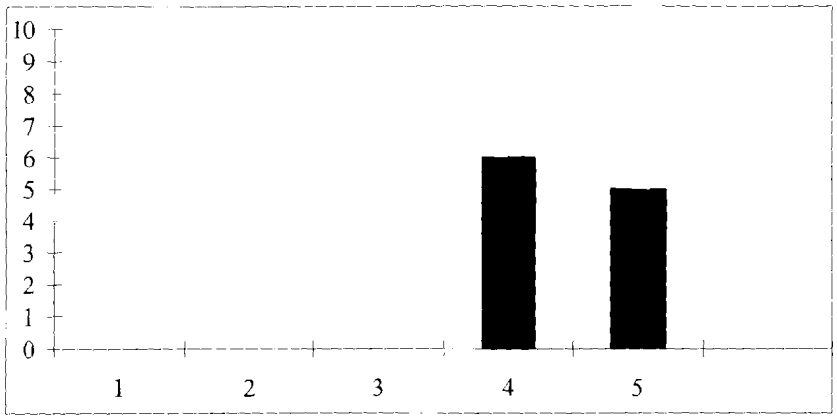
	Question 5	Question 6	Question 7	Question 8	Question 9
	There is a high level of interdependency among tasks done by individual work unit members.	I need some tasks to be completed by my work unit members to be able to work on my part of the project.	Most work unit members cannot begin their tasks until some have completed their part of the project.	A high amount of work done by your work unit needs all members in your work unit to work at the same time and on the same task.	All work unit members work towards project completion simultaneously.
Define the horizontal impact of process lag.	X	X	X	X	X
Determine adjacent HRD processes for specific vertical organizational hierarchies.	X				
Determine Process Handoffs mechanisms.	X	X	X	X	X
Evaluate key Project Management methods across time and distance.	X	X	X	X	X
Evaluate Process Structures and Work-break down Structures.	X	X	X	X	X
Assess evolving HRD Support Staff Roles, Responsibilities, and Expectations.					
Define key integration processes for Learning Technologies.	X	X	X	X	X
Develop HRD Process awareness.	X	X	X	X	X
Gauge the impact of both downstream and upstream process characteristics.	X	X	X	X	X
Define HRD Process Feedback mechanisms.					

Measure critical perspectives within the HRD support function.	X	X	X	X	X
Define diffusion of innovation bottlenecks.	X	X	X	X	X

Appendix O: Analysis of Data Point 3 – (DCPM3) Collaboration Process Maturity Items

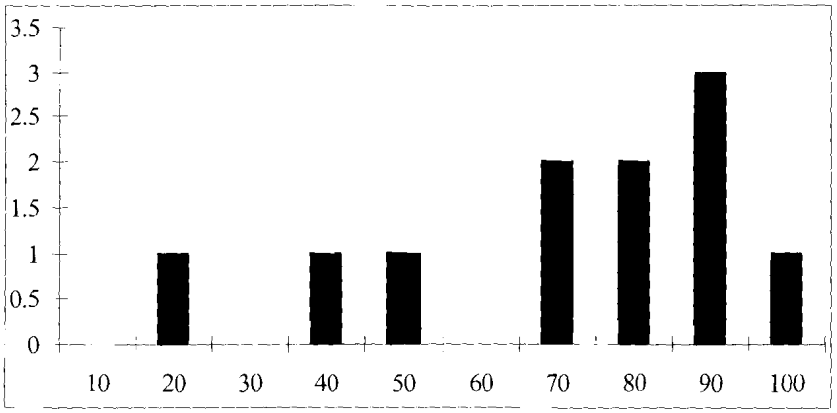
Question 1	
Mean	4.4545
Median	4
Mode	4
SD	0.5222

Graph



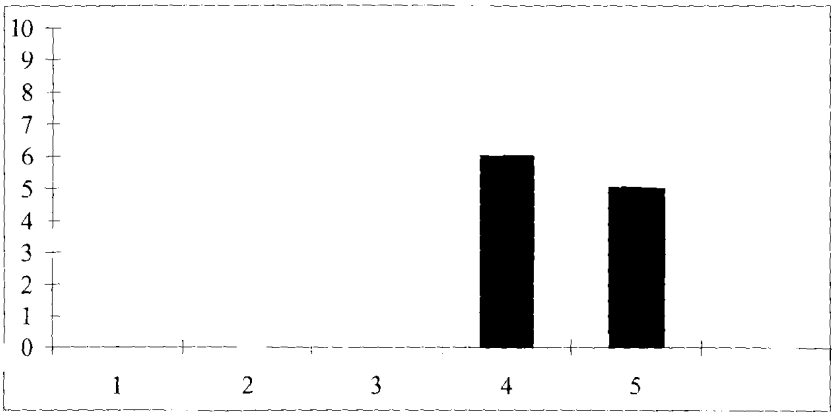
Question 2	
Mean	68.1818
Median	75
Mode	75
SD	24.1114

Graph



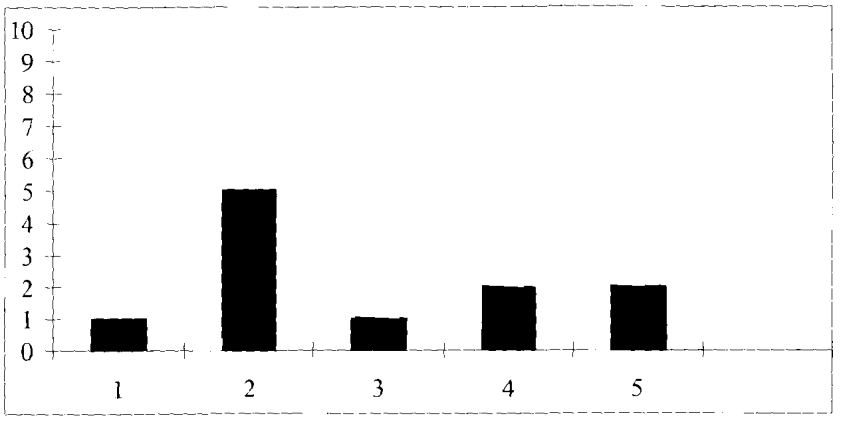
Question 3	
Mean	4.4545
Median	4
Mode	4
SD	0.5222

Graph



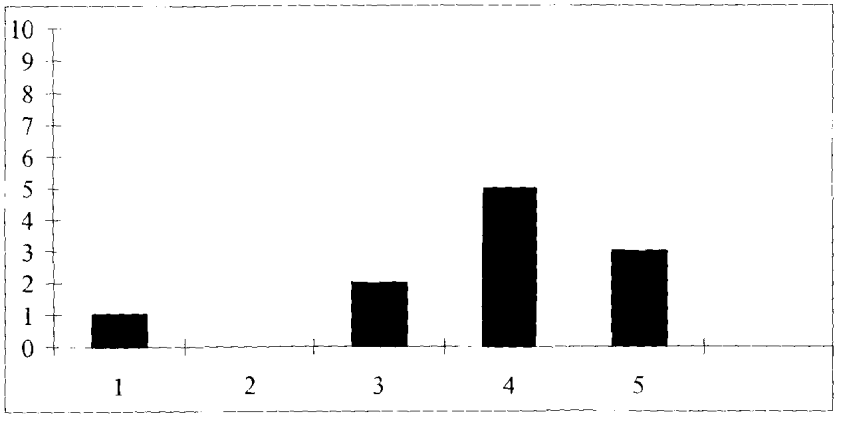
Question 4	
Mean	2.9090
Median	3
Mode	3
SD	1.3751

Graph



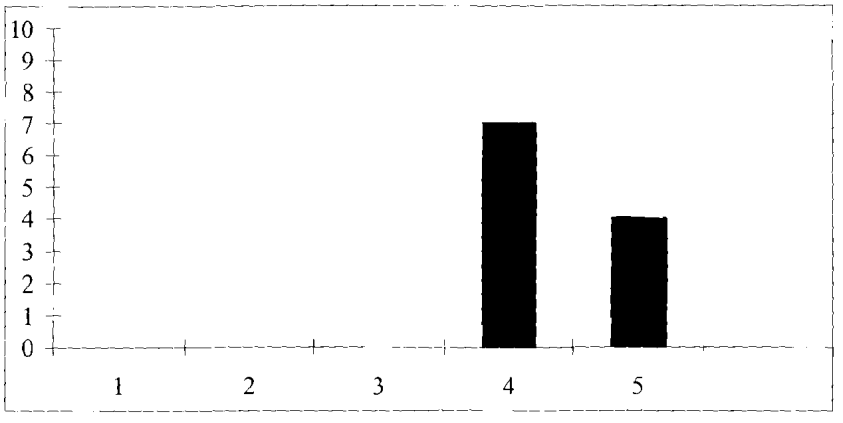
Question 5	
Mean	3.8181
Median	4
Mode	4
SD	1.1677

Graph



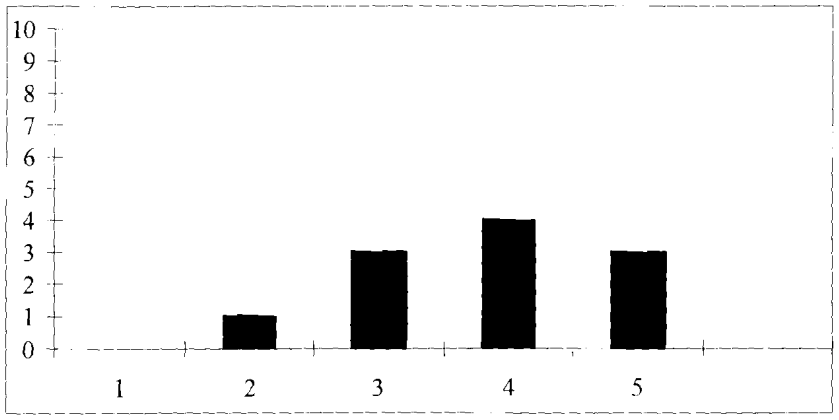
Question 6	
Mean	4.3636
Median	4
Mode	4
SD	0.5045

Graph



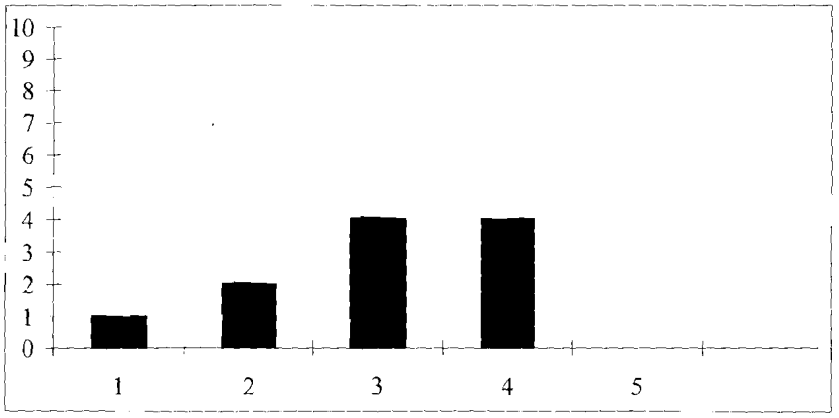
Question 7	
Mean	3.8181
Median	4
Mode	4
SD	0.9816

Graph



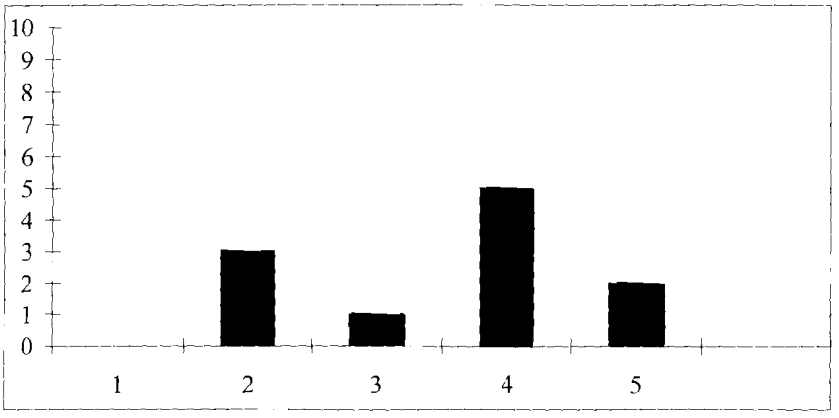
Question 8	
Mean	3
Median	3
Mode	3
SD	1

Graph



Question 9	
Mean	3.5454
Median	4
Mode	4
SD	1.1281

Graph



Appendix P: Data Point 4 – (DCPM4) Process Maturity Items

1: Everybody in the work unit has a clear idea of what jobs (tasks) are done by others in the work unit.

5	4	3	2	1
Completely Agree	Somewhat Agree	Neither Agree or Disagree	Somewhat Disagree	Completely Disagree

2: There is a fixed way of doing most of the jobs (tasks) in the work unit.

5	4	3	2	1
Completely Agree	Somewhat Agree	Neither Agree or Disagree	Somewhat Disagree	Completely Disagree

3: Most people in the work unit follow this fixed way of doing their job (or task).

5	4	3	2	1
Completely Agree	Somewhat Agree	Neither Agree or Disagree	Somewhat Disagree	Completely Disagree

4: Most people follow the documented way of doing the job (or task).

5	4	3	2	1
Completely Agree	Somewhat Agree	Neither Agree or Disagree	Somewhat Disagree	Completely Disagree

5: There is an official document that outlines how a particular task should be done.

Yes	No

Answer Only if Question 5 is Yes
6: Information is collected to find out how well people follow the official document for doing their work.

5	4	3	2	1
Completely Agree	Somewhat Agree	Neither Agree or Disagree	Somewhat Disagree	Completely Disagree

Answer Only if Question 5 is Yes
7: This information is used to find problems and improve the documented process.

5	4	3	2	1
Completely Agree	Somewhat Agree	Neither Agree or Disagree	Somewhat Disagree	Completely Disagree

Answer Only if Question 5 is Yes 8: Every process in the official document is periodically monitored to find out ways to make it more efficient.				
5	4	3	2	1
Completely Agree	Somewhat Agree	Neither Agree or Disagree	Somewhat Disagree	Completely Disagree

Appendix Q1 - Research Questions – to – Data Collection Point 4
Confirmation Matrix 4

	Question 1	Question 2	Question 3	Question 4
	Everybody in the work unit has a clear idea of what jobs (tasks) are done by others in the work unit.	There is a fixed way of doing most of the jobs (tasks) in the work unit.	Most people in the work unit follow this fixed way of doing their job (or task).	Most people follow the documented way of doing the job (or task).
Define the horizontal impact of process lag.	**X**	X	X	X
Determine adjacent HRD processes for specific vertical organizational hierarchies.	X			
Determine Process Handoffs mechanisms.	X	X	X	X
Evaluate key Project Management methods across time and distance.	X	X	X	**X**
Evaluate Process Structures and Work-break down Structures.	X	X	X	X
Assess evolving HRD Support Staff Roles, Responsibilities, and Expectations.	X	X	X	X
Define key integration processes for Learning Technologies.				
Develop HRD Process awareness.	X	X	X	X
Gauge the impact of both downstream and upstream process characteristics.	X	X	X	X
Define HRD Process Feedback mechanisms.	X	X	X	X
Measure critical perspectives within the HRD support function.	X	X	X	X

Define diffusion of innovation bottlenecks.				

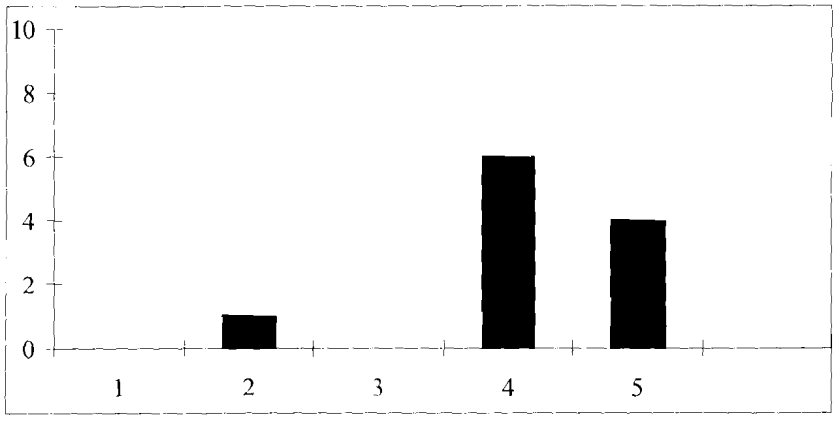
Appendix Q2 - Research Questions – to – Data Collection Point 4
Confirmation Matrix 4

	Question 5	Question 6	Question 7	Question 8
	There is an official document that outlines how a particular task should be done.	Information is collected to find out how well people follow the official document for doing their work.	This information is used to find problems and improve the documented process.	Every process in the official document is periodically monitored to find out ways to make it more efficient.
Define the horizontal impact of process lag.	X	X	X	X
Determine adjacent HRD processes for specific vertical organizational hierarchies.				
Determine Process Handoffs mechanisms.	X	X	X	X
Evaluate key Project Management methods across time and distance.	X	X	X	X
Evaluate Process Structures and Work-break down Structures.	X	X	X	X
Assess evolving HRD Support Staff Roles, Responsibilities, and Expectations.	X	X	X	X
Define key integration processes for Learning Technologies.				
Develop HRD Process awareness.	X	X	X	X
Gauge the impact of both downstream and upstream process characteristics.	X	X	X	X
Define HRD Process Feedback mechanisms.	X	X	X	X
Measure critical perspectives within the HRD support function.	X	X	X	X
Define diffusion of innovation bottlenecks.	X	X	X	X

Appendix R: Analysis of Data Point 4 - Process Maturity Items

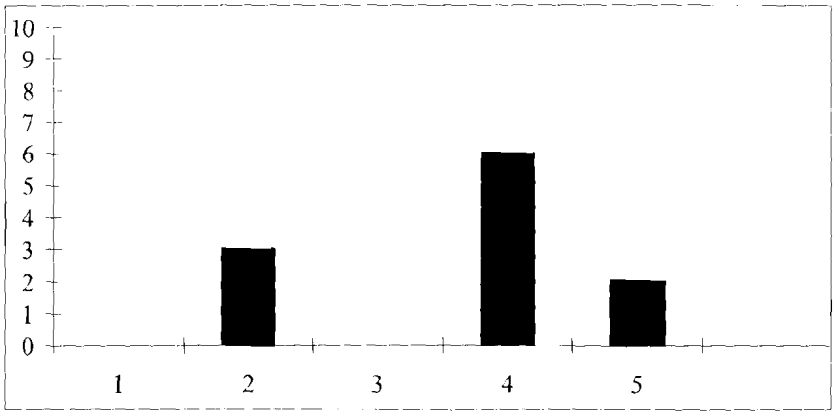
Question 1	
Mean	4.1818
Median	4
Mode	4
SD	0.8738

Graph



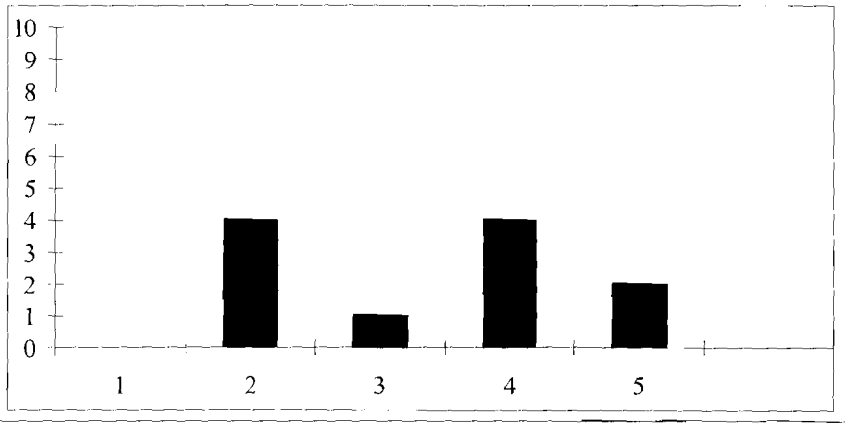
Question 2	
Mean	3.6363
Median	4
Mode	4
SD	1.1200

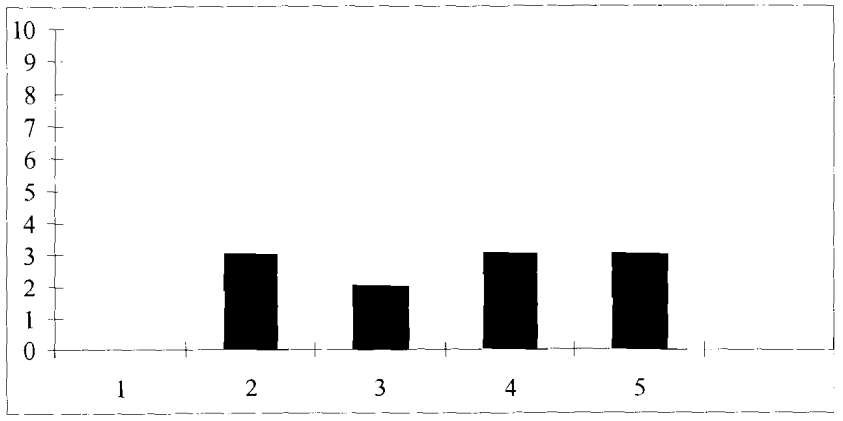
Graph

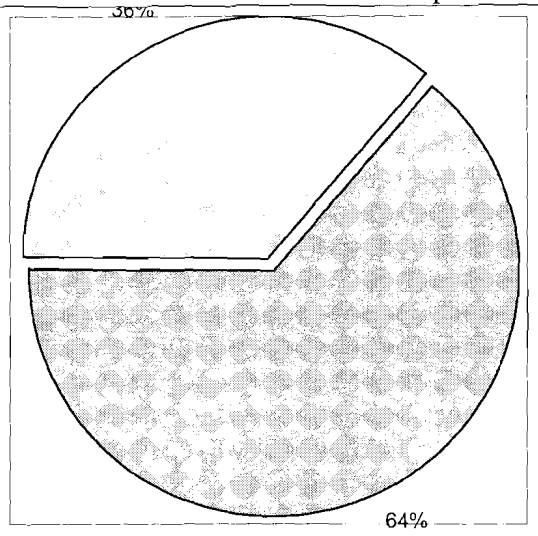


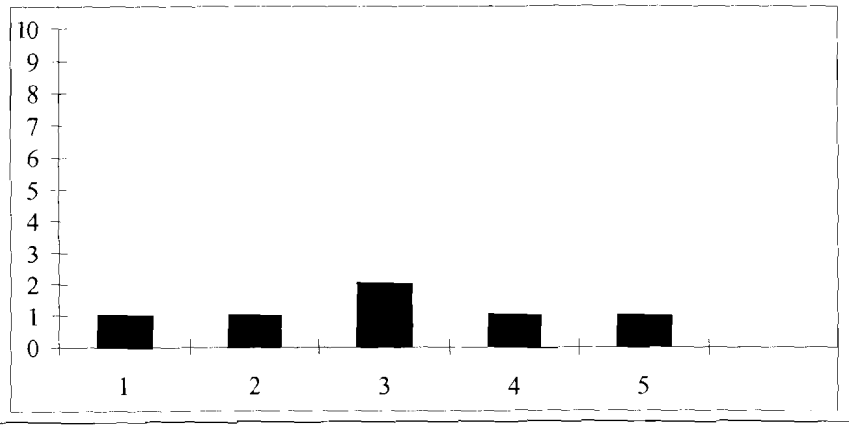
Question 3	
Mean	3.3636
Median	4
Mode	2
SD	1.2060

Graph



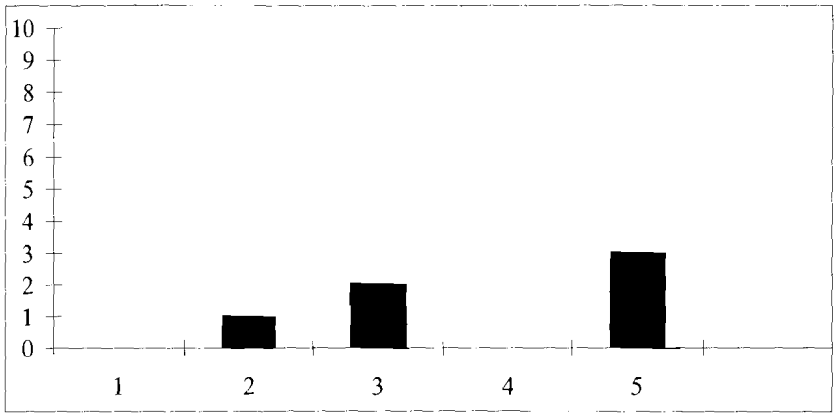
Question 4		Graph
Mean	3.5454	
Median	4	
Mode	2	
SD	1.2135	

Question 5		Graph
Percentage	Thirty percent (36%) of respondents indicate that there is an official document that outlines how a particular task should be done.	

Question 6		Graph
Mean	3	
Median	3	
Mode	3	
SD	1.4142	

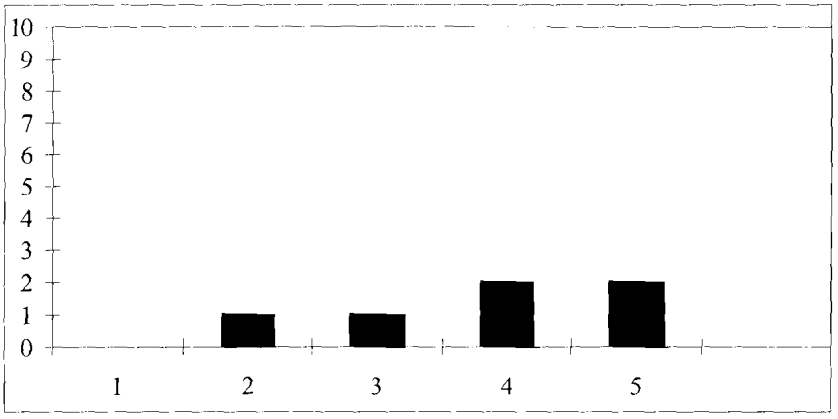
Question 7	
Mean	3.8333
Median	4
Mode	5
SD	1.3291

Graph



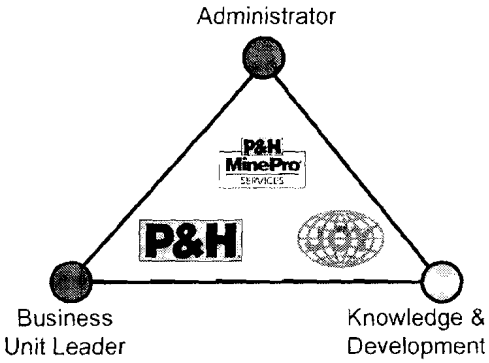
Question 8	
Mean	3.8333
Median	4
Mode	4
SD	1.1690

Graph



Appendix S: LMS Administrator Roles, Responsibility, and Expectations

LMS Administrator
Roles, Responsibilities, and Expectations



LMS Administrator

Roles	**Responsibilities**	**Expectations**
Data Coordinator	Collect and maintain training/development information	Prompt and accurate attention to detail
Registration Administrator	Register employees into classes	
	Front line Customer Service	Timely and effective follow through
	Provide LMS Support to local Human Resources/Safety, etc	
Communication Liaison	Coordinate communications relating to local and regional Training and Development classes	Advocate of the LMS Give/Receive Feedback
	Deliver updates about LC Administration Activities between the region and Knowledge and Development	Share Best Practices

Appendix T: ScD Communication Plan

BcD Communication #1 – Survey Invitation

Greetings

This is an Invitation to participate in a survey to gauge your opinion. This survey asks you to consider the overall process maturity of our training and development services. You have been identified as a survey participant because of your on going involvement in the support and delivery of training and development solutions to the various P&H business units.

This survey contains a total of 24 questions distributed in 4 separate survey segments. The survey should take about a half hour of your time. Please plan in advance so that you will have enough time to complete each of the four survey segments.

In order to assure confidentiality, your responses will remain anonymous. After all participants of the surveys are complete, the collective results of the survey will be shared with you.

In order to direct you to the survey, the Learning Management System (LMS) will be used. You can expect two notifications from the LMS. The first notification you will receive on October 23, 2007 is a curriculum notification titled "Learning Services Survey". After you receive this first notification, you may sign onto the Learning Center and proceed to the assessments. This assessment will be made available through a course identified as **Learning Services Survey**. This course contains the four (4) assessments (content objects). A second notification will only be sent if you do not complete of the surveys question by October 31, 2007.

Please complete the survey by October 31, 2007. After this date the survey will not be available.

Thank you in advance for completing this survey!
If you have any question about this survey please contact

Dave Draper at 414-671-7814
ddraper@phmining.com

BcD Communication #2 – Survey Notification

FOR A RESPONSE TO YOUR QUESTIONS REGARDING THE CURRICULUM LISTED BELOW, PLEASE CONTACT DAVE DRAPER AT ddraper@phmining.com OR 414-671-7814.

Greetings David,

A new curriculum has been added to your Learning Plan. The details are the following:

The details are the following:

Curriculum Name: Learning Services Survey

Courses Included in Curriculum:

Sequence	Course Code	Course Name
1	A4AE700A	**Learning Services Survey**

Due Date: Friday, October 31, 2007

Please click on the following link to access the Learning Center.

https://phpeakservices.pathlore.net/stc/pnhm/

Sign on to the Learning Center, view your Assigned Curriculums, and complete each course in the Product Support Applications curriculum.

Again, if you have questions regarding this email, please contact Rosie Lentz. If you need ID and Password assistance you may contact your local Learning Center Administrator, Training Coordinator, or one of the contacts listed below.

Thank you.

ScD Communication #3 – Survey Reminder

FOR A RESPONSE TO YOUR QUESTIONS REGARDING THE CURRICULUM LISTED BELOW, PLEASE CONTACT DAVE DRAPER AT ddraper@phmining.com OR 414-671-7814.

Greetings [First Name],

This is a reminder to complete a curriculum that was added to your Learning Plan. Please complete this training by Friday, October 26, 2007.

The details are the following:

Curriculum Name: Learning Services Survey

Courses Included in Curriculum:

Sequence	Course Code	Course Name
1	A4AE700A	**Learning Services Survey**

Due Date: Friday, October 31, 2007

Please click on the following link to access the Learning Center:

https://phpeakservices.pathlore.net/stc/pnhm/

Sign on to the Learning Center, view your Assigned Curriculums, and complete each course in the Product Support Applications curriculum.

Again, if you have questions regarding this email, please contact Dave Draper. If you need ID and Password assistance you may contact your local Learning Center Administrator, Training Coordinator, or one of the contacts listed below.

Thank you.