

SSM Inspired Organizational Change in a North American University Library: Lessons Learned

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Abstract. This organizational change initiative involved nineteen project participants in guided application of Soft Systems Methodology (SSM) tools to rethink, repurpose, and retool organizational outcomes from 2003-2006. Action research results suggest the efficacy of using this approach for interactive (re)design of technology-enabled environments, systems and tools. This paper reports on learning insights which inform participants' cultivation of user-centric, inquiry based relationships with both co-workers and system users to animate and enable responsive participatory design philosophy, practices and outcomes.

Introduction

In order for college and university faculty and students to fully participate in contemporary higher education organizations, information and knowledge workers in college and university libraries must re-invent workplace processes and practices. This requires revisiting professional roles and relationships defined by industrial age models. Initiated by advancements in information technology and accentuated by changing knowledge production practices, organizational

members must 'reinvent' themselves as they move towards embracing innovative knowledge enabling opportunities.

In reconsidering workplace processes and practices, workers must revisit professional roles and relationships in the light of information technology advancements which drive new 'user experience' expectations. For example, it is now commonplace for people to produce and share their own information, rather than waiting for book or journal publishers to create and deliver the material – a concept known as peer production. Internet-based social networking sites offer another popular way to create and exchange unmediated information. These new ways to produce and consume information have also transformed individuals' encounters with and experiences of information.

In the case of the North American students who participated in this study, most have grown up with the digital technologies now widely available in the new millennium. These young people have spent their entire lives using computers, video games, digital music players, video cameras, mobile phones, email, instant messaging, and other technology tools and toys. As a result, these 'digital natives' think and act differently than the people for whom traditional academic information systems were designed (Brown & Adler 2008; Lippincott 2005; Windham 2005, 2006). As a consequence, organizational members, in this case library staff, discovered that both expectations about 'user experiences' – as well as fundamental system design assumptions – required deep (re)learning. This was successfully orchestrated through inclusive design approaches guided by SSM-inspired leadership tools.

This Soft Systems Methodology-enabled research study, conducted from 2003 to 2006 in a comprehensive university in California, USA, built upon the benefits and processes of SSM, which are well elaborated (e.g., Checkland 1981, 2000; Checkland & Holwell 1998a; Checkland & Poulter 2006; Checkland & Scholes 1990; Flood & Jackson 1991; Flood & Romm 1996; Jackson 2000, 2003). The project purpose, however, extended well beyond conventional usage of SSM for information systems design. Rather, organizational leaders aimed to embed 'systems thinking' into a strategic leadership approach for organizational change. Anticipated project outcomes, therefore, included revisiting workplace assumptions, advancing organizational learning, and enabling collaborative co-design.

The research framework acknowledged that in order to develop organizational capacity to nimbly respond to change, workers must actively discover new roles, responsibilities and relationships. As the following examples demonstrate, when heightened relationships among public sector employees are further enriched by enhanced communications 'with and for' user communities, innovative system designs can emerge within an evolving learning organization culture. This paper presents the SSM-enabled leadership model and illustrates its efficacy.

In the following, we describe process based findings on the use of Soft Systems Methodology as a tool for enabling systems (re)thinking. Such a participatory, inquiry-based appreciative approach (Checkland & Casar 1986; Vickers 1983a, 1983b) is based on robust dialogue (Banathy & Jenlick 2005) which enables participants' reconsideration of traditional boundaries and tacit assumptions. As our real world examples illustrate, such rethinking advances workplace learning and thereby improves alignment with both institutional priorities and constituencies' needs. We conclude the paper by highlighting critical dimensions of organizational transition.

Participatory Action Research

Participatory action research informs our exploration of the efficacy of systems thinking for organizational change. There are various forms of action research (Baskerville & Wood-Harper 1998; Checkland & Holwell 1998b; Dick 2004) and various definitions, of which one is Rapoport's (1970: 499): "Action research aims to contribute both to the practical concerns of people in an immediate problematic situation and to the goals of social science by joint collaboration within a mutually acceptable ethical framework". In other words, action research intends to solve a practical problem and at the same time increase scientific knowledge. The usefulness of combining systems thinking and action research has been pointed out by leading systems thinkers (e.g., Checkland 1985; Flood 1998; Midgley 2000; Wilson 2001).

Participatory action research is a form of action research that involves practitioners as both subjects and co-researchers in the systemic and cyclic process of situation diagnosis, action planning, and action taking (intervening), followed by evaluating and reflecting – i.e., learning (Susman & Evered 1978). This is in contrast to other types of applied research in which the researcher is understood to be the expert (Whyte, et al. 1991). In contrast, participatory action research aims to construct an environment where participants freely exchange information and make informed choices, thereby promoting commitment to the investigation results (Argyris & Schön 1991). Through collaboratively constructing, testing and improving theories, individuals learn about the world together (Elden & Levin 1991).

Systems thinking is also a fundamental underpinning of our organizational change approach. which encourages viewing the organization as an enterprise level organism. Methodologies enable appreciation of the interdependent relationships with customers, suppliers, and other stakeholders. Its focus on the purpose or function of the part within the whole also encourages analysis of influential internal and external environmental factors (e.g., Checkland 1981; Churchman 1971, 1984). In addition, the concept of emergent properties recognizes that holistic systems thinking must be ongoing so that workers remain

functionally aligned as effective parts of the whole. Additionally, as this approach requires renegotiation of the boundaries of influence and concern, practice also encourages reflection on organizational culture, systems, and structures.

In this case study, to encourage the university library's improved functioning as a dynamic center of instruction, exploration and learning, we introduced the participants to systems thinking tools which activated – and challenged – their prior understandings. Checkland's Soft Systems Methodology (SSM) inclusive approach proved to be highly compatible with the organizational culture. In the following section, we demonstrate how SSM Rich Pictures (Bergvall-Kåreborn & Grahn 1996; Checkland 1979; 1981; Lewis 1992) and the Processes for Organizational Meanings (POM) model (Checkland & Holwell 1993, 1998a; Rose 2002) were helpful to project participants. In addition, we explain how leaders strategically coordinated individual learning to advance organizational learning (Stacey 2003) through encouraging ongoing interactive communication (Varey 2005). Increasingly, intentional sharing of information, knowledge, skills, and abilities influenced and informed workplace decision making and action taking, fueling nimble organizational improvement amidst dynamic environmental change.

Participatory Action Research Framework: Soft Systems Methodology

Soft Systems Methodology (SSM) has been in development for over thirty years by Dr. Peter Checkland and his associates at the University of Lancaster in the United Kingdom. It is mainly used in the areas of management and information systems development. This systems thinking approach is commonly described as comprising an iterative four-stage process – finding out, modeling, comparison, and taking action. See Figure 1. Within each stage, some techniques are commonly used to support the process. For instance, Rich Pictures are often used to structure the data and impressions at the finding out stage in exploring perceptions in the 'real-world problem situation'. The main idea in Rich Picture building is to present structures and processes relevant to the situation under study and depict these, including relationships, within the 'climate' in which they exist. In modeling purposeful activity, the second stage, Checkland suggests some precise techniques – Root Definition and Activity Models – to focus and further systems thinking proficiencies. Data collection is typically inclusive, incorporating affectées, actors, decision makers, worldview, process and constraints for the real world system under study (Bergvall-Kåreborn, Mirijamdotter, Basden 2004). In a cyclical fashion, the outcome of the modeling stage is then compared against perceptions of the real-world situation to find issues and suggestions for improvements. In the comparison stage, participants

seek an accommodation of desirable and feasible changes which are then implemented, and a new cycle begins.

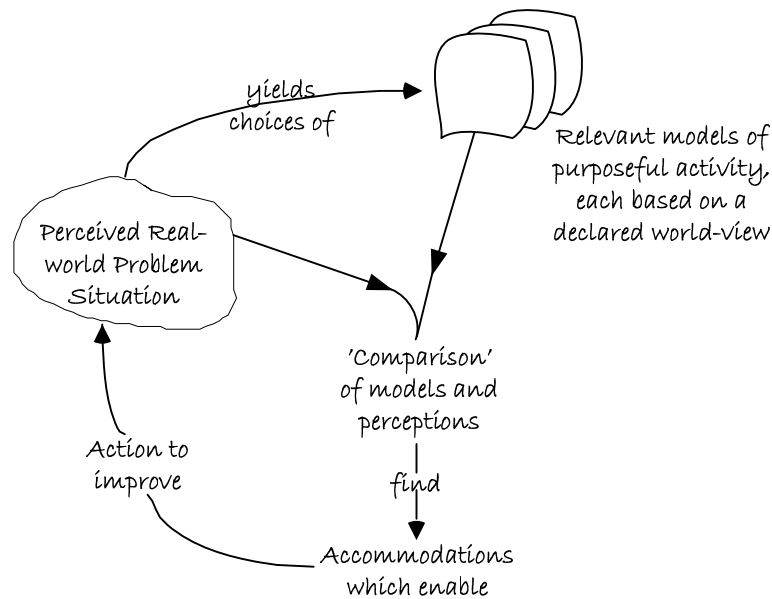


Figure 1: Soft Systems Methodology Basic Process (after Checkland 2000: S16)

In addition to the authors – who served as the group leader and the action researcher in this three year project – librarians and support staff in the case organization served as the main participants in this three year study. The participants agreed to examine underlying assumptions and beliefs that historically guided research, information, and instruction delivery decisions. They also chose to use systems thinking tools to build larger frames of reference capable of bridging boundaries within the library and across the campus. These choices affirmed that “no matter what the previous history, every system can be altered and reinvented [i.e.] if organizations are constructed, they can be reconstructed” (Norum 2001: 324p).

Inclusive Soft Systems Modeling

The initial step in this action research project aimed to prepare the librarians for working with SSM tools. For that purpose, the external SSM-conversant coach introduced rethinking elements through appreciative inquiry discussions which enabled them to (re)consider how their work purposes and professional relationships contributed to the teaching and learning mission of the University. Then project participants completed a workshop which employed the SSM Rich Picture technique as a vehicle for re-evaluating the library’s current instructional approach – face-to-face (f2f) interaction. Not only was this approach not

sustainable given diminished staffing, but also anecdotal evidence suggested that it failed to meet students' desire for 24/7 'on demand' coaching. With the intention to better understand elements of the instructional environment, including the viability of developing technology-enabled learning objects, the action researcher next introduced workshop participants to SSM methodology.

The first workshop introduced SSM philosophy and tools, including formal introduction in the Rich Picture modeling technique. Then the librarians were asked to apply the technique by depicting the 'real-world problem situation' of their personal practices of information search and retrieval. The workshop participants formed three groups and made Rich Pictures. The drawings were all quite alike and reflected the 'ideal' information literacy model adopted by North American academic librarians (ACRL 2000). In subsequent discussion, however, the librarians 'admitted' that they had not depicted what they actually did. Rather, they presented an ideal model of information search and retrieval which placed the library at the center of the process. Coaching by the consultant subsequently permitted them to see that this 'should' assumption also informed what they taught to students in formal instruction sessions. This insight served to create some 'healthy doubt' about the adequacy of the prevailing approach to information competence instruction. In addition, candid dialogue – within a 'safe' reflective environment – served to move participants from mimicking professional assumptions to sharing authentic perceptions. Building on this, the facilitator then asked participants to construct additional Rich Pictures.

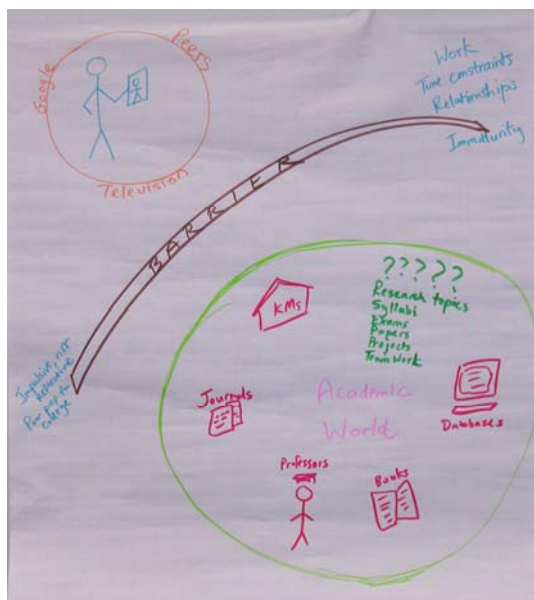


Figure2: Rich Picture of Student Processes

Figure 3: Rich Picture of Faculty Processes

The librarians were asked to draw one Rich Picture of faculty members' information search and retrieval processes and a second one of students'

processes. The results are illustrated in Figure 2 and Figure 3. Figure 2 acknowledges the considerable information fluency that freshmen possess when they enter college. The main information sources were categorized as Google, Peers, and Television. Upon entry to the university, however, students must acquire an expanded set of capabilities – including conversance with peer reviewed scholarship. In the weeks that followed creation of these Rich Pictures, information specialists, as librarians had begun to (re)consider themselves, discussed how best to transition students from ‘where they were’ to ‘where they needed to be’ upon graduation. In the light of students’ proficiencies, as represented in Figure 2, they realized that students would benefit from information literacy instruction that initially builds on students’ strengths. They also realized that instruction should be ‘scaffolded’ – building in complexity from freshmen to senior years of study – and that, given students’ internet orientation, web based instruction should be added to their instructional portfolios.

Figure 3 recognizes the diversity among faculty members’ curriculum development approaches – ranging from “couch potatoes” who build their courses from information “within easy reach” of the couch – to instructors strongly committed to identification and integration of authoritative information resources which advance students’ disciplinary competence and, concurrently, their information literacy. This concept is known as ‘relational information literacy’, whereby domain knowledge advances concurrently with information fluency (Bruce 1997).



Figure 4: Rich Picture of Information Specialist Contributions

Facilitated comparison of Figures 2 and 3 yielded the content of Figure 4, which suggests new approaches for information specialists who aim to develop improved working relationships with academic faculty. The left column in Figure 4 lists keywords that illustrate faculty members' situation (from the perspective of the librarians) – e.g., limited time amidst information overload. The right column lists commonly used information sources, at least by those who wish to advance students' relational information literacy – e.g., professional network supplemented by disciplinary journals. The figure also acknowledges that the knowledge explosion, exacerbated by heavy teaching loads, produces faculty stress.

Therefore, as illustrated at the bottom of Figure 4, the librarians identified some 'value added' approaches for alleviating faculty problems. These library outreach efforts were directed at faculty interested in resolving students' 'information source gaps'. In turn, librarians recognized the need to improve information resources to ensure easy integration of these materials into curriculum. And, in the spirit of embedded librarianship (Dewey 2004), librarians conceptualized the library's physical and digital resources as 'learning collections' which they would promote through one-on-one consultation in faculty offices, an outreach effort known as 'house calls' (Davis & Somerville 2006).

This research cycle ended by using Rich Pictures as comparison devices rather than, as recommended in the SSM Process, a preliminary step before modeling Root Definitions and Activity Models. This SSM-enabled discovery process encouraged librarians to move beyond the constraints imposed by years (in some cases, more than three decades) of "sitting at the reference desk" and pointing at bibliographic finding tools – but not entering substantively into the teaching and learning processes (Somerville & Schader 2005). In sharp contrast, following these SSM interventions, sustained dialogue with faculty subsequently produced information rich critical thinking assignments with explicit and measurable learning outcomes (e.g., Elrod & Somerville 2007) which accelerated creative inquiry among both faculty and students (Gillette & Somerville 2006). In addition, co-design processes were developed for constructing disciplinary research portals in collaboration with faculty (Somerville & Vuotto 2005) and students (Rogers, Somerville & Randles 2005). Throughout, co-discovery meaningfully advanced students' competence as information consumers and knowledge creators.

Process of Organizational Meaning Making for Workplace Development

In a concurrent Soft Systems Methodology (SSM) implementation, the external coach worked with library support staff. They too used the notion of Rich Picture – without using the technical term – to better appreciate their future workplace responsibilities within the context of the university's mission. In addition, they used the Processes for Organizational Meanings (POM) tool to design their decision support system. This rich data representation approach, fortified by SSM's inherent discourse and negotiation requirements, encouraged animated sharing of staff viewpoints. In so doing, it furthered participants' appreciation of differing viewpoints and forged common frames of reference.

The Processes for Organizational Meanings (POM) model developed by Checkland and Holwell (1998a) builds upon organizational theories for information systems (Checkland 1994a, 1994b). It relies on the dialogue and interaction embedded in Soft Systems Methodology, as furthered by Vickers' concept of the appreciative system (Checkland 1994b; Checkland & Casar 1986; Vickers 1983a, 1983b). The POM-model addresses the relationship-maintaining aspects of organizations and also visualizes them (in seven elements) as ongoing processes of creating meaning through organizational discourse. See Figure 5.

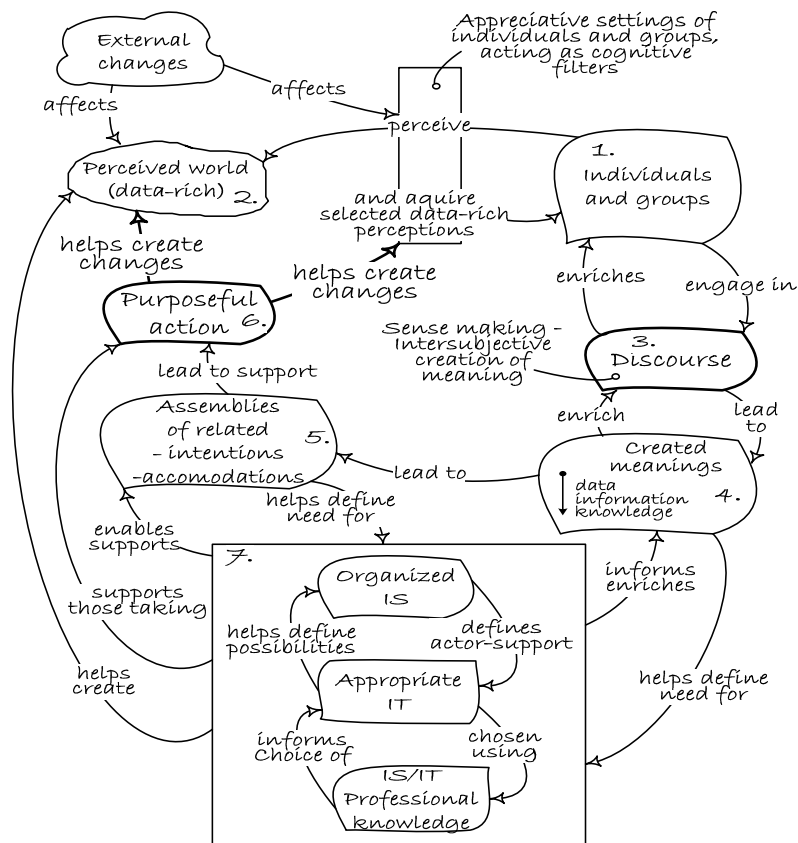


Figure 5: Processes for Organizational Meanings (POM) Model (after Checkland and Holwell 1998a: 106)

Elements 1-2 represent identification of relevant environmental elements, an exercise that both depends upon and extends workers' data collection and analysis expertise. The notion that workplace information exchanges drive ongoing processes of creating meaning through organizational discourse is expressed in elements 3-4-5. The intention is to affect co-workers' appreciative settings. Then it follows that dialogue and negotiation processes inform purposeful actions (element 6) based on accommodated views. Shared understanding in turn informs the formally organized information systems (element 7), by means of which informational support may be provided – whether 'low tech' such as telephones and hand written notes, or 'high tech' such as computers and Internet2.

As is characteristic in systems thinking, the seven elements are seen as interacting – i.e., element 7 informs and enriches element 4, and it enables and supports element 5 even as it helps to create the perceived world (element 2). In explicating this visual representation of the processes underlying creation of 'organizational meaning', participants gained heightened appreciation for both past accomplishments and challenges ahead. Additionally, this approach required renegotiation of the boundaries of influence and concern. It thereby made tacit

assumptions, values, and priorities explicit. This encouraged participants' reflection on the elements of the organizational culture, systems, and structures which define workplace purposes and outcomes, roles and responsibilities, collegiality and collaboration, and communication and information exchange. The resulting higher-level workplace dialogue cultivated a more reflective organizational culture.

Inspired by the outcomes achieved through implementation of the POM modeling process, the group leader and the action researcher next coached staff members on the participatory design of a decision support system which would support their success at a public information desk formerly staffed only by librarians. This staffing change originated from evidence derived in a study of reference desk transactions. Results revealed that most queries were directional, technical, or informational – related to course assignments. This meant that “first contact” transactions could be handled by library support staff – if they were prepared to do so – which would free the librarians to assume higher level duties. Therefore, more robust vertical and horizontal communication systems were required.

At this point in their rethinking process, the support staff understood the value of sharing information and using systems thinking to analyze and synthesize it. So they began appreciative conversations to explore their strengths and contributions in support of this new work assignment. They learned to appreciate their first hand knowledge and that of others. They also identified what else they needed to know and, additionally, who could provide this information. Subsequently, they extended their traditional boundaries to conduct conversations with university students, who further clarified information needs and service priorities. They also initiated dialogue with the librarians who were forging new academic partnerships with teaching faculty. Eventually, these relationships led to a modeling activity which served to clarify functional systems requirements – to capture data, information, and knowledge for formal representation in a computer-based information system. As depicted in Figure 6 below, this exercise anchored common understandings and forged interactive relationships.

This figure illustrates the interaction between library support staff, termed information and instructional service support staff by this time, and university librarians, here termed information specialists, in a proposed Research and Information Service and Education (RISE) system. The change in terminology is significant – as it replaces the traditional word ‘reference desk’ which connotes esoteric scholarly consultation on bibliographic references at a single physical service point which is isolated from the learning activities of the academic community (Somerville & Schader 2005). The RISE system architecture is also significant because it reflects the need for both a continuous information exchange (RISE forum) and a domain knowledge database (course assignments). The latter is obtained by information specialists who, in conversation with

academic faculty, probe course learning outcomes and procure course library assignments which they annotate with ‘solutions and strategies’ for implementation by information and instructional service support staff at the newly named ‘research help desk’.

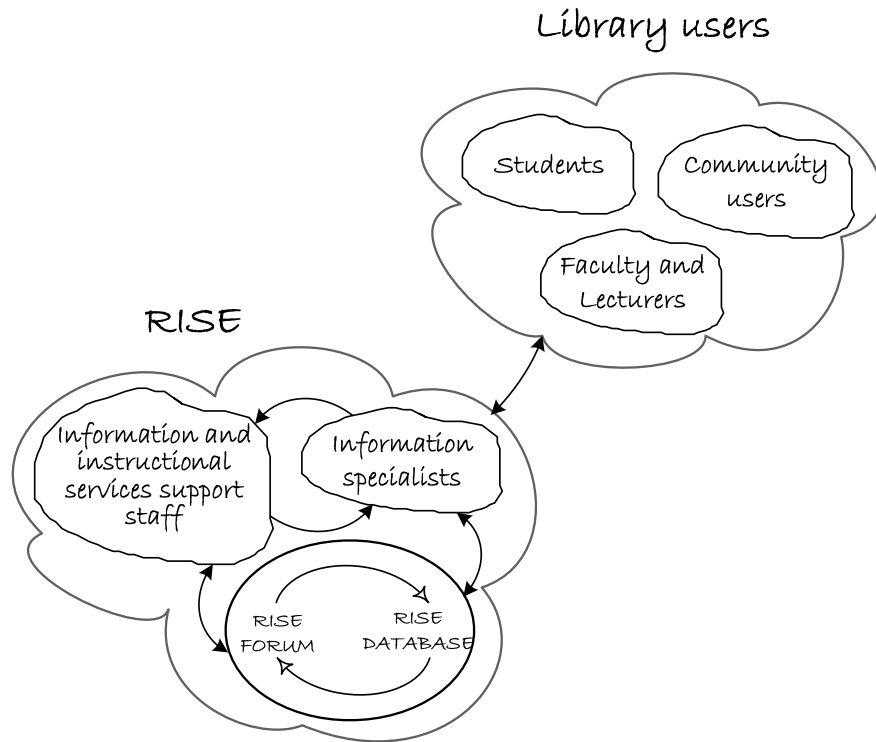


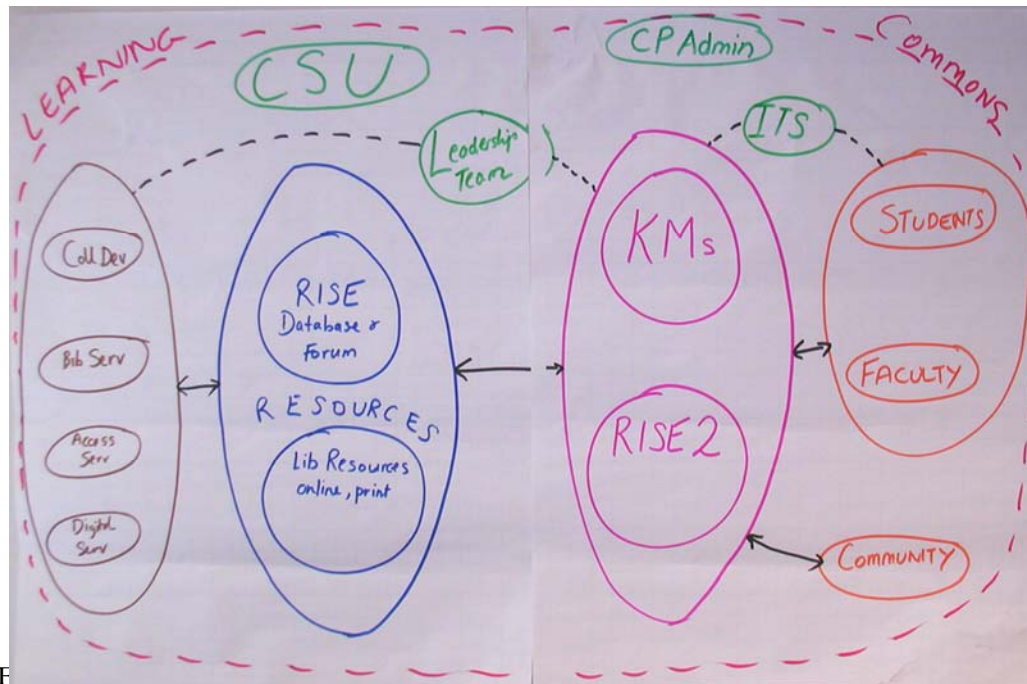
Figure 6: Interactive Processes of the Initial Research and Information Service and Education (RISE) System

Finally, the two-way communication between librarians/information specialists and support staff is expressed through the ongoing education, informally occurring throughout the workplace and formalized in weekly training and education sessions which anticipate students’ assignment-based help needs. This forward looking, technology-enabled decision-support system presents a sharp contrast to traditional ‘reference desk’ assumptions whereby questioners were expected to come to librarians ‘sitting at the desk.’ Instead, information specialists move beyond library walls to forge relationships that influence faculty members’ assignments and thereby enrich student learning experiences. In addition to coaching library staff members who assist students in completing assignments successfully, information specialists also design and deliver disciplinary web pages and digital learning objects that introduce essential information resources and search strategies. They also participate in a consortial virtual research ‘live chat’ service that provides personalized 24/7 online advisement to students, ‘any time, any place’.

Meaning Making for the Larger Organizational Context

In an evaluation session held at the end of this three year action research study, the external coach invited all library participants to apply ‘soft’ systems principles and practices to depict their enlarged workplace context. Their conceptions were captured in visual SSM-like drawings which provided a common reference for renegotiating increasingly more complex organizational nuances, as well as larger and larger boundaries of influence and concern. Illustrative of the renderings, the Rich Picture in Figure 7 presents an enterprise level model of university interactions – including consideration of what parts and relations to include – e.g., hierarchical levels, main processes, main beneficiaries, relevant perspectives, and leading questions.

The figure illustrates further transformation in thinking enabled by cumulative SSM rethinking activities. For instance, the information specialists have begun to refer to themselves as knowledge managers (KMs). They depict themselves in the same group as RISE 2, which refers to an enlarged group of information and instructional services support staff whose transformation processes were reported earlier in this section. To the right, the relationship to students and faculty are envisioned. Another circle indicates the need to also serve the community. The drawing on the left indicates recognition that both these groups, information specialists/knowledge managers and research information and instructional services/support staff, interact with internal and external library (digital) resources which, the left most drawing illustrates, are acquired and organized by staff in roles related to ‘back room’ functions, e.g., collection development and bibliographic services – and made accessible by information technology specialists. Finally, at the top of the figure, the relationships with university administration, campus information technologists, and the library leaders are acknowledged, as is the California State University system in which this university serves as one of twenty three campuses. This high level ‘system’ is termed ‘Learning Commons’ – a term which refers to a physical, technological, social, and intellectual place (or space) for collaborative learning (Somerville & Harlan 2007).



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As this figure demonstrates, one of the most profound outcomes of this three year rethinking project is clarification of workplace participants' relationships to internal and external stakeholders. These insights emerge quite naturally, as one of the defining characteristics of SSM practice is intentionally entertaining multiple perspectives. Furthermore, by its very nature, Soft Systems Methodology creates a relational context that encourages individuals' recognition of the aspects of their workplace expertise which, when shared, advances collective knowledge creation and integration (Checkland 2000).

Discussion and Way Forward

In consultation with the group leader, an action researcher coached participants on Soft Systems Methodology (SSM) thinking philosophy, methodology, and tools. As described in the preceding sections, library employees used systems thinking to successfully respond to changing circumstances that demanded re-invention of workplace purposes, processes, and practices. In this case, the call to action was precipitated by recognition that the organization's role had shifted from organizing print collections for potential usage to ensuring digital information access and usage for knowledge creation. As employees acquired new knowledge, skills, and abilities, they extended their boundaries of concern and influence to participate more fully in the teaching and learning activities of the university. As Midgley (2000) explains it, systems thinking philosophy

highlights the bounded nature of all understandings and refocuses attention on comprehensiveness as an ideal. In addition, as Ackoff notes about the social nature of learning: “all learning derives from experience, own and others’ (Ackoff 1998: 35). This notion informed encouragement of information exchange among project participants and with campus stakeholders.

Throughout, SSM tools were used to chart road maps for navigating unknown terrains. For instance, the quintessential elements of systems thinking – processes, purposes, relationships, and emergent properties – comprised the ‘tool kit’ for initiating and sustaining technology-enabled innovations. The application of the POM methodology, in particular, prompted fresh interpretation of everyday workplace activities which facilitated improved alignment of a socio-technical information system with internal and external environments. Furthermore, the systems thinking processes inherently encouraged the ongoing information exchange requisite to knowledge enablement and integration. Also, over the course of the three year project, system design and redesign initiatives progressively reflected the methodology’s four part cycle: initiating dialogue, creating meaning, forming intentions, and taking action, prompting the observation – in the words of Jackson (2000: 423) – that “perhaps the main strength of systems ideas ... is the guidance they offer to practitioners”.

The real world implications for this organization’s interactive design approach were amplified by the action research intentions which involved project participants in forging robust learning relationships with system beneficiaries. In the process of engaging in conversations and dialogue, they reconsidered their purpose(s) within the higher education enterprise and, subsequently, re-invented their roles and responsibilities, processes and relationships. Of necessity, this required engagement with and appreciation for multiple perspectives and situations. Shared commitment to build upon these diverse viewpoints improved the workplace inclusivity climate.

This holistic systems thinking framework now guides day-to-day work activities. Project participants share a common language and tools for discussing and analyzing complexities and interdependencies through finding out, modeling, comparing, and taking action. Rich dialogue-generated context guides iterative processes for evaluating meaningful data, comparing and contrasting multiple interpretations, and infusing reflective insights – and unsolved curiosities – into a continuous learning process that challenges existing ways of seeing and doing things. On a more technical level related to the use of SSM methods and tools, simple visual Rich Picture techniques continue to elicit individuals’ authentic conceptions and, through comparison, advance organizational learning.

In addition, modeling of interacting relationships remind participants about the function of the specific part in relation to the whole. As this case demonstrates, such everyday practices facilitated improved alignment of a socio-technical information system with internal and external environments. It also encouraged

ongoing information exchange and knowledge integration. Additionally, element 7 of the POM model, representing information and communication technology (ICT), ensured horizontal information exchange, including mediated organizational conversations as expressed in elements 3-4-5, to create meaning, support intentions, and negotiate accommodations.

An 'ideal' organizational system design approach (Ackoff 2001), therefore, must be sufficiently robust to facilitate varying modes of communication, further appreciation of differing perspectives, and forge common frames of reference. Furthermore, employees must be enabled to continuously modify organizational purposes according to dynamically changing circumstances. This includes, but is not limited to, forging the sustainable relationships with user constituencies that guarantee ongoing feedback and enable authentic interpretations.

Conclusion

Within the context of fundamental changes in higher education across the globe, this replicable approach for stimulating co-design collaborations aims to initiate relationships, enable inclusivity, and advance learning. This participatory action research approach is based in Soft Systems Methodology (SSM). Project results illustrate the efficacy of SSM models and techniques for the workplace 'meaning making.' In this case, diverse values, viewpoints, situations, and competences intentionally fueled organizational learning.

In this study, SSM's interactive, user-centered design methods were found to be imminently adaptable to a variety of information and communication technology (ICT) projects. Its qualitative nature especially encouraged user-designer interaction and collaborative workplace insight. Findings suggest the following transferable elements of this 'soft' co-design approach for information environments, systems, and tools:

- A philosophy based on user-centric, inquiry based relationship building to enable participants' learning;
- A process which builds on 'user as researcher' collaborations that produce organizational decisions based on 'authentic voice' insights; and
- An outcome – through collaborative (re)design – which focuses on initiating dialogue-based interactions that, in turn, inform sustainable organizational processes for continuous improvements.

Our experiences suggest that, in addition to introducing systems thinking tools, organizational learning is best advanced through reflection and dialogue. Over time, these workplace practices can foster inclusivity among co-workers and with campus stakeholders, as individual and collective constructs expand through robust appreciative exchanges.

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References

- Ackoff, R. L. (1998). "A systemic view of transformational leadership", *Systemic Practice and Action Research*, vol. 11, no. 1, pp. 23-36.
- Ackoff, R. L. (2001). "A brief guide to interactive planning and idealized design". Available <http://www.sociate.com/texts/AckoffGuidetoIdealizedRedesign.pdf>
- Argyris, C., and Schön, D. (1991). "Participatory action research and action science compared", in W. F. Whyte (ed.), *Participatory action research*, pp. 85-96, Sage Publications, Newbury Park, California.
- Association of College and Research Libraries. (2000). "Information literacy competency standards for higher education", American Library Association, Chicago, Illinois. Available <http://www.ala.org/ala/acrl/acrlstandards/standards.pdf>
- Banathy, B. H. and Jenlink, P. M., eds. (2005). *Dialogue as a means of collective communication*. Kluwer Academic/Plenum Publishers, New York City, New York.
- Baskerville, R. L., and Wood-Harper, A. T. (1998). "Diversity in information systems action research methods", *European Journal of Information Systems*, vol. 7, pp. 90-107.
- Bergvall-Kåreborn, B., and Grahn, A. (1996). "Multi-modal thinking in soft systems methodology's rich pictures", *World Futures*, vol. 47, pp. 79-92.
- Bergvall-Kåreborn, B., Mirijamdotter, A., and Basden, A. (2004). "Basic principles of SSM modeling: An examination of CATWOE from a soft perspective", *Systemic Practice and Action Research*, vol. 17, no. 2, pp.55-73.
- Brown, J. S. and Adler, R. P. (2008). "Minds on fire: Open education, the long tail, and Learning 2.0", *EDUCAUSE Review*, vol. 43, no. 1, pp. 16-32.
Available <http://www.johnseelybrown.com/mindsonfire.pdf>
- Bruce, C. (1997). "The relational approach: A new model for information literacy", *The New Review of Information and Library Research*, vol. 3, pp. 3 – 22.
- Checkland, P. B. (1979). "Techniques in 'soft' systems practice part 1: Systems diagrams - some tentative guidelines", *Journal of Applied Systems Analysis*, vol. 6, pp. 33-40.
- Checkland, P. B. (1981). *Systems thinking, systems practice*. John Wiley & Sons, Chichester, UK.
- Checkland, P. B. (1985). "From optimizing to learning: A development of systems thinking for the 1990s", *Journal of the Operational Research Society*, vol. 36, no. 9, pp. 757-767.
- Checkland, P. B. (1994a). "Conventional wisdom and conventional ignorance: The revolution organization theory missed", *Organization*, vol. 1, no. 1, pp. 29-34.
- Checkland, P. B. (1994b). "Systems theory and management thinking", *American Behavioral Scientist*, vol. 38, no. 1, pp. 75-91.

- Checkland, P. B. (2000). "Soft systems methodology: A thirty year retrospective", *Systems Research and Behavioral Science*, vol. 17, no. S1, pp. 11-58.
- Checkland, P. B., and Casar, A. (1986). "Vickers' concept of an appreciative system: A systemic account", *Journal of Applied Systems Analysis*, vol. 13, pp. 3-17.
- Checkland, P. B., and Holwell, S. (1993). "Information management and organizational processes: An approach through soft systems methodology", *Journal of Information Systems*, vol. 3, pp 3-16.
- Checkland, P. B., and Holwell, S. (1998a). *Information, systems and information systems - making sense of the field*. John Wiley & Sons, Chichester, UK.
- Checkland, P. B., and Holwell, S. (1998b). "Action research: Its nature and validity", *Systemic Practice and Action Research*, vol. 11, no. 1, pp. 9-21.
- Checkland, P. B., and Poulter, J. (2006). *Learning for action. A short definitive account of soft systems methodology and its use for practitioners, teachers and students*. John Wiley & Sons, Chichester, UK.
- Checkland, P. B., and Scholes, J. (1990). *Soft Systems Methodology in Action*. John Wiley & Sons, Chichester, U.K.
- Churchman, C. W. (1971). *The design of inquiring systems: Basic concepts of systems and organization*. Basic Books, London, UK.
- Churchman, C. W. (1984). *The systems approach*. Dell Publishing Co, New York.
- Davis, H. L., and Somerville, M. M. (2006). "Learning our way to change: Improved institutional alignment", *New Library World*, vol. 107, no. 3/4, April, pp. 127-140.
- Dewey, B. J. (2004). "The embedded librarian: Strategic campus collaborations", *Resource Sharing & Information Networks*, vol. 17, no. 1/2, pp. 5-17.
- Dick, B. (2004). "Action research literature. Themes and trends", *Action Research*, vol. 2, no. 4, pp. 425-444.
- Elden, M., and Levin, M. (1991). "Cogenerative learning: Bringing participation into action research", in W. F. Whyte (ed.), *Participatory action research*, pp 127-142. Sage Publications, Newbury Park, California.
- Elrod, S., and Somerville, M. M. (2007). "Literature based scientific learning: A collaboration model", *Journal of Academic Librarianship*, vol. 33, no. 6, pp. 684-691.
- Flood, R. L. (1998). "Action research and the management and systems sciences", *Systemic Practice and Action Research*, vol. 11, no. 1, pp. 79-101.
- Flood, R. L., and Jackson, M. C. (eds.) (1991). *Creative problem solving: Total systems intervention*. John Wiley & Sons, Chichester, UK.
- Flood, R. L., and Romm, N. R. A. (1996). *Diversity management: Triple loop learning*. John Wiley & Sons, Chichester, UK.
- Gillette, D. D., and Somerville, M. M. (2006). "Toward lifelong 'knowledge making': Faculty development in the Cal Poly Learning Commons", in D. Orr, F. Nouwens, C. Macpherson, R. E. Harreveld, and P. A. Danaher (eds). *Lifelong Learning - Partners, Pathways, and Pedagogies: Proceedings of the 4th International Lifelong Learning Conference*, Yeppoon, Australia, pp. 117-123. Central Queensland University, Rockhampton, Queensland, Australia.
- Jackson, M. C. (2000). *Systems approaches to management*. Kluwer Academic/ Plenum Publishers, New York.
- Jackson, M. C. (2003). *Systems thinking: Creative holism for managers*. John Wiley & Sons, Chichester.

- Lewis, P. J. (1992). "Rich picture building in the soft systems methodology", *European Journal of Information Systems*, vol. 1, pp. 351-360.
- Lippincott, J. K. (2005). "Net Generation students and libraries", in D. G. Oblinger and J. L. Oblinger (eds). *Educating the Net Generation*, pp. 13.1 – 13.15. *EDUCAUSE*, Boulder, Colorado. Available: <http://www.educause.edu/EducatingtheNetGeneration/5989>
- Midgley, G. (2000). *Systemic intervention: Philosophy, methodology, and practice*. Kluwer Academic/Plenum Publishers, New York.
- Norum, K. E. (2001). "Appreciative design", *Systems Research and Behavioural Science*, vol. 18, pp. 323-333.
- Rapoport, R. (1970). "Three dilemmas of action research", *Human Relations*, vol. 23, pp. 499-513.
- Rogers, E., Somerville, M. M., and Randles, A. (2005). "A user-centered content architecture for an academic digital research portal", in P. Kommers and G. Richards (eds.), *Proceedings of ED-MEDIA 2005 – World Conference on Educational Multimedia, Hypermedia, & Telecommunications*, Montreal, Canada, pp. 1172-1177, Association for the Advancement of Computing in Education, Chesapeake, VA.
- Rose, J. (2002). "Interaction, transformation and information systems development - an extended application of soft systems methodology". *Information Technology & People*, vol. 15, no. 3, pp. 242-268.
- Somerville, M. M., and Harlan, S. (2007). "From information commons to learning commons and learning spaces: An evolutionary context", in B. Schader (ed.), *Learning Commons: Evolution and Collaborative Essentials*, pp. 1-36. Chandos Publishing Ltd, Oxford, England.
- Somerville, M. M., and Schader, B. (2005). "Life after the reference desk: Co-creating a digital age library", *The Charleston Advisor*, vol. 7, no. 1, pp. 56-57.
- Somerville, M. M., and Vuotto, F. (2005). "If you build it with them, they will come: Digital research portal design and development strategies", *Internet Reference Services Quarterly*, vol. 10, no. 1, pp. 77-94.
- Stacey, R. (2003). "Learning as an activity of interdependent people", *The Learning Organization*, vol. 10, no. 6, pp. 325-331.
- Susman, G., and Evered, R. (1978). "An assessment of the scientific merits of action research", *Administrative Science Quarterly*, vol. 23, no. 4, pp. 582-603.
- Varey, R. J. (2005). "Informational and communicational explanations of corporations as interaction systems", in M. Wiberg (ed.) *The Interaction Society: Practice, Theories and Supportive Technologies*, pp 139-170. Information Science Publishing, Hershey PA.
- Vickers, G. (1983a). *The art of judgment. A study of policy making*. Harper & Row Ltd, London, UK.
- Vickers, G. (1983b). *Human systems are different*. Harper & Row Ltd, London, UK.
- Whyte, W. F., Greenwood, D. J., and Lazes, P. (1991). "Participatory action research through practice to science in social research", in W. F. Whyte (ed.), *Participatory action research*, pp. 19-55. Sage Publications, Newbury Park, California.
- Wilson, B. (2001). *Soft systems methodology: Conceptual model building and its contribution*. John Wiley & Sons, Chichester, UK.
- Windham, C. (2005). "Father Google and Mother IM: Confessions of a Net Gen Learner", *EDUCAUSE Review*, no. September/October, pp. 43-58.
- Windham, C. (2006). "Getting Past Google: Perspectives on Information Literacy from the Millennial Mind", in D. Oblinger (ed.) *EDUCAUSE Learning Initiative (ELI) September*, Paper 3.