WALDEN UNIVERSITY

Core Knowledge Area Module 1:

Principles of Societal Development

Student: Richard E. Biehl
Program: Applied Management & Decision Sciences
Specialization: Leadership and Organizational Change
First Assessor: Dr. Gary Gemmill

November 2001

Core KAM 1: Principles of Organizational and Social Systems

SBSF 8110 - Theories of Societal Development

Abstract - Breadth

The breadth component outlines the core principles of societal development, emphasizing the classification of the range of theories available and how those theories differ in their perspectives and underlying assumptions. Details of modernist functionalist theories are explored in more detail, leading up to the transition from modernist to postmodernist thinking that challenges many of the primary considerations that provide the structures against which these theories have been delineated.

Core KAM 1: Principles of Organizational and Social Systems

SBSF 8122 - Cross-cultural Aspects of Organizational Change

Abstract - Depth

The depth component explores the postmodernist view of traditional societal development theories and details the symbolic-interactionist approach as an alternative to the structural-functionalist view highlighted in the breath component. A framework for understanding change and social relationships in the software engineering profession is developed and symbolic-interactionist implications of that framework are identified.

Core KAM 1: Principles of Organizational and Social Systems

SBSF 8132 - Professional Practice and Organizational Change

Abstract - Application

A set of software engineering organizational assessment instruments are developed and piloted based on the role and perception of personal beliefs and meanings highlighted using the symbolic-interactionist model. These instruments indicate that structural-functional models for improvement as they are used in the software engineering community can be mediated or enhanced by tools based on interactionist principles as a supplement to structural models.

Walden University **Doctor of Philosophy Program of Study**

Name: **Richard E. Biehl** Student ID Number: **062-50-5682** Enrollment Date: **December 1999**

Program: **AMDS** Specialization: **Leadership and Organizational Change**

	Course Number	Course Title	Quarter to Be Taken	Credits	
Core KAMs					
	SBSF 8110	Theories of Societal Development	Winter 2000	5	***Drafted***
	AMDS 8122	Cross-cultural Aspects of Organizational Change	Winter 2000	5	***Drafted***
	AMDS 8132	Professional Practice and Organizational Change	Spring 2001	4	***Drafted***
	SBSF 8210	Theories of Human Development	Spring 2001	5	***Active***
	AMDS 8222	Leadership and Human Development	Spring 2001	5	***Active***
	AMDS 8232	Prof. Practice in Leadership and Human Development	Summer 2001	4	***Active***
	SBSF 8310	Theories of Organizational and Social Systems	Summer 2000	5 Done	
	AMDS 8322	Current Research in Organizational Systems	Fall 2000	5 Done	
	AMDS 8332	Professional Practice and Organizational Systems	Winter 2000-2001	4 Done	
	SBSF 8417	Research Seminar I: Human Inquiry & Science	Winter 1999-2000	4 Done	
	AMDS 8427	Research Design in AMDS	Spring 2000	5 Done	
	AMDS 8437	Data Analysis in AMDS Research	Summer 2000	5 Done	56
Advanced KAMs					
	AMDS 8512	Classical and Emerging Paradigms of Leadership	Summer 2001	5	
	AMDS 8522	Current Research on Leadership Development	Summer 2001	5	
	AMDS 8532	Application of a Theory of Leadership Development	Fall 2001	4	
	AMDS 8612	Model of Organizational Change & Development	Summer 2001	5	
	AMDS 8622	Current Research Model Org Change & Development	Transfer In	0 Done	
	AMDS 8632	Application of an Organizational Change Model	Transfer In	0 Done	
	AMDS 8712	The Case Study as a Research Technique	Summer 2001	5	
	AMDS 8722	Case Study Research in Leadership and Org. Change	Fall 2001	5	
	AMDS 8732	Leadership or Organizational Change Case Study	Winter 2001-2002	4	33
Electives					

Transfer Credits

Course Number	Course Title	Quarter	Years	Institution	Grade	Credits
ECTI Program	Walden ECTI	-	1997-1999	Walden University	4.0	9 Done

Total Credits: 9

Dissertation: Implications of Systems and Complexity Theory on Organizational Process Maturity — 30

Minimum Quarters of Enrollment: 10 — Grand Total Credits: 128

Student's Signature: Richard E. Biehl Date: Status as of October 12, 2001

FYA/FM Signature: _____ Date:_____

Program Director's Signature:_____ Date:_____

VPAA's Signature:_____ Date:_____

Learning Agreement Approval Form

Received via e-mail on February 1, 2001…

Just a quick note to inform you that your KAM 1 Learning Agreement was approved and processed by OAA. Please keep a copy of this message for your records, and don't forget to enclose a printout of this confirmation with your completed KAM. - Stacey

X-Sender: ggemmill@waldenu.edu
X-Mailer: QUALCOMM Windows Eudora Pro Version 3.0.3 (32)
Date: Wed, 31 Jan 2001 17:58:24 -0500
To: Richard Biehl <rbiehl@waldenu.edu>
From: "gary r. gemmill" <ggemmill@waldenu.edu>
Subject: Re: KAM Learning Agreement Submission
Cc: la@waldenu.edu

First assessor comments:
I approve this LA for KAM 1 submitted by Richard Biehl.
Gary Gemmill

Student Information
Submission date: 01/31/01
Student name: Richard Biehl
Student email address: rbiehl@waldenu.edu
Student phone number: 407.296.6900
KAM Information
1st Assessor: ggemmill@waldenu.edu
Track: AMDS
Specialization: Leadership
Faculty mentor: Dr. Gary Gemmell
KAM number: 1
Initial KAM: No,_not_initial_KAM
KAM title: PRINCIPLES OF SOCIETAL DEVELOPMENT
Estimated completion date: 05/15/01

Approved Learning Agreement

Learning Agreement

Core KAM 1: Principles of Societal Development

Student: Richard E. Biehl
Program: Applied Management & Decision Sciences
Specialization: Leadership and Organizational Change
Faculty Mentor: Dr. Gary Gemmill
KAM Assessor: Dr. Gary Gemmill

Learning Agreement Submission: February 2001
Targeted Completion for KAM: May 2001

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Learning Agreement

Core KAM 1: Principles of Societal Development

Introduction

This Learning Agreement for Core KAM 1, Principles of Societal Development, describes my plan of study for the AMDS core knowledge area on societal development and organizational change.

This KAM allows me to explore an issue about which I have been thinking for several years; namely, that the scale of an organization relative to the society in which it is embedded may be a central determinant of how that organization will identify and implement change in itself and its relationship with its environment. This idea originated in my masters thesis work at Walden from 1997-1999. In that research, I compared and contrasted change models in education and business using quality management principles related to customers and suppliers. I found that the typical TQM model of differentiating customers and suppliers from the organization, and optimizing relationships with each, didn't apply well to educational change initiatives. The difference seemed to be the relative scale of the organizations being discussed. The model worked well for change in the classroom, but grew less appropriate as the scale was broadened from classroom, to school, to district, to system. As the scale of the system being discussed grew closer to the scale of the society in which it was being analyzed, the distinctions between customer and supplier broke down as those constituencies increasingly overlapped. The traditional TQM model failed to describe the interactions being studied. I ended that study by suggesting a need for further research on this topic.

While this KAM will not constitute original research in this area, I would like to further explore social change theories related to such ideas. The functionalist and structuralist schools of thought; exemplified by writers such as Ferdinand Tönnies, George Mead, Talcott Parsons, Robert Merton, and

Jürgen Habermas; offer perspectives that might well inform on my previous observations. I will use their views to better define and illustrate the relationship between organizational scale and organizational change models. I plan to use this definition to analyze change models in my own profession; information technology. The IT field has many formal change models against which organizations of different scale attempt to implement change. I will use my application component to explore features of these models against characteristics developed in the depth component to see how theory explains emergent practice.

Specific high-level objectives for this KAM are:

1. Compare and contrast the major theories of society and change exemplified by the writers generally classified as modernists and postmodernists; identifying components and aspects of those theories that generally inform change theory and practice today. (Breadth)

2. Synthesize and integrate the postmodern social theories based on functionalism and structuralism into a framework for discussing and understanding social change in organizations of various types and structures. (Depth)

3. Compare and evaluate several existing organizational change models in the information technology industry against the developed framework to explain the extent to which such a framework is useful for illuminating actual experiences in the use of those models. (Application)

SBSF 8110 - Theories of Societal Development

In the breadth component of this KAM, I would like to explore many of the current and recent theories of society that inform current thinking about organizations and change. This includes a broad survey of the major categories of such theories focusing on the modernist and postmodernist schools; setting up for the detail discussion of specific aspects of postmodernism that will follow in the depth component.

Specific breadth objectives are:

1. Explore and categorize the major theory groups that describe societal formation and change; emphasizing the expansion and growth of such theories through time.

2. Compare and contrast the major theories of society and change exemplified by the writers generally classified as modernists and postmodernists.

3. Identify components and aspects of postmodernist theories that generally inform social change theory and practice today.

Reference Materials

The reference materials for this breadth component include survey works that provide broad coverage of the theories of interest; anthology works that provide original, if limited, exposure to many of the writers associated these theories; and original analytical works to provide a richer detail to some of the core concepts. Examples of such works include:

Survey & Anthology Works

Bogardus, E. S. (1960). The development of social thought. New York: David McKay.

Lemert, C. (Ed.) (1999). Social theory: The multicultural and classic readings. Boulder, CO: Westview Press.

Parsons, T.; Shils, E.; Naegele, K. D.; & Pitts, J. R. (Eds.) (1961). Theories of society: Foundations of modern sociological theory. New York: Free Press.

Ritzer, G. (1991). Contemporary sociological theory. Third edition. New York: McGraw-Hill.

Turner, J. H. (1991). The structure of sociological theory. Fifth edition. Belmont, CA: Wadsworth Publishing.

Turner, B. S. (Ed.) (2000). The Blackwell companion to social theory. Second edition. Malden, MA: Blackwell Publishers.

Analytical Works

Ahrne, G. (1994). Social organizations: Interaction inside, outside, and between organizations. London: Sage Publications.

Blumer, H. (1990). Industrialization as an agent of social change: A critical analysis. New York: de Gruyter.

Boudon, R. (1986). Theories of social change: A critical appraisal. Berkeley, CA: University of California Press.

Gordon, T. J. (1992). Chaos in social systems. Technological Forecasting and Social Change, 45. 1-15.

Hesselbein, F.; Goldsmith, M. & Beckhard, R. (Eds.) (1997). The organization of the future. The Drucker Foundation Future Series. San Francisco: Jossey-Bass.

Hesselbein, F.; Goldsmith, M.; Beckhard, R.; & Schubert, R. F. (Eds.) (1998). The community of the future. The Drucker Foundation Future Series. San Francisco: Jossey-Bass.

Monane, J. H. (1967). A sociology of human systems. New York: Appleton Century Crofts.

Parsons, T. (1960). Structure and process in modern societies. New York: Free Press.

Parsons. T. (1971). The system of modern societies. Englewood Cliffs, NJ: Prentice-Hall.

Sutherland, J. W. (1973). A general systems philosophy for the social and behavioral sciences. New York: George Braziller.

Swedberg, R. (1998). Max Weber and the idea of economic sociology. Princeton, NJ: Princeton University Press.

Learning Demonstration

The result of this analysis will be a written position paper, of not less than 30 pages, that sets the stage for describing general social theories using systems concepts, outlines and contrasts the major social theory categories; and highlights the modernist and postmodernist schools of thought regarding social systems and change.

AMDS 8122 - Cross-cultural Aspects of Organizational Change

In the depth component of this KAM, I will further explore the principles of postmodern sociology developed in the breadth component; focusing specifically on aspects that appear to inform on change models used throughout my information technology (IT) industry today. The standard IT change models available to the industry, most notably the Capability Maturity Models from the Software Engineering Institute, do not specifically address sociological issues, yet most of their content rests on aspects of functionalism and interactionism discussed in the postmodernist literature. This depth component will explore the social theory issues raised in postmodern writings, and the application component will explore how those issues affect the use of such models in practice.

This analysis also requires elicitation of the basic sociology of the information technology industry in order to provide a framework for mapping and applying the postmodernists ideas being explored in the application component. Such elicitation will focus on cross-disciplinary differences between IT and non-IT jobs, cross-industry differences that look at how different industry patterns impact the social and cultural aspects of IT; and cross-cultural differences in the ways that these issues differ in various parts of the world.

Specific depth objectives are:

1. Compare and contrast the specific postmodern social theories based on structural-

functionalism and symbolic-interactionism.

2. Synthesize and integrate these theories into a framework for discussing and understanding social change in organizations of various types and structures.

3. Explore and evaluate how such a framework can be applied to a group of emerging information technology industry-specific social change models.

Reference Materials

The reference materials for this breadth component include specific works detailing the various postmodernist theories of interest, those defining and describing the sociology of the IT field, and those describing the various IT organizational change models that are the subject of the comparison in this depth component. Examples include:

Postmodernism

Jantsch, E. (1975). Design for evolution: Self-organization and planning in the life of human systems. New York: George Braziller.

Mead, G. H. (1982). The individual and the social self: Unpublished work of George Herbert Mead. D. L. Miller, Ed. Chicago: University of Chicago Press.

Merton, R. K. (1996). On social structure and science. Chicago, University of Chicago Press.

Parsons, T. (1954). Essays in sociological theory. Revised edition. New York: Free Press.

Ritzer, G. (1997). Postmodern social theory. New York: McGraw-Hill.

Smart, B. (1993). Postmodernity. London: Routledge.

Tester. K. (1993). The life and times of post-podernity. London: Routledge.

Tönnies, F. (1965). Community and society. New York: Harper Torchbooks.

Industrial Sociology

Burrell, G.; & Morgan, G. (1979). Sociological paradigms and organisational analysis: Elements of the sociology of corporate life. London: Heinemann.

Hohmann, L. (1997). Journey of the software professional: A sociology of software development. Englewood Cliffs, NJ: Prentice-Hall PTR.

Turner, B. S. (1994). Orientalism, postmodernism and globalism. London: Routledge.

Wiegers, Karl E. (1996). Creating a software engineering culture. New York: Dorset.

IT Industry Change Models

Humphrey, W. S. (1989). Managing the software process. Reading, MA: Addison Wesley.

Humphrey, W. S. (1995). A discipline for software engineering. Reading, MA: Addison Wesley.

Humphrey, W. S. (1999). Introduction to the team software process. Reading, MA: Addison Wesley.

Weber, C.V.; Paulk, M. C.; Wise, C. J.; & Withey, J. V. (1991, August). Key Practices of the Capability Maturity Model, Carnegie Mellon University: Software Engineering Institute. (Report # CMU/SEI-91-TR-25, ADA240604)

Learning Demonstration

The result of this analysis will be a written position paper, of not less than 20 pages, representing a synthesis of my focused readings and research of the above general materials; supported by an annotated bibliography of at least 15 recent sources in the peer-reviewed literature on the social aspects of change in the information technology field globally. There is a continuing rich and diverse literature base in this area that has grown extensively over the past decade.

AMDS 8132 - Professional Practice and Organizational Change

In the application component of this KAM, I would like to apply the functional and structural characteristics explored in the depth component to the collection of actual industry-focused change models used in my industry: information technology. I'm interested to see how such theories explored in the breadth and depth components can be used to explain and inform actual industry experiences in applying such change models.

The models to be analyzed are available from the Software Engineering Institute at Carnegie Mellon University, and were developed under various research contracts from the United States Department of Defense. The models look at individual, team, and organizational change in the information technology industry as a function of the existing process maturity of the individuals, teams, or organizations undergoing such change. Versions of these models look at the spectrum from personal core competency development out to total system change. Collectively these models are known throughout the industry as the Capability Maturity Models (CMMs).

The multiple scales on which these change models apply and are used offers an opportunity to observe characteristics of the functional and structural models of change impacting organizations on these very different scales. Such differences offer me the opportunity to explore the initial issue I raised above; the impact of organizational scale on the planning and execution of change in the organization. Additionally, because the different Capability Maturity Models are used throughout the world, my analysis offers an opportunity to look at possible cultural factors affecting their use. In particular, there seem to be differences between how these models are applied in Japan and the United States. The social and cultural patterns identified for the IT field in the depth component may explain or illuminate such differences.

Specific application objectives are:

1. Develop a planning instrument for implementing social change in an organization that uses the framework developed in the depth component.

2. Test and evaluate that instrument in an actual organization undergoing social change using the models discussed in the depth component.

3. Present the tested framework instrument at a professional conference and publish the resulting instrument and presentation in its conference proceedings.

Learning Demonstration

The result of this application component will be a 75-minute presentation offered at the QAI International IT Quality Conference in Orlando, Florida on Wednesday, April 25, 2001. As a follow-up to that presentation, I will participate in a 75-minute panel discussion on Thursday, April 26, 2001 during which time conference attendees can ask further questions regarding my presentation. The content and handouts for my presentation will be published in the conference proceedings, and will be attached to this KAM. I will supplement this material with a 5-10 page write-up of the process followed in creating and offering this presentation, as well as thoughts on some next steps that might be taken to further validate and improve the resulting instrument.

Self-Evaluation: Knowledge Area Modules (KAMs)

Student Name: Richard E. Biehl Date: November 2001

KAM: #1 Title: Principles of Societal Development

1. What knowledge/experience did you bring to this KAM? How did you capitalize/expand on this base?

I am an experienced corporate consultant in the disciplines of organizational development and change. Most of my experience is in dealing with traditional models developed from a structural-functional perspective. My ECTI experience at Walden laid the groundwork for me to adopt and work with a broader range of change encompassing a more variety set of dimensions and variables. This KAM allowed me to exercise some of those principles beyond the education arena.

2. Describe the quality of the **Breadth** section in the light of the intellectual and communication skills demonstrated in this KAM.

The breadth component is a very broad survey that covers a great deal of territory. Adapting the Burrell and Morgan framework provided the structure necessary for such a broad survey to stay on a central theme, allowing it to focus and move toward the specific theories to be explored in the depth component while keeping the broad survey focus. To narrow a direction would have caused the depth component to become more of a pre-depth component; which is not what it was meant to be. The scope of the breadth is wide enough that any number of depth components could have been drawn from it; making it a useful resource as part of my literature review for my dissertation proposal work to be conducted this winter.

3. In the **Depth** section, what key ideas/concepts most engaged your thinking and imagination relative to your area of study?

Application of symbolic interactionism toward explaining the generally perceived failure of existing change models based on structural-functionalism. There seems to be little wrong with the models themselves; rather the paradigms against which they are implemented need to be challenged and expanded or changed.

4. Expound on the most meaningful theoretical construct studied and applied to your professional setting in the **Application** section. What can you do differently/better as a result of this KAM?

I was most affected by the finding of the role of perception and meaning as mediating between demands placed on people and their actual resulting behaviors. Management theory all but ignores this dimension in my fields of practice. Adopting this view immediate illuminates many problems and situations with which I've struggled for a long time. I'll approach many aspects of my own professional practice in different ways because I am able to anticipate, see, and affect this previously hidden dimension of the problems I deal with.

5. Briefly describe the most important **Social Issue** covered in this KAM.

The meaning and satisfaction that professionals can get out of their work in disciplines that are often considered dry and dehumanizing by experienced practitioners is exciting. To the extent that many in modern society experience a least some of these negative affects, changes based on altered paradigms can enrich the lives of many; even while enhancing the value and productivity of the very organizations that have been perceived as driving the negative effects being discussed. Economic capitalism can coexist with social capitalism.

WALDEN UNIVERSITY

Core Knowledge Area Module 1:

Principles of Societal Development

SBSF 8110 - Theories of Societal Development

Student: Richard E. Biehl
Program: Applied Management & Decision Sciences
Specialization: Leadership and Organizational Change
Assessor: Dr. Gary Gemmill

November 2001

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Chapter 1

Introduction

Overview

This knowledge area module looks at social theories as a means of identifying the dimensions and variables that can be used to discuss and explore real-world social and organizational models in the information technology industry. Change models in the information technology industry typical take the form of normative descriptions of how organizations should be structured, or prescriptions as to how processes and procedures should be designed and implemented by those organizations. The social theories that underlie such models, indeed the reasons for the efficacy of those that succeed, virtually always remain unexplored; at least unstated. This knowledge area module traces the development and shift in social theory – primarily from functionalism toward interactionism – to see if elements of the shift can illuminate the field of system change in the information technology industry.

Objectives

This breadth component lays a foundation based on a general exploration of many of the current and recent theories of society that inform current thinking about organizations and change. This includes a broad survey of the major categories of such theories focusing on the modernist and postmodernist schools; setting up for the detail discussion of specific aspects of postmodernism that will follow in the depth component. Specific breadth component objectives are:

1. Explore and categorize the major theory groups that describe societal formation and change; emphasizing the expansion and growth of such theories through time.

2. Compare and contrast the major theories of society and change exemplified by the writers generally classified as modernists and postmodernists.

3. Identify components and aspects of postmodernist theories that generally inform social change theory and practice today.

Summary

There is a great diversity among the various theorists who comprise the modern and postmodern schools of social theory. Burrell and Morgan (1979) offer a framework for organizing this diversity in which they characterize various theories into four quadrants; defined by their perspective continuums of regulation-change and subjective-objective assumptions. The dominant quadrant – the functionalist, based on objective regulation – provides the foundation theories for this knowledge area module. Over time, the popularity of any particular theorist varies; but Burrell and Morgan observe that the cornerstone of social theory generally remains within their functionalist paradigm. Park and Burgers (1972) describe the growth of functionalist sociology as the extension of the methods of the natural sciences to politics and history, increasing the precision of history and observation-based predictions. Government becomes a technical science, and politics a profession. (p. 62)

Discussion of social interactions and actors inevitably moves discussion away from Burrell and Morgan's objective end of the continuum that defines their framework, and toward the subjective end. The focus shifts from structure and function toward a more subjective interpretation, or emergent interaction, of and by the actors involved in the systems being discussed. These discussions take place among the writers that Burrell and Morgan place in their interpretive – or subjective regulating – conceptual quadrant. These subjective discussions allow for great depth in working through the beliefs, motivations, and intentions of the players in the social systems being discussed.

The shift from modern to postmodern social theories provides for a deeper and richer discussion of any of the positions targeted within the Burrell and Morgan paradigms. These deeper

perspectives, along with the interaction of the objective and subjective positions; the point at which Burrell and Morgan's quadrants touch; provides useful constructs for modeling organizational interactions that involve both the structure of formal objective processes and the informality of those processes being carried out by subjective interacting people.

Organizing Social Theories

Burrell and Morgan (1979) offer a framework for categorizing social theoretical models into four conceptual paradigms defined by two different dimensions of analysis: 1) the nature of society, and 2) the nature of social science. (see Figure 1) The framework allows individual social theorists to be placed into context according to the underlying assumptions present in their analysis.

Figure 1 – Burrell & Morgan's Paradigms of Social Theory (1979)

Society	Social Science: Subjective	Social Science: Objective
Radical Change	Radical humanist	Radical structuralist
Regulation	Interpretive	Functionalist

Boundaries between paradigmatic quadrants are arbitrary, and Burrell and Morgan describe significant cross-paradigm influences; although they conclude that the boundaries are actually too permeable because of the conceptual dominance of the functionalist paradigm. (p. 397-8) They advocate less short-term interaction among the paradigms in order to provide each an ability to mature ideas and establish themselves as independent "alternate realities." (p. 398) Their ideas are highly

suggestive of the postmodern debates that were just beginning to flow throughout the social science community in the late 1970's.

Nature of Society

Burrell and Morgan's depiction of the dimension dealing with the nature of society looks primarily at the distinction as to whether or not the society is depicted as a *status quo* to be described and defended or as an embodied change, focusing on the ongoing processes of maturity and growth. They describe this dimension as a continuum from regulation to radical change.

Social theories toward the regulation end of the continuum will discuss social order and consensus while depicting social interaction and group cohesiveness. Regulation looks at what actually is, and describes members of society satisfying needs through social mechanisms and relationships that actually exist within the society.

Theories of society more toward the radical change end of the continuum will discuss the potentialities that exist within the society; focusing on conflict, modes of domination and control, and the inherent contradictions and inconsistencies associated with on-going change.

Nature of Social Theory

Burrell and Morgan's description of their framework dimension dealing with the nature of social theory depicts the key distinction as the subjective-objective continuum. They offer four perspectives under which this continuum can be evaluated: 1) ontological, drawing a distinction between nominalism and realism at the two extremes; 2) epistemological, viewing anti-positivism and positivism as the extremes; 3) human nature, with the debate over volunteerism and determinism defining the extremes; and 4) methodological, with theories ranging from ideographic to nomothetic at the ends of the continuum. Having four perspectives; in contrast to their opposing dimension for the nature of society

with only one defined regulation-versus-change viewpoint; opens the door to confusion as individual social theories are mapped against the continuum. To the extent that individual theories map to a certain point on the continuum in each of the four perspectives, there is no *a priori* requirement that all four perspectives result in the same mapping.

Looking Ahead

Following on the framework established in this breadth component, the depth component will further explore the postmodern theoretical shift from structural functionalism toward symbolic interactionism. Using issues identified in these two specific disciplines, an accounting will be offered of the evolution of social and organizational models in the information technology industries. By mapping postmodernist principles to the specifics of several commonly used industry change models, the application component will then suggest a framework – in the form of planning/feedback surveys – that can be used by professionals involved with these industry models as they attempt to improve their effectiveness through making underlying social factors more visible and explicit.

Chapter 2

Functionalist Social Theories

Burrell and Morgan describe functionalism as the dominant framework for sociology in the twentieth century; heavily influenced by sociological positivism in which the principles of German idealism have been incorporated. (p. 48) The social theories that Burrell and Morgan place in their Functionalist Paradigm share several underlying common positions. (p. 106) They view society as basically available for study; ontologically independent of the presence of people. They view the social theorist as an observer of social phenomena, not as participant in what is being studied. They describe society in terms of on-going and continuous order; and they seek to explain aspects of society and the social fabric that can explain such continuity. They expect and find purposeful rationality in the individual and group behaviors encountered in their study.

Burrell and Morgan cluster the theories within the paradigm for convenience and comparison. Clearly there are differences among the theories that they include in these clusters; but they see the similarities within the paradigm as vastly overcoming such differences, particularly with respect to their other three framework paradigms. (p. 29)

Structural Functionalism

Structural functionalism looks at function as a emergent property of structure; whether in an organism or a broader society. Analysis focuses on the interrelationships of parts and the meeting of needs. Burrell and Morgan illustrate the origins of structural functionalism using the ideas and writings of Comte, Spencer, Durkheim, and Pareto. The biological analogy is strong among these writers. They extend their discussion to broader sociological applications through an analysis of Malinowski, Radcliffe-Brown, and Parsons.

Auguste Comte (1798-1857)

Burrell and Morgan describe Comte as the father of sociology. (p. 41) They describe his view that social development follows an evolutionary path involving three stages of development or maturity: 1) the theological or fictitious, 2) the metaphysical or abstract, and 3) the scientific or positive. He sees relationships and rationality as defining dimensions of analysis; with a strong inclination toward an analysis based on the principles of the natural sciences and the scientific method. This thinking leads to the functionalist paradigm with its emphasis on explanation of existing social order and regulation.

Comte (1875, p. 8) described his social analysis as not only applicable to outward practical life, but also to one's inner moral nature; carrying forward elements of the theological stage up to the positivist stage. He also argued that the interim metaphysical stage was never really able to supercede theology in questions of emotion and meanings; much less so in practical matters. His three stages should, therefore, be seen as a series of expansions, not of replacements. As this KAM explores the path from functionalism to interactionism, this recognition of feelings and meaning at the core of understanding will be a recurring theme.

Herbert Spencer (1820-1903)

Spencer picked up from Comte the importance of the relationship between structure and function, believing that parts need to be viewed in the context of the whole In addition, Spencer was heavily influenced by Darwin and developed his ideas based on a universal applicability of evolutionary principles. Spencer pursued the implications of such a biological analogy in identifying with society as organism. The properties of the aggregate society would then be determined by the individual units. The parallel between society and organism placed individuals into the role of component parts. The diversity of individuals, and the manner in which they were integrated into collective units, determined

the structure, and so function, of the society. This direct relationship between structure and function is what Burrell and Morgan describe as the root of structural functionalism. (p. 42)

Cohen (1968) describes Spencer as analyzing the structure of society in order to see how each part contributes to the functioning of society. Spencer argued that great differentiation of the parts in the structure would lead to greater interaction among those parts. Such diversity of interaction would better enable the society to survive because internal disharmony is decreased through the greater communication and integration of the parts. Under the evolutionary biological analogy, more complex societies should persist over simpler societies for the same reason that humans adapt to more environments than amoeba. (p. 34-5)

Peel (1971) argues that too much emphasis is placed on Darwinism when looking at Spencer's work as a biological analogy. (p. 131) Spencer didn't start out from a phenomenon to be explained as the evolutionary biologist had. Spencer saw ethical and metaphysical imperatives that could best be explored and explained using the evolutionary model. Many writers describe Spencer as applying evolution to society, while Peel sees Spencer as a sociologist making use of a particularly powerful model. (p. 134) Turner (1985) agrees, noting that Spencer was less concerned with the functions of particular structures than with the relationships necessary for maintaining a system's social whole. A Darwinian evolutionist perspective would have focused more on the pattern of structural differentiation among the parts. (p. 50-51)

Spencer recognized that society as organism couldn't be complete. As an organism the parts would cooperate and evolve together. They would not compete. However, competition among individuals in societal settings is persistent. Instead, society could be viewed as an ecological aggregate of subsystems. Within the ecology, subsystems/individuals would competitively struggle according to

Darwin's principles of evolution. Holding to his view of the applicability of evolution as a guiding model, Spencer saw that these ecological struggles would lead to integrated societal systems of greater and greater complexity.

Emile Durkheim (1858-1917)

Durkheim saw society as a concrete reality available for rational study; echoing Comte's positivism. He also pursued Spencer's organic analogy into the analysis of social institutions. He drew a distinction between causal and functional analysis and focused on the latter under a belief in a sociology of regulation; looking at relations between individuals and their social institutions and the emergence through those relations of social solidarity. In traditional pre-industrial societies, such solidarity would have been based on the sharing of work and resources in a conscious collective. In more modern industrial societies, increased division of labor would drive greater functional differentiation. Solidarity would come to be based more on relationships according to Spencer's organic model. The function of the whole becomes increasingly dependent upon the structure among the parts. Systems of values and beliefs would evolve to become normative as the organic whole enforced a strong predilection toward order and stability.

Vilfredo Pareto (1848-1923)

Pareto also emphasized society as a system of interrelated parts but also wanted emphasis placed on the irrationality of human behavior. Such behaviors would tend to disrupt the societal system by introducing disorder to Durkheim's stability. Pareto's response was a social systems model based on equilibrium, and he described the social system as tending to resolve disruptions. This placed society as responding to the external forces acting upon it; more of a mechanical than a biological analogy.

The social system is constantly in a state of dynamic change according to Pareto. (1935, p. 1435) The resulting state of equilibrium is always determined by the system reestablishing balance after being perturbed, along with some level of normal change. He argued (p. 1436) that if such were not the case, any normal state in the social system would be determined simply by random chance. He preferred a model where change would be limited or bound by existing or prior states. The social system, then, could simply be defined as that balanced state into which the system resolved itself after each disequilibria. Social factors and individual human acts then become part of the natural change in the system, often acting as disequilibria drivers.

Pareto's discussion of equilibrium is described by Powers (1986) as a balance between people's tastes, or desires that they are looking to satisfy, and the obstacles preventing or impeding such satisfaction. (p. 38) Such thinking is predicated on Pareto's underlying assumption that societies are actually systems of social relations. (p. 144) The equilibrium will be stable when changes in one part of the system affect changes in other parts that partially reverse or mitigate the original change. The equilibrium will be unstable when other modifications to the balance actually amplify any initial changes.

Powers described Pareto as laying out a long-term cycle of societal change, where equilibrium is only approximated in the short-term. Events affecting parts have consequences for the whole that are more dynamic than simple cause-effect thinking. Cycles of social sentiment have affects on economic productivity, which in turn impact political organization, which drives changes and conditions that affect social sentiment. Any invisible hand in the functioning of society is actually a systemic effect of the structure of these interactions. (p. 40)

Bronislaw Malinowski (1884-1942)

Malinowski added to the idea of the relationship between structure and function the importance of field-work and observation. Malinowski looked at the function of cultural artifacts in the satisfying of needs within observed groups. Cohen (1968) points out that such thinking is circular if needs are considered fundamental. An artifact can satisfy a need, but why *that* need? Observing need satisfaction doesn't address an understanding of needs, and so doesn't completely explain function. (p. 41)

Malinowski (1944) avoided such causative or normative looping, instead relying on simple observation of function to identify requisite needs, many of which he saw as basic needs, or those where the need being met was largely and directly attributable to the types of cultural responses being observed. (see Table 1)

Table 1 – Malinowski's Basic Needs (1944)

Basic need	Cultural response
Metabolism	Commissariat
Reproduction	Kinship
Bodily comforts	Shelter
Safety	Protection
Movement	Activities
Growth	Training
Health	Hygiene

(Adapted from discussion on p. 91)

A premise of his observation was that the biological drive inherent in every observed impulse could not be separated from the cultural tradition that set the context for the impulse observed. Behind every observed act was a "cultural determination." (p. 86) "It would be idle to disregard the fact that

the impulse leading to the simplest physiological performance is as highly plastic and determined by tradition as it is … by physiological necessities." (p 87)

Other observations of more complex phenomena, therefore, could be attributed to different societal imperatives that could be derived from the observed core basic needs. (see Table 2) All needs would result in some form of cultural response that could be observed, and an entire societal system would evolve to support those needs; although no particular societal systems was mandated by his thinking.

Table 2 – Malinowski's Derived Needs (1944)

Imperative	Cultural response
Goods produced, used, maintained, and replaced.	Economics
Codification and regulation of human behavior.	Social control
Human material must be formed and renewed.	Education
Authority must be defined and endowed with means.	Politics

(Adapted from discussion on p. 125)

His explanations suggested that special or unusual characteristics observed in society could best be explained by the functions that they performed for society. Structure isn't normative, needing to be discovered and explained. He regarded the society as a complete whole within a set of ecological surroundings. The functions performed across the society are necessary to that ecological balance, and can be used to understand existing observed structures. Burrell and Morgan point out that such a view can all too easily lead to a teleological perspective where the emergence of function is viewed as an evolutionary target. (p. 53) (They don't argue that this more extreme position was actually taken by

Malinowski.) Malinowski was a positivist; pointing out the relationship between function and structure without attributing design or causality to either.

A. R. Radcliffe-Brown (1881-1955)

Picking up from Comte and Spencer, Radcliffe-Brown (1952) worked with a concept of function rooted in the analogy between social and organic life. He drew upon Durkheim's parallels between biological organisms and human societies. He also accepted Malinowski's notion that no particular structure for society should be preferred to any other as long as a proper ecological balance exists. The function of any particular social institution existed in the correspondence between the institution and the needs of the social organism. (p. 178) Radcliffe-Brown preferred to use the idea of 'necessary conditions of existence' rather than the idea of 'need' in order to avoid the possible teleological interpretations often associated with discussions of needs in psychology. He accepted the use of descriptions of needs, but only within the narrower context of existence necessities. (p. 178)

Extending beyond this point though, he assumed that there must be some set of necessary conditions that must be satisfied in order for human societies to exist. Without such an assumption, the analogy between organisms and societies doesn't make sense. He described organisms as having a structure, not being that structure. Life is the continual functioning of that structure; the satisfaction of basic needs as preconditions for continuing existence. If societies lack such necessities, the analogy would break down. (p. 179)

He viewed society as a network of at least minimal relationships that must exist in order to provide social structure with basic continuity. Individuals form the essential units of analysis in that network. As with organic life, ongoing continuity is not destroyed by changing the individuals that interact in the network; any more than an organism is destroyed as its cells divide and replace

themselves. Such an ongoing and continuing existence for the society Radcliffe-Brown conceived as the continuing functioning of its structure; its social life.

"The continuity of structure is maintained by the process of social life, which consists of the activities and interactions of the individual human beings and of the organized groups into which they are united." (p. 180) Social life, then, is the functioning of the social structure: structural functionalism. The function of any recurring activity in the society is the part it plays in he social life as a whole, and therefore, the contribution that it makes to the ongoing and continuous maintenance of the structural community. Function, then, is structure interacting in a series of relations among constituent individuals in ways that provide for continuity of the structure.

Radcliffe-Brown described three sets of problems that social theorists needed to address within this framework: 1) the problem of the classification of the structure among parts, or social morphology; 2) the problem of explaining the functioning of those parts, or social physiology; and 3) the problem of explaining the development and existence of new societal types. (p. 179-80) Because the analogy is presumed to hold, these three problems apply to both organic and societal systems. He recognized two significant limitations in the organic analogy in conducting such analysis: 1) organic structures could be studied independent of their function, while societal structures could not, and 2) societies can change structural types while organisms cannot; highlighting the danger of pursuing the organic analogy too far. That a social system, as a collection of functional contributions, exhibits a functional unity that maintains a structure would serve as a hypothesis, rather than a factual assertion. (p. 181) The functional unity he described included all parts working together with enough internal consistency to avoid producing persisting conflicts that couldn't be resolved or regulated by the social system.

Continuing the analogy, Radcliffe-Brown described the study of organic pathology as dealing with dysfunction, and distinguishing the organisms health from disease. He posited that if there is an analogous form of social pathology – some group of laws of social physiology – it would likely be found behind the development of legal, political, economic, and religious systems. The functions within these systems clearly support the ongoing maintenance and continuity of the society in which their practices are carried out. (p. 182)

Radcliffe-Brown pointed out that his functional concept doesn't require that everything in social life have a function; only that every interaction be capable of being identified with some function. He also recognized that two instances of the same social interaction taking place in different societies need not serve the same function, if they serve any at all. Interactions aren't trying to perform society maintaining function; they simply do. Performed differently, they might still serve such a function, but not necessarily in a way that the society would be the same. Structural functionalism doesn't rationalize any particular social life, particularly those currently observed; it just explains the mapping of the social interactions through which a particular societies functions merge and sustain themselves. (p. 182)

Talcott Parsons (1902-1979)

Picking up on Radcliffe-Brown's idea that there must exist some minimum set of structural relationships and functions in order for a societal system to persist, Parsons focused on clarifying the problems that must be solved in order for a system to exist. Burrell and Morgan describe this as an inversion of Radcliffe-Brown. (p. 54) Parsons defined various imperatives that society must satisfy and then looked for social structures that would implement them; while Radcliffe-Brown would observe structure and then look for function that could be used to understand that structure. Both approaches

seem valid as long as the results aren't taken to be teleological from either perspective. Malinowski approached the imperative-structure questions from both sides using observation.

Using this approach, Parsons (1971, p. 5-6) identifies four imperatives that must be resolved by any social system in order to exist and persist: 1) adapting and establishing a relationship with its external environment; 2) goal attainment through the setting of goals and mobilizing of resources; 3) integrating the system through a set of controls that inhibit variations and maintain coordination; and 4) establishing latency, or pattern maintenance, through motivation of actors within the system. Since Parsons viewed these four functions as necessary for societal persistence, his views are highly normative. Society will be structured to provide the core functions necessary for societal persistence.

Parsons also identified two external, or environmental, systems that must also be considered as part of the structure within which social action occurs: a) the physical environment, primarily the world of physics and chemistry in which living organisms interact, and b) the "ultimate reality" (p. 6) derived largely from philosophy and religion and mediated primarily through the cultural system.

Only by denying that any particular structure across these six systems is required does Parsons avoid the teleological position that there is some inherent design required for a society to come into being. However, the need to maintain such minimal function will place limits on a society's ability to change. The interaction of his six subsystems is what brings Parsons to the edge of Burrell and Morgan's group of systems theories; and the role he ascribes to individual interactions among actors will bring Parsons back below in the discussion of their social action theories.

The need for society to regulate itself across and within these structural and functional configurations is what places these structural functionalist theories squarely in Burrell and Morgan's functionalist quadrant. However, they also point out that because these theories focus on maintaining

and regulating required functions, they have trouble explaining change and the emergence of new forms of societal structures. (p. 56) The heavy influence of the natural sciences on the direction and development of methods within functionalist sociology has driven the heavy objectivist focus of many of these writers.

Systems Theory

While recognizing that the concepts of 'structural functionalism' and 'systems theory' are often used interchangeably, Burrell and Morgan maintain the distinction between the two largely because systems theory encompasses heuristics and subject matter that go well beyond discussions of structure and function. (p. 57) In fact, aspects of their discussion are encompassing enough that one can be left wondering why they chose to introduce the topic as part of their discussion of their functionalist paradigm, rather than previewing their materials on the various paradigms with an interpretation of the role the see systems theory playing in their framework; for aspects of the analogies drawn in systems discussion involve principles and assumptions from each of their other three paradigms.

Burrell and Morgan describe five types of system analogies and their uses and impacts in discussions of social theory. (see Table 3) The principle tendencies of these five analogies define a continuum along the lines of the vertical dimension of their framework; with analogies based on order and stability defining the lower elements of their framework, and analogies based on conflict and change defining the upper elements.

Table 3 – Burrell & Morgan's System Analogies (1979)

Type of Analogy	Principle Tendency
Mechanical	Equilibrium
Organismic	Homeostasis
Morphogenic	Structure elaboration
Factional	Turbulent division
Catastrophic	Complete reorganization

Adapted from Figure 4.1 (p. 67)

Their mechanical and organic analogies have already been heavily drawn upon by the structural functional writers. The morphogenic analogy deals with the evolution of new systems; raised as an issue by Radcliffe-Brown, but remaining to be further elaborated by Burrell and Morgan along with the factional and catastrophic analogies in their discussion of their Radical Structuralism Paradigm.

Ludwig von Bertalanffy (1901-1972)

Burrell and Morgan attribute to von Bertalanffy the role of closed versus open system thinking in discussing complex systems such as large organizations or societal systems. (p. 57) They point out that social sciences tend to focus on the mechanical and biological analogies. This focus tends to result in an analysis based on input, throughput, and output. Key concepts will include homeostasis, negative entropy, differentiation, and equifinality. Structure will play a central role in an understanding if such systems. An analysis within a system will view the mutual interdependence of subsystems. Critical activities will be seen in terms of boundary transactions that allow the system to interact with its environment.

Such analogy-oriented concepts are important to the study of social systems, but they also limit the role that broader systems thinking can play, particularly with respect to the impact of the environment on the social systems. The mechanistic analogy focuses on equilibrium. The role of the

environment is seen primarily as a source of disequilibria, something to which the system must respond. "The possibility that environmental change may influence the very structure and essential nature of the system is negated to some extent by the assumption that equilibrium will eventually be restored" according to Burrell and Morgan. (p. 62)

A. R. Radcliffe-Brown (1881-1951)

Under this narrow view, the social system is seen as responding to its environment based on environmental impacts or stimuli based upon its needs. Radcliffe-Brown's ideas under structural functionalism viewed the system in terms of the needs that required fulfillment; such needs causing a functional unity among the components. Burrell and Morgan describe both Malinowski's and Radcliffe-Brown's use of the idea of homeostatic principles in describing social systems as open systems. (p. 63-64) Each described social affairs in terms of process; with the structure of the system representing the relationship between system parts and the environment at any point in time. The structure of the system would alter in response to changes in the environment in order to provide for the continued meeting of functional needs.

This relationship between structure and function underlying structural functionalism can be delineated using two of Radcliffe-Brown's problems areas introduced above: morphology and physiology. Social morphology looks at the structure of social systems with minimal view to function. Structural metrics such as mass or size, configuration of components, or centralization of authority can be described more-or-less independent of the functions such metrics serve. Social physiology looks more at the functions served than at the structures of the system. Parson's functional imperatives assign primary importance to such a view. Burrell and Morgan point out that the combination of morphology/structure and physiology/function can be used to describe the actions and behaviors of

social systems in which equilibrium has been achieved and is desired. (p. 64) A focus on such a status quo is central to the definition of their functionalist paradigm. It does not, however, deal with Radcliffe-Brown's third problem area, namely the modeling of social development or change.

The mechanistic and biological analogies often used when discussing social systems as systems can not deal with major changes in structure or function. There are limits to the amounts of change that can be introduced into mechanical and biological systems. A cotton gin can't be turned into a desktop computer; nor can a worm be turned into a giraffe. But an agricultural society can become an industrial society; a socialist economy a capitalist one. An effective social systems model must be able to handle such discontinuous change and genesis that go well beyond what the mechanical and biological analogies can describe.

Walter Buckley (1921-)

Burrell and Morgan attribute to Buckley a view based on a centrality of the morphogenic viewpoint. (p. 66) Buckley describes social structure as emerging from the process of social interaction; placing him a bit more to the subjectivist side of Burrell and Morgan's functionalist paradigm quadrant than others discussed above. Buckley's view is consistent with Radcliffe-Brown's, but allows for analogies that extent beyond the organismic. In particular, Buckley's position closely aligns with the field of cybernetics, and supports a shift toward more interactionist approaches that follow.

The key element of the theories that Burrell and Morgan include in their discussion of systems theory-based models is their focus on internal organization and the relationship between the system and its environment. When the mechanical and biological analogies are used, this places systems models toward Burrell and Morgan's objectivist end of their model; the system existing independent of the individuals who make them up. As the system analogy extends beyond such models, the models

become increasingly subjective, with individual interactions playing a greater part; and change-oriented, with change and genesis becoming increasing concerns. For this reason, Buckley appears again in Burrell and Morgan's list of integrative thinkers below.

Interactionism

Still within Burrell and Morgan's functionalist paradigm, interactionist social theories move away from the objectivism of the structural functionalist concepts toward a more subjective set of concepts that focus on the behaviors and interactions of individuals and social groups. What keeps these theories within the functionalist quadrant is the fact that they remain focused on interactions, not meanings ascribed to those interactions. More subjective because of the involvement of actors; these theories will not cross to Burrell and Morgans interpretive quadrant because they maintain enough objectivism to preclude discussion of the intent of those actors nor the meanings they place upon their interactions.

Georg Simmel (1858-1918)

Burrell and Morgan describe the analysis of individuals associations and interactions as originating with Georg Simmel. (p. 71-72) Simmel (1955b) looked at such entities as the state, clan, and family as superindividuals; each subject to analysis as the crystallization of the interactions of their component individuals. His focus was on the analysis of individuals within each of these social contexts, drawing a distinction between simple associations among actors in convenient proximity and true affiliations, where beliefs and desires might be shared across freely chosen relationships. (p. 130)

Simmel (1955a) established a behavioral grammar for discussing social life based on dyadic and triadic relations. Conflict and alienation between each individual and their social world played a part in defining the reciprocal context for these interactions. He described conflict as the major cause and modifier of interest groups, unions, and organizations. "There probably exists no social unit in which

convergent and divergent currents among its members are not inseparably woven." (p. 15) He saw unity emerging from such conflict at two levels; first, as consensus and agreement among individuals who worked to overcome disagreements, and second, as to totality of agreement or "group-synthesis" (p. 17) that resulted as the social group emerged from the simple interactions of its members.

He observed that characteristics that could be viewed as negative or damaging among individuals would not necessarily have such an effect from the standpoint of the total unity. (p. 44) Disagreements or conflict among strangers pose the least risk to the social unity precisely because each individual in the dyad or triad invest very little in the overall relationship within which any disagreements exist. Among intimates though, small conflicts can be extremely disruptive precisely because the individuals are so totally invested in the relationships.

Coser (1965) described Simmel's position as an objectification of these relationships, balancing the total involvement of unity and the total distancing of strangers. Through conflict the individual maintains autonomy, with conflict acting as a regulating mechanism that draws one in to new relationships while preventing many relationships from becoming too intimate.

The impact of Simmel's conflict model is that, while small conflicts among intimates can disrupt and conflict among strangers will stabilize, group affiliations tend to balance out as individuals define their multiple-relationship position in society. Distant relationships grow more intimate, and intimate relationships grow slightly more distant through conflict and reconciliation. Simmel argues that the balancing of such multiple group-affiliations can strengthen and reinforce the integration of each individual's personality. (1955b, p. 141-2) The conflicting and integrating tendencies of these interactions will be self-reinforcing as long as the different affiliation groups are not too far apart

conceptually. The individual's behaviors will align with a diversity of group interests in different positions on the stranger-intimate continuum. (p. 146).

George Herbert Mead (1863-1931)

George Herbert Mead extended the behaviorism of Simmel to take a position that the mind or consciousness of the individual plays a significant role in the behavior of individuals within social systems. Specifically, the way actors interpret or define the interactions in which they participate partly determines their interactive responses. By the same token, the mind of the actor, the self, also arises in the context of those social interactions. Thus the interaction of individual and social context determines both the framework in which interpretations are made, and the actions that create the social context that are influenced by those interpretations.

Burrell and Morgan leave Mead in their functionalist quadrant because, while advocating the study of behavior from a position that emphasizes the role of human interpretations, Mead remained a behaviorist. (p. 74) He didn't work to ascribe particular interpretations to individuals; only asserting that any hidden beliefs or interpretations affected behavior. He placed emphasis on the role of gestures as providing the signals in need of interpretation in the social context. Gestures were not limited to language, although language plays a key role in allowing for communication and interpretation in the social context.

Symbolic Interactionism

Mead's ideas lead directly to the school of thought labeled symbolic interactionism; that the symbolism attached to gestures and actions by actors in the social context influence subsequent actions by those actors. Symbolic interaction goes beyond the prompt-to-response mechanisms studied in basic behaviorism to posit an intervening set of interpretative variables that account for the diversity of

actions and reactions apparent in social exchange. If the mediating interpretations are as important as suggested, then social affairs will best be understood through detailed analysis of the actions and responses of individuals looking for the meanings attributed to each action. The depth component of this knowledge area module explores symbolic interactionism in greater detail.

Social Action Theory

Remaining within the functionalist quadrant of their framework, Burrell and Morgan describe the role of social action theories as building on the foundations of basic interactionism. They place these theories, primarily those of Weber and Parsons, among the most subjective of this otherwise objective functionalist paradigm. The reason that they leave these theories in the functionalist quadrant, as opposed to shifting them toward the more subjective interpretive paradigm quadrant, is that these theories limit themselves to conclusions that can be drawn from the action of actors. While meaning and intent is presumed to exist within the actors; no steps are taken to understand or infer such meaning and intent. Only the actions matter. To the extent that such meaning becomes a direct area of study, these writers will appear again in Burrell and Morgan's quadrant representing their interpretive paradigm.

Max Weber (1864-1920)

Weber's method of *verstehen*, or the placing of oneself in the position of the actor being studied, gave a role to the subjective meaning of events and actions that was contrast to the viewpoints traditionally associated with the natural sciences. Burrell and Morgan describe Weber's views as methodological, lamenting the tendency they see in other writers to over-generalize Weber's methods into a general interactionist viewpoint. (p. 83) They describe the four action typologies defined by Weber, including: 1) traditional actions or habits, 2) emotionally dominated actions, 3) rational actions targeting some absolute value, and 4) rational actions toward some specific ends in which alternatives

might need to be evaluated. As sociological tools, these four types could be used to analyze and organize observations of behaviors and actions without needing to understand the specific habits, beliefs, emotions, and rational choices driving such actions; leaving such practice just barely in Burrell and Morgan's functionalist paradigm.

Talcott Parsons (1902-1979)

Burrell and Morgan associated Parsons' early writings with their positioning of social action theory within their paradigm. (p. 85) They describe the notion of volunteerism described by Parsons as based on Weber's notions that the habits, beliefs, and choices made by actors strongly influence their actions, even if such underlying motivations remain hidden and unknown. Parsons' later writings shifted his placement in Burrell and Morgan's framework toward the more objective end as his views became increasingly deterministic and causative. Burrell and Morgan describe his later writings as placing him in the realm of systems thinkers described above. (p. 85)

Integrative Theory

Burrell and Morgan describe integrative theory as the "middle ground" (p. 87) in their functionalist paradigm; more objective than the various interaction and social action theories, yet more subjective than the more formal structural and systems theories described earlier. They describe four variations on theories that attempt to integrate systems theory with interactionism, the common themes being the presumption that achieving social order requires an explanatory model that goes beyond the structural and systems perspectives to integrate the role of the actor; whether through goals, needs, or intent.

Peter M. Blau (1918-)

The first variation of integration theory described by Burrell and Morgan is Blau's exchange and power model in which exchange power is viewed as central to social life. Blau bridges interactionism and systems theories from the interactionist side; seeing social system structure as emerging from the interactions of exchange and delineation of power relationships among individuals. The legitimacy of power often rests on the collective approval of those subordinated to that power; making power a form of exchange. Throughout these exchanges, relationships within the society are constantly undergoing dynamic change as shifts in power result in different underlying structures against which subsequent exchanges are seen to take place. Shifts in power result in new subsequent patterns of exchange that stabilize the new social relationships and structure. Interaction therefore leads to new systems structure, which drive new interactions; integrating these opposing areas of Burrell and Morgan's functionalist quadrant.

Robert Merton (1910-)

Burrell and Morgan describe a second variation of integrative social theory through Merton's work on the definition of middle range theories that take both micro and macro-level views of social and cultural structure. (p. 90) Merton (1968) articulates three then-prevailing postulates in functional analysis, and then rejects each:

1. "Postulate of functional unity of society." (p. 79-84) The postulate that society is a single functional whole that is integrated and balanced. Merton argued that such unity might apply to the primitive societies studied by Malinowski and Radcliffe-Brown, but that such thinking would extend poorly to more differentiated literate societies.

2. "Postulate of universal functionalism." (p. 84-86) The postulate that all social practices and actions must be functional. Merton argued that such thinking ignores the ability of actions and behaviors to survive and persevere long after their functional purposes expires or becomes obsolete. There are many such practices in many society that served a functional purpose in the past but no longer do so.

3. "Postulate of indispensability." (p. 86-90) The postulate that there are some form of universal functional prerequisites that every society must serve or provide if they are to endure. Merton argued that such a position ignored the obvious ability of multiple functions to serve similar purposes and that many functionally necessary actions might have multiple alternatives or equivalent functions available.

Merton felt that such position shouldn't and couldn't be postulated in advance. They each needed to be shown empirically; and argued that actual empirical research was already showing them to be incorrect. This didn't mean that Merton abandoned the functionalist position, just that his middle-range theories worked against such generalizing concepts across whole societies. Rather, subgroup societies would be the basis for analysis; with functions in one subgroup often appearing as dysfunctions in others.

By looking at functional behavior in conformist and nonconformist terms, Merton expanded the role of social structure beyond that of setting norms for values and behavior to include allowing for both conformity and nonconformity. (p. 188-91) Such norms would be relative to the subgroup that set the context of analysis. Interactionism described norms as emerging through the continuous interaction and reaction of individuals within the society. Merton described an integrated position in which such norms, or lack thereof, are integral to the social structure in which such interactions take place. The social structure provides a set of normative, or comparative, types against which individuals understand and

define themselves as they interact. Under these conditions, social and cultural interactions allow for continuing emergence of new social structures; with the current structures providing constraints and regulation for the direction and pace of change.

A recognition that dynamic change needs to be more explicit handled by functionalist theories leads to Burrell and Morgan's third variation on integration theory: conflict functionalism. Where the second variation integrated interactionism and systems theories along the subjective-objective dimension of Burrell and Morgan's framework, conflict functionalism looks at this integration from the standpoint of change and so works toward integration along the vertical, or change-regulation, dimension of their framework.

Walter Buckley (1921-)

The fourth variation of integration theory described by Burrell and Morgan is Buckley's morphogenic systems theory, first described above as part of Burrell and Morgan's systems thinking models. They describe Buckley as looking at weaknesses in the application of the mechanistic and organic analogies, looking at and emphasizing collective behaviors that are less structured than those analogies would discuss, and seeing a role for deviance and control for institutionalizing directions of change. Buckley (1967) sees deviance and control as provided a needed source of "a potential pool of adaptive variability" (p. 63) needed to combine with the elements of environmental interplay and adaptive selection in order for the evolutionary paradigm to be applied to social structures.

Buckley draws on communication and information theories to bring together aspects of interactionism and systems theory. These areas define an ability of a complex system, of which Buckley sees society as a special case, to self-organize, self-regulate, and self-direct. He describes the emergence of social characteristics through the interaction and feedback of these processes as key

elements of morphogenic societal development. Burrell and Morgan describe Buckley's work as representing "an extremely sophisticated attempt to develop an integrative systems model characteristic of the middle ground of the (functionalist) paradigm." (p. 99)

Objectivism

Burrell and Morgan describe objectivism as the extreme objective end of their functionalist paradigm. Where in other areas of functionalism the mechanistic and organismic models in the natural sciences were used to provide analogies and generate hypotheses, objectivism takes the more extreme position that social systems and interactions are, in fact, real natural objects that can and should be studied using the technologies and concepts of the natural sciences. (p. 102) Human beings can be viewed as machines, and social structure can be viewed in the same way as physical structures would be viewed in the natural sciences.

B. F. Skinner (1904-1990)

Burrell and Morgan illustrate the role of objectivism in their functionalist paradigm using Skinner's behaviorism. Skinner viewed man as machine; with behaviors directly attributable to stimuli available in the environment. Contrary to the interactionist writers at the other extreme of Burrell and Morgan's functionalist quadrant, behaviorism views any subjective states of mind of the actor as irrelevant to scientific inquiry.

Skinner (1938) described the history of thinking about behavior. (p. 3-6) Earliest thinking saw the origins of behavioral characteristics as located in entities outside of humanity. Belief in gods and supernatural forces would dominate such thinking; and be forever outside of any legitimate scientific study. Later, behavior came to be associated or attributed to entities within each organism such as psychic or metal states. This change in thinking began to make such attributes amenable to scientific

investigation. However, Skinner argued that this change only shifted the unanswerable questions into the organism one level. One was left unable to study the psychic or mental states just as previous thinkers had been unable to study the mind of God. Investigation would be limited to a representation of free will; or else would have to attribute characteristics to some inner states. Skinner offered Freud's ego, superego, and id as examples of such thinking. These definitions, Skinner argued, only accented the behavior of such states; failing to adequately explain them.

Next came a shift from the study of mental states to the study of the physical nervous systems that was supposed to drive and define those states. Skinner applauded the fact that study was at least redirected toward a tangible object that could be observed. However, he felt that an overt focus on the mechanisms often discouraged a direct study of the actual behaviors of interest. His argument against the study of the nervous system as a proxy for studying behaviors was the feeling that such a shift was trying to "explain the simple with the incomprehensible." (p 6)

To Skinner, it seems obvious that one needed to actually study behaviors directly if one wanted to understand them. "The need for a science of behavior should be clear to anyone who looks about him at the role of behavior in human affairs." (p. 5) Behaviorism would focus on how individual organisms actually interacted with their environment; with what they do. Inner states would be deemed not relevant or necessary in explaining the path from stimuli to action. Once such an approach is taken as normative, the preponderance of quantitative and controlled experimental methods is almost automatic. The social scientists varies stimuli provided to test subjects, and observes changes in behavior; thus generalizing laws of social relationships and interactions.

Straddon (1993) describes Skinner's position as "slipping seamlessly" (p. 63) between science and radical behaviorism; the former being the facts and methods of the study of operant conditioning

and behavior, and the latter his underlying philosophy of science. To accept Skinner is to accept his philosophy of science more than his science. This slipping between science and philosophy is a central distinction developed by Mills.

C. Wright Mills (1916-1962)

Another example of work in Burrell and Morgan's objectivist corner of their functionalist paradigm is Mills' discussion of abstracted empiricism. Mills (1959) focused on social theory development, and treated writers who allowed the methods of the natural sciences to dominate their methods as practicing abstracted empiricism. Mills described abstracted empiricism in terms of "methodological inhibition" (p. 50) and "substantive thinness;" (p. 56) arguing that the rise of automation (and in 1959 Mills was speaking of technology such as punched cards and Hollerith machines, not the computers still in the future) provided an ease of sampling, interviewing, classification, and analysis that appealed to those attempting to apply the scientific method to social studies.

Mills describes two basic philosophies of social science common among his abstract empiricists. The first involves examining what goes on in the real world, generalizing from those observations, and then further examining and studying the implications of those generalizations. (p 57) The second involves efforts to adapt and restate principles of natural science in social terms. He laments that the first is rarely practiced, and the second is practiced too much. (p. 58) Although much has changed in practice since his writings, his three level model for evaluating where single researchers fall against these two models is illuminating. First level researchers speak in terms of the methods they apply to studying the world. Second level researchers study those methods and describe generalized methodologies. The third level define epistemologies based on their study of those second level methodologies. Too many

social scientists, in Mills' view in 1959, were actually abstract empirical philosophers working at that third level. (p. 57-8)

Burrell and Morgan, in describing Mills, include systems theorists who measure structure over interaction, integrative theorists who attempt to quantify qualities such as power or deviance, or others who attempt static measurements of otherwise dynamic interactions. To Mills, "the intellectual characteristics of abstracted empiricism that are most important to grasp are the philosophy of science held by its practitioners, how they hold it, and how they use it." (p. 56) He regards social theorists working at too high a philosophic level to be merely claiming to be natural scientists.

Burrell and Morgan describe the common thread of these integration theories as social theorists who fall squarely in the functionalist quadrant but who engage in research that nearly violates the assumptions of that quadrant. (p. 105)

This chapter has outline the various theories that Burrell and Morgan identify in their functionalist quadrant. While these theories exhibit diversity, their coherence binds them together relative to the social theories in Burrell and Morgan's other three quadrants discussed in the introductory chapter. The next chapter introduces the postmodern perspective that will be carried forward in the depth component to further explore the structural-functionalist model presented in this chapter.

Chapter 3

Modernism to Postmodernism

Implications of Burrell and Morgan

Burrell and Morgan lament the fact that the theories they place in their own functionalist paradigm tend to completely dominate sociological thought. They suggest that any of the four paradigms can be used to suggest arguments that will virtually demolish the arguments made in the other three rival paradigms. (p. 395) They developed their framework using the differences in underlying assumptions between and among differing social theories. Based on these differences, each would successfully argue against any position taken by the others. They suggest that the dominance of the functionalist tradition prevents the rival paradigms from developing to contextual maturity. They are simply overwhelmed by arguments and positions taken within the dominant paradigm. At best, they are evaluated and critiqued from the position of functionalism as normative.

They offer an alternative approach to viewing and using their four-paradigm framework. (p. 396) They argue for allowing each paradigmatic tradition to be allowed to developed independently for a period of time; that social theorists allow themselves to "step outside" (p. 396) of the functionalist paradigm and allow inherently distinct traditions to develop. They view the three rival paradigms as "embryonic" (p. 397) and in need of being allowed to develop into coherent self-sustaining "full-fledged" (p. 397) traditions. The assumptions and positions that define each view can be used to anticipate lines of development to explore issues raised by those defining perspectives. Burrell and Morgan argue that these lines of inquiry can only be most effectively pursued if each paradigm is allowed to develop in its own right; rather than along lines of always being seen as a critique or challenge to functionalism.

Writing in the late 1970's, Burrell and Morgan were proposing a research agenda that was highly modernist. While maintaining that there was much diversity among the social theorists that they categorized into their four quadrant framework, they nevertheless concluded that each strain of thought could be explored and eventually worked out in all its detail if left alone and isolated long enough to be completely defined independent of the dominant functionalist paradigm. This view that a specific logic could be determined for each subdiscipline was highly modernist in orientation; founded in a belief that firm rules and laws could be established if isolated and studied in the right ways.

This chapter introduces the more synergistic alternative that has actually emerged in the field in the intervening two decades, the details of which will be explored in the depth component. The postmodern view of accepting that many differences in social theory are inherent to the endeavors being studied stands in contrast, but not contradiction, to the modernist view that systems of coherent laws can be established that will reconcile apparent differences. Ritzer (1997) describes the postmodern as "encompass(ing) a new historical epoch, new cultural products, and a new type of theorizing about the social world." (p. 6) He characterizes the shift from modern to postmodern as a shift in perspective, not subject; method, not goal.

Where modern social thinking attempts to systematically generalize a coherent picture – as proposed by Burrell and Morgan – postmodern social thinking is usually highly unsystematic. (p. 23) However, a parallel exists between the two discussions because of the dominance of functionalism in both. Burrell and Morgan lamented the dominance of functionalist thinking and the limiting effects such dominance introduced into discussions of their three other conceptual paradigms. If the normative nature of functionalism were removed, they argued, each of the other major paradigms could develop and mature toward an eventual synergy of equals. The postmodern writings highlighted below, and

explored further in the depth component, find themselves equally limited by the normative nature of modern functionalism. Postmodern writings invariably define themselves in terms of how they differ from modernist writings. As a result, it has taken decades to sort out postmodern thinking and have it establish itself as a stand-alone discipline. Each argument in postmodernism, even today, must position itself against the normative framework of modern functionalism.

Rise of the Postmodern

Ritzer (1997) describes modern and postmodern as being not mutually exclusive. They are alternative ways of looking at the social world. The modern viewpoint tends to look for finality and coherence, an underlying order and lawfulness in the somewhat chaotic and disorderly world of the postmodern. "One of the premises of postmodern is that distortion occurs when efforts are made to make the incoherent seem coherent." (p. 2) The postmodern avoids such distortions through interdisciplinary and intertextual approaches that maintain the dynamics and inner contradictions of the subjects discussed.

Modern vs. Postmodern

Modern social theory looks for the absolute, the rational, and expects to discover the truth. Postmodern social theory is more relativistic and open to opportunities for irrationality and multiple truths. Reality can only be known narrowly because broader or grander theorizing only distorts that which is being explained. Postmodern will remain incomplete and incoherent rather than cross to distortion and boas. Ritzer calls for efforts to "modernize postmodernism." (p. xvii) "An incoherent overview of an incoherent field is in nobody's interests." (p. 4) Maintain and use some of the rigor and methods of modernism while maintaining awareness and control over the distortions predicted by postmodernist thinking.

Types of Postmodernism

Smart (1993) describes three positions from which different thinkers tend to approach postmodernism. (p. 23) The extreme postmodernist looks at modern society as having been replaced by postmodern society. Social thinking requires a rebuilding of theory from the ground up, taking into account the relativism of postmodern direction, and avoiding the pitfalls encountered and enduring in modern social theory that is being replaced. The extreme position sees a "break or rupture with modern conditions." (p. 23). Lemert (1997) describes this form of thinking as radical postmodernism. (p. 36)

A more moderate second position entails postmodernity growing out of and beyond modernity. Postmodern thinking is continuous with the modern, and tends to emerge as additional and specialized disciplines that go beyond the conceptual limitations of modernist writing. Examples of such positions include postmodern feminists, or postmodern Marxists. Each challenges and extends modern social theory without trying to completely discard it, although some theorists in this position are more or less radical than others. Lemert sees this form as recognizing that something has changed, but that the modern still has purpose. (p. 36).

The third position, actually held by Smart and illustrated by Ritzer above, sees the modern and postmodern engaged in a continuous relationship with each other; with postmodernism continually pointing out the limitations and discretions of modernism. They represent alternative perspectives on he same subjects and specialties. Lemert, calling it strategic postmodernism, sees in this position a readiness of modernists to be transformed by postmodernism. (p. 36) Smart describes it "as a way of relating to modern forms of life, … a facing up to modernity, its benefits and its problematic consequences." (p. 23)

The depth and application components of this KAM take this third moderating position. They take advantage of the structure of the modernist viewpoint and the multiple perspectives of the postmodernist viewpoint to shed light on functional and interaction-based social theories as they can be applied to social and process change in industry.

References

Baert, P. (1998). *Social theory in the twentieth century*. Washington Square, NY: NYU Press.

Buckley, W. (1967). *Sociology and modern systems theory*. Englewood Cliffs, NJ: Prentice-Hall.

Burrell, G.; & Morgan, G. (1979). *Sociological paradigms and organisational analysis: Elements of the sociology of corporate life.* London: Heinemann.

Cohen, P. S. (1968). *Modern social theory*. New York: Basic Books.

Comte, A. (1875). *System of positive polity.* New York: Burt Franklin.

Coser, L. A. (1965). *Men of ideas: A sociologist's view*. New York: Free Press.

Lemert, C. (1997). *Postmodernism is not what you think*. Malden, MA: Blackwell.

Malinowski, B. (1944). *A scientific theory of culture*. London: Oxford University Press.

Merton, R. K. (1968). *Social theory and social structure*. 1968 Enlarged Edition. New York: Free Press.

Mills, C. W. (1959). *The sociological imagination*. New York: Oxford University Press.

Pareto, V. (1935). *The mind and society.* Arthur Livingston (Ed.) Andrew Bongiorno (Ed. Trans.) New York: Harcourt, Brace, and Co.

Park, R. E.; & Burgers, E. W. (1972). *Introduction to the science of sociology*. Third edition. Chicago: University of Chicago Press.

Parsons. T. (1971). *The system of modern societies*. Englewood Cliffs, NJ: Prentice-Hall.

Peel, J. D. Y. (1971). *Herbert Spencer: The evolution of a sociologist*. New York: Basic Books.

Powers, C. H. (1986). *Vilfredo Pareto.* Newbury Park, CA: SAGE Publications.

Radcliffe-Brown, A. R. (1952). *Structure and function in primitive society.* New York: Free Press.

Ritzer, G. (1997). *Postmodern social theory*. New York: McGraw-Hill.

Simmel, G. (1955a). *Conflict*. Kurt H. Wolff (trans.) New York: Free Press.

Simmel, G. (1955b). *The web of group-affiliation*. Reinhard Bendix (trans.) New York: Free Press.

Skinner, B. F. (1938). *The behavior of organisms: An experimental analysis*. New York: Appleton-Century-Crafts.

Smart, B. (1993). *Postmodernity.* London: Routledge.

Straddon, J. (1993). *Behaviorism: Mind, mechanism and society.* London: Duckworth.

Turner, J. H. (1985). *Herbert Spencer: A renewed appreciation*. Beverly Hills, CA: SAGE Publications.

Bibliography

Ahrne, G. (1994). *Social organizations: Interaction inside, outside, and between organizations*. London: Sage Publications.

Bertalanffy, L. v. (1968). *Organismic psychology and systems theory*. Barre, MA: Clark University Press.

Bertalanffy, L. v. (1971). *A systems view of man*. Boulder, CO: Westview Press.

Blumer, H. (1990). *Industrialization as an agent of social change: A critical analysis*. New York: de Gruyter.

Bogardus, E. S. (1960). *The development of social thought*. New York: David McKay.

Boudon, R. (1986). *Theories of social change: A critical appraisal*. Berkeley, CA: University of California Press.

Gordon, T. J. (1992). Chaos in social systems. *Technological Forecasting and Social Change, 45*. 1-15.

Hesselbein, F.; Goldsmith, M. & Beckhard, R. (Eds.) (1997). *The organization of the future*. The Drucker Foundation Future Series. San Francisco: Jossey-Bass.

Hesselbein, F.; Goldsmith, M.; Beckhard, R.; & Schubert, R. F. (Eds.) (1998). *The community of the future*. The Drucker Foundation Future Series. San Francisco: Jossey-Bass.

Lemert, C. (Ed.) (1999). *Social theory: The multicultural and classic readings*. Boulder, CO: Westview Press.

Monane, J. H. (1967). *A sociology of human systems.* New York: Appleton Century Crofts.

Parsons, T. (1960). *Structure and process in modern societies*. New York: Free Press.

Parsons, T.; Shils, E.; Naegele, K. D.; & Pitts, J. R. (Eds.) (1961). *Theories of society: Foundations of modern sociological theory*. New York: Free Press.

Ritzer, G. (1991). *Contemporary sociological theory*. Third edition. New York: McGraw-Hill.

Sutherland, J. W. (1973). *A general systems philosophy for the social and behavioral sciences*. New York: George Braziller.

Swedberg, R. (1998). *Max Weber and the idea of economic sociology*. Princeton, NJ: Princeton University Press.

Turner, J. H. (1991). *The structure of sociological theory*. Fifth edition. Belmont, CA: Wadsworth Publishing.

Turner, B. S. (Ed.) (2000). *The Blackwell companion to social theory*. Second edition. Malden, MA: Blackwell Publishers.

WALDEN UNIVERSITY

Core Knowledge Area Module 1:

Principles of Societal Development

AMDS 8122 - Cross-cultural Aspects of Organizational Change

Student: Richard E. Biehl
Program: Applied Management & Decision Sciences
Specialization: Leadership and Organizational Change
Assessor: Dr. Gary Gemmill

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Annotated Bibliography

The journal articles annotated in this bibliography were selected in order to provide detail coverage of two areas: 1) applications and critiques of postmodernism as it is described in the current literature, and 2) process improvement in the software industry using models that invoke both functional and interactionist aspects. These two threads in the literature are more or less independent of each other, but it is the focus of this depth component generally, and the application component specifically, to bring these two threads together to seek applications where the postmodernist thread can inform the process improvement thread.

Allan, K.; & Turner, J. H. (2000). A formalization of postmodern theory. *Sociological Perspectives, 43*(3). 363-385.

Using a scientific epistemology that would seem objectionable to many of the postmodernists that they cite and describe, Allan and Turner offer a highly modernist perspective on postmodernism that works to identify its central propositions in such a way that testable hypotheses can be developed and proposed for further study. They describe themselves as making an "effort to make postmodern theory more readily accessible to sociologists." (p. 379) Their belief is that modern theory is extended by postmodernism, but that "the lineage to classical theory is evident – if one looks." (p. 380) Their formalization method consists of identifying propositions based on postmodernist writings. Four central propositions are explored, each taken to extensive detail in well described tables throughout their paper.

The authors' first proposition deals with an increasing importance of culture in society. Describing postmodernism as partly a critique of capitalism and the innovations that keep it growing, the

role of commodification plays a key role in impacting cultural icons and their spread. "The dynamics of commodification eventually push production past both use and exchange value to products that are essentially symbolic." (p. 367) Goods and services come to be purchased and consumed for their status significance rather than simply their utility. The economic becomes cultural. As capitalists seek to market commodities embodying cultural significance, the cultural impact of that significance is diluted while serving the capitalist purpose. In a system of ever expanding production, it is just a matter of time until the commodity-driven economy moves on to the next cultural icons for exploitation. "Thus capitalism eventually begins not only to colonize but also to destroy the lifeworlds of cultural groups." (p. 368) Hence, the expansive importance of culture in social analysis is the first of Allan and Turner's propositions derived from the postmodernist position.

The second proposition, building on the first, deals with the destabilization and dereificication of culture. The commodification of cultural symbols and meanings causes a break between those symbols and the realities that they once represented. "As a result, culture is unstable and loses its capacity to make the world seem read and obdurate." (p. 371) What was once cultural and stabilizing is now commodified and economic; traveling the globe in economic exchange. "Culture becomes trivialized as it loses its stature as a firm reality and becomes yet one more object to be marketed." (p. 373)

Allan and Turner's third proposition focuses on the increased importance of the individual in social analysis. They point out that the increased focus on subjectivity and the individual has resulted in an increase in self-reflection as a prominent epistemology and by-product of postmodern thinking. As individuals participate in the many complex social interactions and webs associated with the postmodern condition, they find themselves increasing marginalized from any one of their affiliations. Their self-reflexive image becomes based on themselves as a stand-alone entity rather than as an integral

component of some larger whole. The short-term nature of many of the relationships they participate in prevents many of those relationships from serving as definitional elements of their self-image. The individual ends up being very free; but lacks immersion in affiliation groups. Coupled with the loss or weakening of commodified cultural icons, the individual has less and less to lean on in self-reflection – leading to the final of the authors' four propositions.

The loss of viability of the individual subject serves as Allan and Turner's fourth proposition. By loss of viability, they contend that the ability of social theorists to study the individual as subject is at least partly dependent upon the individual being anchored in cultural systems and defining group structures that are stable. The loss of these defining structures in postmodernism makes the remaining individual difficult to understand other than through reflexivity of each subject. "Self-reflection does not lead to a stable self but rather one that is perpetually subject to change, thereby denying individuals the sense of well-being that comes from a stable identify." (p. 378)

This fourth proposition has implications for this knowledge area module. The authors argue that this breakdown of the individual as subject is what makes social theorizing most difficult under postmodernists perspectives. A contributor to this difficulty is the ever-growing and expanding diversity of interactions and relationships that make up the individual self-knowledge web. As relationships, particularly professional or employment relationships, become less defining of the self, the relationship between individuals and employers becomes harder to codify. Allan and Turner point to a rise in credentialing throughout our society as a partial attempt to re-codify relationships that have become more ephemeral.

The layering of such credentials, such that individuals need many such credentials in order to define their self-position in the professional web, helps limit the sensory overload that the authors

attribute to the complex reflexivity required by individuals to maintain their place in their lifeworld. "Postmodern society presents such constant change and such high levels of diversity and divergence in sociocultural arrangements that it becomes difficult for the individual to find a stable core in social structures and cultural symbols in which to invest his or her emotions." (p. 379) The five-layered credentialing models described later in this depth component seem to try to serve this mediating purpose between professionals and employers or industry. The plateaus between the five layers might offer stabilizing points at which individual reflexivity can anchor self-images; at least within the professional-employment relationships that help define the individual.

Antonio, R. J. (2000). After postmodernism: Reactionary tribalism. *American Journal of Sociology, 106*(2): July:40-87.

Antonio looks at tribalism as an alternative to some of the sweeping all-encompassing world images portrayed by modernist sociologists as too broad for empirical testing, and by postmodernists as retrograde grand narratives that should be rejected in principle. He explores three themes that he argues provide the rationale for viewing subcomponents of the major societal groups as reactionary units – tribes – that can be modeled and treated as the primary units of societal discourse: a) autreferentialism, the view that each culture operates under its own contained logic, b) antiuniversalism, representing a denial that cross-group consensus is really possible, and c) cultural politics, where the modernist view of collective political action gives way to a postmodernist discourse and local-orientation.

Reactionary tribalism is Antonio's designation for the "resurgence of group identifies" (p. 55) on less than grand-narrative scales. "Man forms tribes because he knows what he is by contrast to what

he is not, and because a single worldwide society is too vast for feelings of participation and loyalty." (p. 55) These tribes serve to support and encourage meaning at the local level, while avoiding the homogenization of culture that dominates capitalist modernist thinking. Diversity within and across the tribal structure can bring forth stronger structures and continued improvement, while such diversity across the mass society is viewed as a destabilizer that needs to be universalized.

Self identification of individuals with professions, as discussed later in this depth component, can be viewed as a tribalization of the workplace. The diversity emergent within and across the profession isn't large enough to become destabilizing, and the grand narrative of employment can be interpreted locally by individuals within the profession. The result can be Antonio's "diverse, decentered, and culturally tolerant" (p. 48) work culture, enriching the lives and careers of the professionals within the tribal structures.

Castells, M. (2000). Materials for an exploratory theory of the network society. *British Journal of Sociology, 51*(1). January/March: 5-24.

There is a logic to the creation and operation of networks that can be applied to an analysis of social morphology. Castells uses such a logic to analyze and discuss changes in global capitalist social systems during the late twentieth century. Of particular interest to this depth component are the details of his descriptions of the role of network concepts in explaining the evolution and change of social structures. His discussion applies these concepts to the larger macro-economic society; but his descriptions can be used to understand aspects of smaller scale social structure changes that take place within industries or organization; such as those discussed below for implementing socio-technical change in software engineering organizations and the software engineering profession.

Castells, leaning toward the aspects described in this depth component as interactionist, defines social structure as being formed by the interplay of relationships. "Meaning results from symbolic interaction between brains which are socially and ecologically constrained, and, at the same time, biologically and culturally able of innovation." (p. 7) Castells asserts that these interactions "crystallize over history in specific territories" (p. 8) thus creating individual cultures that are unique to their time and space. Individuals choose to join in these cultures, and so form their identifies through their interactions with the production and consumption patterns and experiences of each culture.

The rise of the network paradigm for looking at social structure is largely an offshoot of recent developments of electronic and information networking capabilities; largely a technology-driven discussion. Castells, though, describes networks as among the earliest forms of social organization. He recognizes weaknesses in the earliest non-traditional network model, namely that other forms of social organization such as command-and-control hierarchies with their rationalized chains of command and bureaucratic functioning could vastly outperform network groups in all but the simplest tasks or goals. Networks are among the most flexible of structures, and can typically evolve with their environment better than fixed rigid structures; but they exhibit difficulty in coordinating functions and focusing activities on specific goals.

The rise of information networking technologies has reversed this network-hierarchy disadvantage, enabling network social structures to utilize better coordination capabilities inherent in the technological network, while exploiting the always present evolutionary optimization available in the oldest social networks. Social network structures are re-enabled, not defined, by information networking technologies. Shifts in recent years in production and employment patterns in capitalist societies can be attributed to this reestablishment of the network as the newly advantaged social

structure. "Once introduced, and powered by information technology, information networks, through competition, gradually eliminate other organizational forms, rooted in a different social logic." (p. 16)

The network social structure model applies to the software processes described below using the process maturity model as a tool for organizational improvement. Improvement is sought through a staged evolution of what amount to autonomous but interrelated nodes in a professional network. Castells discusses the difficulties in changing the goal structure and behavior of a network. Without a formal center, the social network can be extremely difficult to change. Change is largely to be expected to occur, according to Castells, from outside the network. Adding new specialized nodes and training existing nodes to interact more with these new nodes that previously existing nodes is roughly how networks are taught to perform in new ways. This thinking has direct impact on understanding why the various change models analyzed in this depth component may function and perform the way they do in the real world.

Chan, A. (2000). Redirecting critique in postmodern organization studies: The perspective of Foucault. *Organization Studies, 21*(6). 1059-1075.

Chan uses Foucault's concepts regarding freedom and resistance to develop a differentiating model for postmodern change based on self-reflection and creative representation. Chan describes Foucault's position as describing actions within organizations as resistance, each individual resisting those conditions within each organization that limit personal freedom. The result is that organizations exert considerable control over their members. The question, for Chan using Foucault, is whether such control will be through dominion or power.

Dominion is a mode of acting on individuals that runs counter to their own needs and favors the organization. Such action subjugates or subordinates the individual to the will of the organization. Power acts more indirectly on individuals through internal means. It attempts, through subjectivation, to get individuals to respond to a set of goals and objectives that aren't necessarily those which would be adopted outside of the organization context. Dominion is change enforced. Power is change inspired. "Organizational discourses, from corporate culture in the 1980s, through managerial competencies and learning organizations in the1990s to the current discourses of knowledge work and the virtual workplace rewire organizational agents and invest within them their new selves and subject-specific competencies." (p. 1065)

Through Foucault's subjectivation, managers and employees come to share common goals and cultural aspirations; each based upon their own internal motivators. Individuals become free to conduct their affairs their own ways; having adopted many of the organization's goals. In the process, the efforts of individuals feedback upon the organization's goals resulting in a changed organization as well. This goal-feedback has implications for the process change model descrcibed below in this depth component. Foucault's idea of resistance and then freedom can be used as a model for understanding how such models can be introduced through individual involvement and buy-in (e.g., power) rather than simply by management mandate from above (e.g., dominion). Foucault believed, reports Chan, that self-consciousness on the part of individuals is an essential catalyst of successful change. If true, then the software process models described below need to be implemented, not by mandate, but by making individuals involved more self-conscious of their own working environments and their own problems that the improvement models are designed to address. Resistance to the status quo becomes a freedom driver to adopting change.

Charmaz, K. (2000). Looking backward, moving forward: Expanding sociological horizons in the twenty-first century. *Sociological Perspectives, 43*(4). 529-547.

As her 2000 Presidential Address to the Pacific Sociological Association, Charmaz describes some of the lessons learned in sociological practice during the twentieth century, with the emergent schisms between modern empirical methods and the postmodern call for a rejection of many such methods. Charmaz describes postmodernism's rejection of many foundation positions from traditional sociology, but challenges practitioners to, rather, view the foundational statements of modernist sociology as beginning points for further research. "Rather than dismiss these theorists' explanations and predictions along with their foundational assumptions, we can consider the logic of their foundational questions." (p. 534)

Charmaz acknowledges some of the early narrow views of traditional sociology in the twentieth century as "naï ve." (p. 534) More recent work – whether rooted in modernist or postmodernist thinking – has looked at the many inherent inequalities on our social institutions and the roles such inequalities play in defining the institutions being analyzed. The focus on the individual as someone who's beliefs and meanings carry importance in understanding social structures has become the norm: "knowing persons must be located in their bodies and actions and that social inquiry must begin from this existential location." (p. 534) This more recent thinking leads to new ways to approach social analysis. Charmaz finds it ironic that the postmodernists tend to reject qualitative analysis at just the point in the profession's history where modernists were finally beginning to accept the usefulness and efficacy of qualitative methods alongside quantitative methods.

The postmodernist critique has done a good job of making practitioners increasingly aware of the relationship that always exists between the viewer and the viewed. Modernist researchers, both quantitative and qualitative, typically operate from objectivist preconceptions; believing that they were using their methods to obtain reliable and valid data from which they attempt to draw their conclusions. The postmodern critique forced a reflexivity among researchers; one that undoubtedly is improving the scientific rigor and validity of studies that would otherwise remain described as highly modernist in perspective.

Charmaz sees this reflexivity as a central value of the postmodern movement. She argues that postmodernism has successfully forced sociologists to abandon claims to objectivity and accept what has actually been true all along; that "ultimately science rests on consensus." (p. 537) As we accept that positivist approaches based on a perceived objectivity are inherently flawed; the search for an agreeable consensus requires that the net of participants participating in the dialogue be broadened. Marginalized researchers, and the participants in our studies, need to have a greater voice; through research, texts, and interaction. The profession of social science is improved as more and more marginal views are incorporated into an expanded and strengthened center,

Cosgriff, P. W. (2000). The right things for the right reasons: Lessons learned achieving CMM level 5. *Journal of the Quality Assurance Institute, 14*(2). 26-32.

The process maturity model highlighted in this depth component describes a five tiered improvement model for software engineering organizations. Relatively few software organizations have ever moved up to the third level of the model, much less to the top fifth level. Cosgriff describes lessons

learned when his organization, the Ogden Air Logistics Center in Utah, was certified as having achieved that much heralded fifth level.

Many in the software industry perceive the SEI's Capability Maturity Model as a complex and highly technical model. Coupled with the fact that the origins of the model are in the U. S. Department of Defense with its highly structured command and control model, it is not surprising that a U. S. military facility would be among those organizations that reach the model's highest levels of maturity. Cosgriff's observations, though, are that the importance of people, and the meaning they attribute to their work, should be considered the key driver in achieving high levels of process maturity. The major effort in achieving such improvement is to "change people's attitudes" (p. 28) and make the improvement "philosophy inherent in all (their) activities." (p. 30)

Cosgriff's observations indicate that focusing increasingly on people, meanings, and "common sense" (p. 32) can enable software engineering organizations to improve their process maturity, and that such focus can partly outweigh any bureaucratic or political obstacles that might otherwise inhibit such improvement. The quality improvement literature is plentiful on the need to improve top-down management activities related to process. This structural-functional approach is contrasted in this depth component with interactionist approach based on meanings. The instruments developed in the application component embed several of the lessons described by Cosgriff.

Gemes, K. (2001). Postmodernism's use and abuse of Nietzsche. *Philosophy and Phenomenological Research, 62*(2). March: 337-360.

Gemes argues against the postmodernist view, taken up by first by Lyotard, that the loss of the subjective self as a subject of analysis can, in some way, be traced to and supported in Nietzsche. He

builds on Nietzsche's use of the architectural metaphor in which the individual self-constructs identify through an appropriation of the past. Where many postmodernists see this metaphor as essentially deconstructing the individual, Gemes argues that Nietzsche was actually arguing for a goal-oriented unity for the individual based on an interpretive view of their past. Nietzsche describes this self-constructed self as the individual subject, where the postmodernists working with Nietzsche's writings tended to focus on the pre-construction individual as disunited and wandering. Gemes describes Nietzsche as arguing that the process of achieving natural unity based on such an appropriation of the past is a meaningful precursor to the appearance of the individual as subject; the opposite position from that often attributed to Nietzsche by postmodernists.

Gemes attributes this difference of interpretation to issues involved in analyzing the early and late writings of Nietzsche. Early works often discussed the unity of the individual, and often in positive ways; according to Gemes. Later works spoke of unity less frequently, and often with negative connotations. This shift opens the door, a view taken by many postmodernists, that Nietzsche changed his mind about the importance and role of individual unity during his writing career. The individual as unified subject all but disappeared from Nietzsche's later works.

Gemes argues that the shift toward a negative connotation for the individual subject was a result of Nietzsche's arguments against the Cartesian notion of a unified soul that dominated much of his later writing. Far from discounting the individual, Nietzsche actually was arguing for an emphasis on the self-constructing soul as an active endeavor for the individual precisely because he was denying the existence of a preexisting unified soul. Gemes argues that Nietzsche's earlier works have to be interpreted in light of his later work. His early focus on the individual as self-constructing identify was built on the premise that the Cartesian notion of the free soul was wrong. When that premise was denied by his audience,

his later writings worked to correct the problem. He hadn't changed his mind, argues Gemes; rather, he simply had to back-up conceptually to defend positions he had previously taken to be axiomatic.

His reasoning carries a parallel with the process improvement thinking described below in this depth component. His notion of the self-constructing individual couldn't take hold until the notion of the preexisting unified soul was removed. In general, a problem can't be solved until it is properly recognized and framed. Processes based on structural-functionalist thinking can't use symbolic-interactionist thinking until the problems inherent in functionalist thinking are uncovered. Gemes, using Nietzsche, is arguing for conceptually breaking down paradigms before new ones can be built.

Guimaraes, T.; Yoon, V. Y.; & Clevenson, A. (2001). Exploring some determinants of ES quality. *Quality Management Journal, 8*(1). 23-33.

Guimaraes and Clevenson look at quality determinants for a particular subset of the software engineering industry; namely, the makers of expert system technology. Expert systems technology is unique in the software field in that it attempts to build software solutions that embody the knowledge of its users, rather then simply enabling the processes and policies of those users. Guimaraes and Clevenson describe the focal point of such efforts as 'knowledge engineering,' and describe the difficulties of ensuring that an appropriate level of user knowledge is built into any software solutions. Much of the knowledge engineered into these systems begins as tacit knowledge among the experts who provide domain knowledge to the knowledge engineers.

Of the quality determinants described by Guimaraes and Clevenson, the role and involvement of users and management in providing access to their tacit knowledge - through observation, journaling, and interviews – is among the most important. Lack of such involvement results in software

development that is limit to explicit knowledge that usually is very good at handling routine situations, but fails at the slightest exception. The importance of tacit knowledge and perceived meaning is indicative of a shift in these efforts that parallels the structural to interactionist shift described in this depth component.

Guimaraes and Clevenson's findings are significant for the improvement of software engineering activities beyond simply expert systems. The role of tacit knowledge and meaning is obvious when engineering rule-based knowledge engines for expert systems. However, if similar tacit knowledge needs to be embedded in all software systems solutions, then Guimaraes and Clevenson quality determinants will apply to all software initiatives; increasing the role and importance of users in the entire software industry. The shift in process maturity models from software to systems to integrated teams may be tied to the underlying, but still not completely recognized, distinction.

Harauz, J. (1999). International trends in software engineering and quality system standards: Ontario Hydro's perspective. *Software Quality Professional, 1*. (2). 51-58 part 1; & (3). 30-36, part 2.

Harauz describes the complex web of national, industry, and international quality and software engineering standards that have been promulgated in recent years. His focus is on the inadequacies that crop-up when attempting to put together these numerous standards for application within a single software organization. Harauz's perspective is as a software quality engineer for Ontario Hydro; an area where quality management in software engineering is of critical concern in such a highly regulated industry. It is critical that the software designed to trip a nuclear reactor, and shut it down in the event of a problem or disaster, be of high quality. Part of demonstrating the quality of software is to be able

to demonstrate it. Ontario Hydro, and most other modern software organizations, rely on adherence to national and international standards as a cornerstone of their quality management program.

Harauz's finding is that the complex of currently available standards, in total, are inadequate for that task. While applauding the contribution of individuals standards efforts in identifying and defining aspects of quality in limited domains, Harauz laments that the standards can not easily be combined into systemic comprehensive quality guidance. He argues that it takes the intervention of people – professionals – into the equation as mediating agents. At Ontario Hydro, they have developed their own hybrid set of requirements in lieu of complete adoption of external standards because they view the weaknesses as too significant.

The nuclear power industry is among the few existing software-related industries in which the absolute demand for software quality is paramount. This makes Harauz's observations very important to the industry. Most commercial software organizations willingly accept weaknesses in their software engineering practices, and in the resulting software, as normal and expected outcomes of their engineering practices. As a result, most commercial organizations producing software will never make the effort to harmonize and synergize all of the available international standards. As such, they will never see the problems that Harauz has pointed out. As a result, many organizations will over-rely on standards that, in fact, contain unobserved weaknesses and contributions. The SEI Capability Maturity Model that is introduced in this depth component, and that is the focus of the application component, is one such model that has been widely adopted by industry, and yet is observed by Harauz's analysis to contain considerable weaknesses that can make its adoption risky for some organizations. A disclaimer and limitation, therefore, is appropriate for whenever it is used.

Jalote, P. (2001). The success of the SPI efforts in India. *Software Quality Professional, 3*(2). 36-40.

The process maturity model for the software industry described in this depth component consists of five increasingly more mature plateaus of process maturity. Few organizations have achieved certification against the highest level of process maturity in the model. Of those, about half are organizations in India. Jalote addresses this unexpected statistic and attempts to outline factors about the Indian work culture, either general cultural factors or factors that are unique to their software engineering industry, that might explain the unusually high success rate of organizations in India when implementing the SEI's Capability Maturity Model (CMM). Once identified, these factors might assist other organizations in their respective implementation attempts.

Jalote identified a number of factors, both in the definition of the software industry in India, and in the general cultural model that might be used to describe such organizations and individuals in India. Jalote's key industry finding is based on the fact that there exist very little software industry demand in India. India's software market is mostly devoted to export. The primary means of export today is through the provision of software engineering services to organizations that have contracted their software needs to these companies in India. India's software market is global, but is clearly dominated by the United States. From the American side of these relationships, one will hear organizations talk of 'outsourcing' their software engineering; or of having sent it 'off shore.'

These contractual links between organizations create an opportunity for the CMM to penetrate organizational thinking. It was originally developed to assist the U.S. government to better manage contract relationships with corporations. It therefore fits well with the need to manage project contracting across the Pacific. The remoteness of the software organizations in India necessitates their

exhibiting a high level of process maturity in order to maintain competitiveness in the American contracting market. Another advantage in the CMM success rate in India has been the fact that the entire software industry in India was born after the CMM was published and available. It became a building block for the seedling industry, and has had strong penetration ever since.

On the cultural side, Jalote observes that the India software industry tends to employ professionals with engineering training, while their American counterparts tend to employ individuals with business training and experience. Engineers are likely to gravitate toward defining models and heuristics. Likewise, individuals in Indian organizations tend to be very accepting of frameworks and models developed by reputable and authoritative outsiders. American counterparts tend to resist any model perceived to be imposed from outside; almost regardless of its quality. Also, professionals in India are far more accepting of being measured than counterparts in American organizations.

Jalote's observations don't bode well for improving American penetration of the CMM in software organizations. Introducing CMM to United States organizations involves overcoming inertia that simply didn't exist in the fledgling India software industry. Likewise, the reluctance of workers in the United States to readily accept top-down imposition of externally developed models may be a cultural factors that is extremely difficult to overcome. The existence of CMM high maturity organizations in America indicates that it is possible, but those organizations that have achieved success using the model tend to be larger organizations with strong contractual obligations. The more routine commercial software organizations are very poorly represented on the list of successful CMM software organizations. Jalote may have explained some of the reasons why.

Kontoghiorghes, C.; & Dembeck, D. (2001). Prioritizing quality management and sociotechnical variables in terms of quality performance. *Quality Management Journal, 8*(3). 36-48.

In a paper that compares and contrasts various aspects of total quality management (TQM) and sociotechnical systems theory (STS), Kontoghiorghes and Dembeck conduct an analysis that leads to a prioritization of various factors of both views with an emphasis on the importance and impact of social and human variables in achieving organizational success. TQM, they argue, requires a transformation of organizational culture that includes "individual attitudes, beliefs, and behavior." (p. 36) STS embodies a pairing of a social system with a technical system; contrasting the elements of people and technologies. "How well the social and technical systems are designed with respect to one another and with respect to the demands of the external environment determines to a large extent how effective the organization will be." (p. 37, citing Pasmore)

The authors discuss at length the various internal people factors that contribute to organizational success. They emphasize "social demands" (p. 26) and the ways STS can almost be accused of an over-emphasis on the social side of the organization. Within that caveat, though, they argue for organizations to place greater emphasis on "flexible structure that encourages adaptation" as well as trying to achieve "the benefits of simultaneous stability and flexibility." (p. 39) They advise "psychological ownership" (p. 39) of change and improvement in the organization. Of the dozens of variables that they look at that contribute to organizational success; they find that the satisfaction that individuals in an organization express in their own internal processes is the paramount driver when predicting organizational success. To the extent that such satisfaction can be tied, perhaps ethnographically, to the meaning that individuals place on the structures and functions around them, this

finding has implications for working toward individual meaning and satisfaction using the instruments developed in the application component of this knowledge area module.

Paulk, M. C. (1999). Using the software CMM with good judgment. *Software Quality Professional, 1*(3). 19-29.

Paulk is one of the original principal architects of the SEI Capability Maturity Model (CMM) described in this depth component, and analyzed further in the application component. (see Weber, Paulk, Wise, & Withey; 1991) In this article, he addresses many of the misconceptions and myths that have surrounded the CMM since its inception; primarily that it is written and intended to be used by large software engineering organizations, often conducting projects on behalf of large government agencies. True, the CMM was originally developed in response to concerns by the U. S. Department of Defense that software was becoming an increasingly mission-critical component of just about all major defense systems. It was also true that most early adopters of the CMM were such large and controlled software organizations.

Paulk, though, argues that it was never the intent of the CMM authors to create such a limited and isolated model. "Its fundamental concepts are useful to any size organization in any application domain and for any business context." (p. 21) In an argument that seems to lead directly to the distinction between structural functionalism and symbolic interactionism that constitutes a main theme of this depth component, Paulk observes that the CMM only truly makes sense if the structure it advises is properly interpreted by employees according to the meanings that each prescriptive component derives for those who will participate in its application. "The team has to discuss at length whether an implementation is adequate." (p. 21)

Paulk's call for common-sense is a call for interpretation; not a blind adherence to structure. For large organizations, like the early-adopters of the CMM, structural admonitions fit well with their own beliefs about their organizations and roles. But for more recent adopters – the small commercial software houses, the dot-coms – fixed structures as described by the formal language of the CMM are inhibitors because they contradict the culture and belief systems of the organizations and the individuals in them. Paulk's observations can be extended beyond the CMM because his argument applies equally to other quality and software models described in this depth and subsequent application components.

Pescosolido, B. A.; & Rubin, B. A. (2000). The web of group affiliations revisited: Social life, postmodernism, and sociology. *American Sociological Review, 65*. February: 52-76.

Lamenting the failure of postmodernists to offer a consistent and usable social model for conducting sociological analysis, Pescosolido and Rubin offer a network model of social interaction that builds on the work of Simmel's social circles. They begin by describing the various contentions of postmodernists that social forms are changing and that traditional modernist models of society and social interaction are breaking down. While acknowledging most of what the postmodernists have to say about such shifts, Pescosolido and Rubin argue that the postmodernist claim that new social forms are emerging goes too far. For all the change and ambiguity rightfully described by postmodernists, they argue that postmodernism fails "in its embrace of these characteristics as the new social form – mistaking transition for type." (p. 52)

They build their analysis on Simmel's descriptions of premodern and modern society as a set of social circles. Premodern social relations would be described by a series of concentric circles with the individual at the center. The circles expanded from the individual out through family, occupation,

religious, and political spheres. "Individuals experience few psychological 'tensions' because the small scale and the circumscribed nature of ties allows social actors to anticipate and accommodate conflict." (p. 55) After industrialization, Simmel describes the social circles as shifting; still overlapping, but not necessarily centered on the individual. Individuals now choose membership in their social circles; although the availability and eligibility to join certain circles is still constrained; offering advantages to those of position and power not necessarily held by others. "The unique configuration of membership in social circles, their number, and their degree of overlap define the individual socially." (p. 56)

Pescosolido and Rubin point out that because the reach of one's social networks can be quite extensive, one often sees a great deal of overlap in selected social circles as one's core involvements affect the choice of educational involvement, voluntary organizations, job and career choice, and even religious affiliation and activity. The shift from concentric to merely overlapping circles can be seen simply as the exercise of the increased choice brought on by industrialization and the separation of individual from organization. With social position now based on "information and choice, rather than kinship and place, modern social forms created trust in abstract systems and saw the rise of institutions." (p. 56) Organizations could now carry their own existence separate from the individuals in them.

Postmodernists are described by Pescosolido and Rubin as emphasizing the ambiguity, chaos, and failures of modern social and political agendas. "While they are right on target in capturing the spirit of rapid social change that characterizes the present era, their embrace of the resulting 'chaos' as a new social form is misguided; they mistake an era of societal transition for a new enduring social structure or even a hybrid of modern society." (p. 52) They offer, as an example, the postmodern focus on the rise of globalism as a defining element of a new social framework. Instead of seeing it as a new paradigm, Pescosolido and Rubin see globalism as the natural extension of social structure seeking the "largest

social circle" that is needed to contain the diversity of overlapping social circles for most individuals. As core family circles functionally grew to include tribal, community, civic, and regional scope in premodern eras; these gave way to the needs of the nation-state in modern times. A continuing transition to the global village becomes, not a new paradigm or framework, but an expected and natural extension of a process that has been occurring in social structure for a considerable time.

The authors acknowledge that the postmodernist approach is correct in seeing a simple overlapping-circle metaphor as too weak and limiting to describe the complex interactions and choices now available to individuals to define their own social spaces. Pescosolido and Rubin propose using a network model as an extension methodology. In such a network model, the individual as node is connected to any number of social circles, each of which no longer need to conceptually overlap the individual. The individual is now the collection of interactions to those social contexts. The organizations typically studied by sociologists only exist to the extent that individuals choose to be networked to them. Pescosolido and Rubin see a great strength in postmodernism in "suggesting that structure is a reification and that behind organizations, classes, groups, and political parties are the real lives of real people returns us to the central concern with how (mechanisms) and why (effects) larger contexts matter." (p. 60, authors' parentheticals)

"Network theory offers the potential to bridge postmodernism's concern with individuals' unique experiences and sociology's focus on social structure." (p. 62) Postmodernism's emphasis on discourse and texts implies social contact among actors, not necessarily physical face-to-face contact. Network theory emphasizes relationships over proximity, and so is wholly consistent with the postmodern perspective. Pescosolido and Rubin see that the modernist "tendency toward structural determinism can be countered by incorporating structural symbolic interactionism, which sees society as

a web of communications." (p. 62) Network theory recognizes that nodes can't be seen as overlapping if they are far apart along whatever dimensions they define themselves using. The issue of globalization sees geographic placement and distribution as defining dimensions. Other dimensions, such as purpose, strategy, and meaning can place social circles far apart even if geographically local.

In sum, Pescosolido and Rubin's approach to a network analysis of social interactions expands the variables under discussion. The traditional variables of circumference and density associated with Simmel's overlapping social circles expand to include beliefs, emotions, collective meanings, and experiences. These variables that define the strength of connections in the network become the interactionist half of a hybrid social theory that includes both structure and interaction. These two halves are the emphasis of this knowledge area module, and will provide variables for inclusion in the application component instruments.

Ryan, J. (2000). The internet challenge to the quality profession. *Software Quality Professional, 2*(2). 54-60.

Ryan describes the various quality and process-related problems facing the software industry today, with a special emphasis on the importance of improving process practices in the Internet segment of the industry. He describes how the Internet software industry was born so quickly, and has grown so rapidly, that software quality practices have failed to keep pace. Jalote (2001) described how the software industry in India was able to adopt significant process quality practices precisely because the industry was born with such practices already existing and in use. The Internet community in the United States did not take advantage of those models as the industry was born. Software and process maturity

in the Internet community is no better, and Ryan observes that it is often much worse because of the pace of activity, that any other segment of the software industry in the United States today.

Ryan observes that fixing this problem will require much more than a structural or functional change. The various change models available in the industry, driven largely by the CMM discussed in this depth component, are often implemented in a purely structural way. Ryan warns that people must be considered a key dimension of any successful implementation; particularly one in which the knowledge is changing so fast that it remains tied to the personal experiences and meanings that participants associated with it. This hints at the interactionist approach presented below. If so, a hybrid of functional and interactionist approaches may work best. Such a hybrid is the intent of the instruments developed in the application component.

Weimer, A. L.; & Munyan, R. J. (1999). Recipe for a successful system: Human elements in system development. *Software Quality Professional, 1*(4). 22-30.

Weimer and Munyan write of a need to increase the human element in a software industry where quality and process models usually rely on increasingly complex and sophisticated functional and structural relationships among organizational components that specialize in only parts of each software engineering challenge at hand. Their 'recipe' includes many traditional management suggestions for improving the success of organizations in the software industry; but it focuses on several particularly non-traditional aspects that are highly reminiscent of the structuralism vs. interactionism distinction that is the focus of this depth component.

They focus initially on increasing end user involvement in all software initiatives. This "helps create user motivation and commitment, and this leads to system success." (p. 25) Expanding

involvement in managing the organizational changes often associated with major software-driven implementations also requires individuals to change in ways not implied by the structural definitions of how they function within the organization. "They must be prepared for the change psychologically and professionally." (p. 25) Such change turns them into "advocates" (p. 25); enabled by the way they change their own actions through their own interpretation of the meanings of the changes brought about through the software initiatives.

The survey study that Weimer and Munyan report found combinations of structural and human factors as being important for software industry success. They observed that the software industry is typically not known for any emphasis or consideration of human factors; and yet human factors ranked highest in priority among their survey respondents from throughout the industry. "Survey respondents may have ranked human element items as most important precisely because they are not included." (p. 27) If so, the instrument developed in the application component may touch a latent nerve on projects where professionals and participants would like to see less structural and more human/interactionist elements brought to the software project process.

Chapter 1

Introduction

Overview

The breadth component of this KAM introduced various social theories using a model developed by Burrell and Morgan (1979). Their four quadrant model allowed alternatives to the dominant functionalist paradigm to be identified and discussed without being overrun by functionalist considerations that drive most social theorizing. Within that framework, the types and varieties of functionalist models for social theory were explored. Within the paradigmatically dominant functionalist quadrant, the structural-functionalists dominated among the functionalist in modernist social theory.

Objectives

In this depth component, I explore some of these principles of modern sociology developed in the breadth component by shifting into the postmodern perspective; focusing specifically on aspects that appear to inform on change models used throughout my information technology (IT) industry today. Specific depth component objectives are:

1. Compare and contrast the specific postmodern social theories based on structural-functionalism and symbolic-interactionism.

2. Synthesize and integrate these theories into a framework for discussing and understanding social change in organizations of various types and structures.

3. Explore and evaluate how such a framework can be applied to a group of emerging information technology industry-specific social change models.

Looking Ahead

The standard IT change models available to the industry, most notably the Capability Maturity Models from the Software Engineering Institute, do not specifically address sociological issues, yet most of their content rests on aspects of functionalism and interactionism discussed in the postmodernist literature.

This depth component will explore the social theory dimensions and issues raised in postmodern writings, and the application component will explore how those issues affect the use of such models in practice. The social aspect of these issues will be developed into an instrument that can be used by software engineering projects looking to allow some of the postmodern social aspects of social theory to have a direct impact on project thinking and action. Such impact is not expected to be dramatic, rather, it is expected to slightly influence project actions by making social feelings and beliefs that are normally hidden within project teams and project team members more visible and explicit.

Chapter 2

Postmodernism

This section introduces and explores postmodernism as an alternative or extension of modernism before the specific postmodern concept of symbolic interactionism is covered in the next section. General postmodern themes and early writers are highlighted.

Postmodernist Themes

Ritzer (1997, citing Rosenau) lays out six central themes that differentiate postmodern social thinkers from modernist social thinkers:

1. Postmodern thinkers tend to be very critical of modern society. They argue that the modernist search for truth has consistently not led to universal and positive outcomes; rather, society disenfranchises and fails to deliver for the many who are marginalized by the centralizing focus of modernism.

2. Postmodernists reject world views and grand narratives. They focus on understanding the subjects and narratives being discussed without the need to develop broader encompassing meta-narratives. To Ritzer, "there can be no grand social theories because theorists are inevitably embedded in their own peculiar social circumstances." (p. 13). Postmodern social theory will always be local.

3. Postmodernism reemphasizes elements of social discourse that predates modernism, but that have been pushed aside in modernist theories as unscientific and uncontrollable. Issues such as emotions, feelings, reflection, introspection, speculation, customer, and myth become important inputs to social thinking, rather than being phenomena that are to be explained by modernist theories. These factors must be understood as independent phenomena that contribute to the definition of the social

structures being analyzed. They are not outcomes that can only be understood by building up a set of laws and social theories from which these phenomena arise.

4. Postmodernists reject the boundaries that delineate fields of study within modernist traditions. Since espousing covering laws is not only unnecessary, but undesirable, firm boundaries within which disciplines can be developed are unnecessary.

5. Postmodern writings tend to reject the careful academic reasoning style of modernist writings in favor of more literary styles that allow for a great range and impact of emotive and mythical aspects of the subjects being discussed.

6. Postmodernists focus on the perspectives of the periphery of society, while modernists tend to emphasize central and consolidating aspects. The correctness of the core is valued by the modernists, while the inclusion of the margins is valued by the postmodernists.

In addition to these six themes, Ritzer (1997, citing Seidman) also describes five conceptual weaknesses in perspective exhibited by modernism that provide postmodernism with more power to explain phenomena:

1. Scientist. Modern theorists look for universal ideas; for social laws. The process of accumulating a large body of knowledge is punctuated by expectations that breakthroughs will provide consolidating impacts and clarity to fields of endeavor.

2. Foundational. The behavior and practice of modern analysis rests on firm and established philosophical foundations. Theorists intend to uncover the logic and laws of society. Context is removed in order to describe humanity's universal condition. Seidman (1994) recommends that social theorists renounce the search for general theories characteristic of foundationalism. The result is a social theory based on social narratives. He sees many of the grand theories as describing "stories of social

development and crisis" once the foundational generalizations are removed. (p. 128) As such, he recommends an analysis through an event-based narrative; meaning on in which the spatial and temporal context always remains, with no effort to generalize into grand theories. That doesn't mean that broad social narratives can't cover large periods of time and space, just that the generalizing themes of progress and development should be lessened and replaced with an emphasis on actual events and meanings in those particular times and places.

3. Totalizing. The modern view is meant to be true for all time and place. The scope of theory is broad enough that progress can be seen to occur within the model; rather than change being seen as actually altering the model. As a result, social theory becomes normative; particularly with respect to the historical emphasis of Western society in social theory.

4. Essentialist. Individuals within society are seen as having basic and unchanging needs. Social acts are, therefore, characteristics of these human essences; rather than taking individuals as clean slates and attributing actions to the social conditions that bring them about.

5. Insularity. Modernists, in their effort to built coherent closed systems of thought, tend to migrate toward issues of interest to other social theorists. Much that is written as social theory becomes meta-theory; social theorists talking to each other and becoming increasingly disconnect from the individuals in the social groups they are explaining.

Ritzer acknowledges that providing a list of six central themes and five conceptual weaknesses is, contrary to the desires of the postmodernists, a decidedly modern view of postmodernism. (p. 8) Postmodernism can only be explained using the tools of modernism precisely because postmodernists will resist having to define and explain postmodernism.

Smart (1993) outlines other dimensions associated with the shift of thinking to postmodernism. He contrasts the critical view that postmodernism seeks to deconstruct modernism and resist the status quo (what he calls "critical postmodernism') with the more positive view that postmodernism offers a culture of eclecticism that celebrates the status quo (what he calls "affirmative postmodernism"). (p. 19) The former of these he also refers to as a postmodernism of resistance versus the latter as a postmodernism of reaction. These positions mark a continuum along which individual theorists and contributors will fall in their viewpoints.

Views of Postmodernism

Antonio (1998) describes postmodernism as embracing an aesthetic over a rational dimension. He sees 'structure' and 'society' being displaced by the much broader concept of 'culture' as that aesthetic dimension impacts the level of analysis in social theory. He argues that postmodern is not productive precisely because it rejects existing epistemologies, and attempts to refute accepted methodological conventions. (p. 23) Proponents would argue, conversely, that the productivity of postmodernism lies in those rejections and refutations.

Lyon (1994) offered a view on postmodernism based on the development of thinking over time, starting with the idea of providence and moving forward to the idea of progress. Providence was goal-oriented, and often religiously based. The world had rules and direction that could be discerned. As modern methods of study emerged, providence gave way to progress as the providential goals gave way to scientifically oriented choices and developments. Modernity emerged as a search for rationalized progress. The value-based perspective of providence gave way to a neutrality that valued constant progress. Lyon argues that such neutrality was actually a hollowing out of values. As modernism advanced, the complexity of that progress and of the underlying rules that were being

discovered made the search for universal truth appear more and more futile. The result of this direction, of indiscriminately increasing relativism, would be nihilism. Lyon describes postmodernism as an alternative to this shift toward nihilism. While nihilism would be a surrendering to the relativity emerging in modernist study, postmodernism would be an embracing of it; an alternative in a positive direction. (p. 5-7) Echoing Nietzsche, Lyon describes nihilism as "an anchorless sense of reality," and postmodernism as a sense of firm but multiple realities. (p.8)

Schiralli (1999) looks at the friction between modernism and postmodernism using an analogy based upon ballet and modern dance. He sees modern dance as emerging from the hidden deformities and pitfalls of ballet; the distortion of dancers learning to go on pointe even at the expense of physical pain and damage to themselves and their careers. Modern dance rejects the notion, first that such deforming behavior is necessary at all, and second that one should attempt to pursue it simply because it is a fundamental tenet of what it means to dance ballet. Such pursuits, so highly valued by those in ballet, is seen as completely misguided by those in modern dance. Those in the old school, the modernists, see the world through different conceptual filters than those in the new school, the postmodernists. (p. 9-11)

A conceptually complicated view of postmodernism is offered by Hassan. (1987) He sees postmodernism as suffering from what he calls semantic instability; suggesting that no clear meaning exists among scholars. He describes the postmodern as the embodiment of "indeteranence," (p. 87) a term he coins from a combination of indeterminacy and immanence. The two halves of this concept offer both a historical and theoretical perspective on postmodernism that he sees as inseparable because he sees postmodernism as a diachronic and synchronic construct. From indeterminacy he draws ambiguity, discontinuity, pluralism, randomness, and deformation. From immanence he draws the

capacity of the mind to generate itself in symbols and of man to act on itself immediately in its environment. Together, these concepts describe a postmodernism based on diffusion, dissemination, interplay, communication, and interdependence.

Hassan sees people as communicating creatures that determine their own universe through symbols of their own making. (p. 92-94) Hassan's view of the postmodern is very conceptually difficult, but it is one of the few that aren't defined in terms of difference from, or contrast, with modernism. He suggests that postmodernism needs a better name, precisely because "the postmodern is awkward." (p. 87) It contains the modern referent that it seeks to avoid.

In a similar vein, but in another direction, Calhoun (1995) doesn't contrast modernism and postmodernism. Instead he sees postmodernism as an internal part of modernism, and sees efforts to isolate postmodernism as a discipline as potentially trivializing of the very differences and perspectives that postmodernists claim to value and want to put forward for study. (p. 97) He argues that postmodernists are misleading to claim that the presence of ambiguity and ethnocentrism in past theories constitutes grounds for their rejection or relativization. He grants that the postmodern attitude avoids the tendency toward intellectual domination by the core; but suggests that the way in which postmodernism gives place to the marginal by discounting or ignoring the core only trivializes the position of all. (p. 98)

To Calhoun, modernism has had to face two significant problems while growing to understand the two major social forces of capitalism and bureaucracy: problems of the self, and of agency or others. Postmodernism looks to address these problems also; but he argues it is a mistake to claim that such problems are new to postmodernism, and missing from modernism. He suggests that "we need to incorporate the insights of postmodern thinkers into a richer sociological approach to the entire modern era." (p. 99)

Best and Kellner (1997) describe the postmodern in deconstructing terms as "specific shifts within virtually every contemporary theoretical discipline" and in constructing terms as "the coalescing of these changes into a larger worldview." (p. xi) This friction and dichotomy plays some role in virtually all postmodern theories and writings.

Early Postmodernism

Early postmodernist writers were largely economists looking at weaknesses they saw in modernist coverage of the dominance of capitalism and bureaucracy in sociological thinking. They challenged the modernist assumptions and paradigms that they saw as embedded in the logic of modernist presentations.

Jean-François Lyotard

Lyotard (1979) saw society as the interaction of individuals through language. In stark contrast to the structural functionalists who saw individuals impacted and directed by the social structures in which they interacted, Lyotard described those very structures as the direct result, or outcome, of the assembled interactions of the individuals making up the social groups being described by the social structure. Structural function is, for Lyotard, an output of social interaction, not an input. (p. 16) Understanding Lyotard requires looking at his attitudes and positions with respect to language and the ways in which language drive the essence of social interaction, including interaction with the self.

Lyotard contrasts the modern with the postmodern. The modern, he argues, legitimates itself with reference to a metadiscourse, or grand narrative. The postmodern presents an "incredulity toward metanarrative." (p. xxiv) Metanarratives, or narratives about narratives, are a synthesis of what is said in the dialogue of narrative knowledge. Just as social structure is not society, but an outcome of society; so metanarrative isn't knowledge, it is an outcome of knowledge. The legitimacy of that outcome must

be based on the legitimacy of the original narratives. This drives the postmodern interest in narrative and text as a primary source of new knowledge; in terms of content, but also in terms of the legitimacy of the source.

Legitimacy is traced, following Wittenstein, to the language games through which individuals interact. In these games, there are rules for the various types of utterances that occur during interactions of individuals. These rules provides roles and legitimacy to the sender, addressee, and referent of each utterance; and will vary by the type of utterance (e.g. denotive, performance, prescriptive, questions, promise, narrative, etc.). The legitimacy of an utterance is dependent on the perceptions of the individuals taking part in the utterance. (p. 8-10)

Lyotard doesn't claim that language games account for the entirety of social relations; but they do represent his general methodological approach. (p. 15) The language moves in these games represent the observable social bond. Individuals are not observed in isolation, but as always located at a point through which various kinds of utterances and messages flow. We know of individuals through their interaction with others, even if the generalized other of self. Smart (1993) describes these games as making up the life world; "a communally produced and traditionally validated assembly of meanings." (p. 75) A postmodern sociology will be concerned with the processes of struggle through which social relations are defined.

To understand social relations then, Lyotard requires not just a theory of communication (i.e., What is being communicated?), but also a theory of games (i.e., Why is it being communicated?). He accepts a pseudo-behaviorist agnostic view; that the strategy of the game will remain unknown and unknowable except to the extent that it can be inferred from the observed moves of the game. Methodologically then, Lyotard calls for the observation of the social as a flexible network of individuals

taking part in language games. Of the types of utterances that occur, new or communicated knowledge will often be in the form of narratives; narrative knowledge. Since texts are typically the outcome of recording such narrative knowledge, Lyotard and other postmodernists will emphasis the analysis of texts as the cornerstone of the postmodern view.

Lyotard doesn't completely discount the modern in calling for this postmodern methodology. He describes the postmodern as "undoubtedly a part of the modern." (p. 79) The modern looks at the social and sees individual interactions driven by social structures and necessary functions; often to the point of bureaucracy. Lyotard simply sees these social structures as emergent from the interactions, as precursors that define and create the structures being described. Postmodernism is not an end to modernism, but a view of modernism "in the nascent state." (p. 80)

Calhoun (1995) describes Lyotard as rejecting, as unacceptable meta-narratives, the notions that society is a functional systemic entity or that society is a conflictual field held together by power. (p. 109) Postmodernism would refocus the view and understanding of the modern away from capitalist-bureaucratic wealth accumulation, centralization of power, social movements, state power, and globalization. Lyotard reduced, in large part, the social to the linguistic; seeing the observable social bond as composed of language moves. He saw society as atomized into flexible networks of language interactions. The prominence of capital and bureaucratic institutions didn't challenge Lyotard's views. He saw these things as simply outcomes or provisional results of the execution of these atomistic language strategies. (p. 110)

Lyon (1994) describes Lyotard as one of the earliest thinkers to exhibit the themes and perspectives associated with postmodernism. (p. 12-13) Lyotard challenged the notion of grand narratives that were often heralded as the peak of modern knowledge. He lamented the fragmentation

of knowledge ensured by the continuing sub-specialization of scientific disciplines. Anticipating the direction that many postmodernists would take in terms of text and language as cornerstones of interaction and knowledge, Lyotard described intellectuals as no longer legislating knowledge, but interpreting it.

Through the atomization of the social, individuals become bound up in local language games through which meanings and social constructs must be interpreted. He saw science and economic life gravitating toward a common communicative theme, "that there is no reality unless it is confirmed by a consensus between partners on questions of knowledge and commitment." (Lyotard, 1993, p. 9) The postmodern, according to Lyotard, was part of the modern; but illustrated that the interaction and agreement of people – through language – was a key element in the establishment of truth. Objective science needed to be reframed; and the role of language in knowledge needed to be rethought. (p. 12)

Jacques Derrida (1930-)

Derrida also saw cultural life as involving the texts and language that we produce; each interpreted in light of other texts in a continual strand that can never be completely unraveled. Lyon describes Derrida's challenge of deconstruction; where by denying that any text is settled or stable disrupts modernist logocentism because of the constant indeterminancy of language. (p. 14) Texts subject to interpretation in context can never form the basis for firm logical knowledge in the modernist sense. In the contingent world of text, social theorists must accept the less objective position of insider because the mind is always renewing and redefining texts. Objective truth gives way to subjective agreement.

Michel Foucault (1929-1984)

Calhoun (1995) describes Foucault as setting the stage for postmoderism through his discussion of historical ruptures, the repressive nature of modernity, and the arbitrariness of any construction of a disciplinary subject as a conflict between knowledge and power. (p. 107)

Foucault formalized this reduction of logocentric truth by looking at the history of ideas that make up the human sciences; their genealogy. Lyon describes Foucault's theme as centering on the loss of causal connections in science. Ideas can be traced through their descent, and causal connections might be assumed, by no origins are to be sought in such connections. (p. 15) Calhoun emphasized Foucault's stressing of the ways in which internally coherent modes of understanding lost their grip and were superceded by relativistic and margins traditions of the postmodern. (p. 107)

Jean Baudrillard (1929-)

Baudrillard rejected much of Foucault's direction, instead looking to a shift in the media of modern communication. The shift from words to images, coupled with the rise of consumerism, further pulled meaning from any words. Exchange becomes symbolic more than physical, and the words used to drive the culture take on new roles in creating images. Lyon describes Baudrillard as fearing an unprecedented destruction of meaning Cultural artifacts would take on the role of transferring meaning in a society in which words largely lose their meaning in support of consumer and capitalist needs.

Calhoun (1995) described Baudrillard as explicitly devaluing the social/text in favor of the cultural/image. Modernity was the era of power and the production of commodities. Postmodernity would be characterized by the era of sign and the seduction of consumers. (p. 108) The sense of the use value of commodities central to modernism would give way to the symbolic value – often in contrast to a commodity's labor or material content or commercial value – celebrated as postmodern.

Chapter 3

Postmodern Functionalism to Interactionism

This section explores the transition from the modernist structural-functional social theories developed in the breadth component to the postmodernist theory of symbolic interactionism. Interactionism can be viewed as an explanation of what takes place within the modernist structure, or as an alternative way of approaching social interaction generally according to the various postmodern perspectives described in the previous section. For this depth component generally, and for the instruments tested in the application component, the interactionist view is taken as an explanation of what is happening within the structural-functionalist framework implemented within the professional workplace.

Structural Functionalism

The breadth component covered functionalist social theories, introduced the specifics of the structural functionalist framework. Burrell and Morgan (1979) describe the functionalist position in modernist sociology as dominant. Management theory generally has been informed by these functional and structural positions. The relationships between the needs or imperatives of the social group and the functions and structures that emerged to meet those needs was described using the writings of Comte, Spencer, Durkheim, Pareto, Malinowski, Radcliffe-Brown, and Parsons. Each offered a perspective that saw the structure of interaction guiding and informing the functions performed, and needs satisfied, within the social network. Baert (1998, p. 37-9) summarizes three core themes of this functionalism in the twentieth century:

1. Functionalists use the stability or equilibrium of a social system to explain the persistence of social practices in that system, referring to the effects of those practices as beneficial to the social system in which they are embedded, even if unintended;

2. Functionalists presume social rationality; usually positing that apparently irrational observed actions can be made intelligible to the observer if their social function can be discovered and understood; and

3. Functionalists identify with prerequisites, a social system having needs that must be fulfilled in order for the social system to survive and thrive, or else society operating in such a way that such needs are met. The link need not be causative.

Against this backdrop of function and structure, the postmodernist viewpoint looks inside the box at the meanings and interpretations of interactions among actors that take place within the functionalist structure.

George Herbert Mead (1863-1931)

Poloma (1979) describes symbolic interactionism through the writing of Blumer, who built upon Mead's social psychology. Ritzer (1991) also traces Mead to Blumer, but points out facets of Mead's thinking, particularly with respect to psychological behaviorism, from which one can argue that Mead was investigating an arena that led away from interactionism; placing Blumer in more of an originating position in the field. (p. 189-190)

The Act

Mead looked at an interaction of the individual and the social in a synthesis in which he placed the role of the act as central. Hewitt (1994) defined the act the smallest meaningful unit of conduct that can be extracted from human behavior. (p. 66) Going well beyond behaviorism, Mead took the act to

be the primitive unit for analysis rather than an emergent property of behaviorist thinking. (Ritzer, 1991) The act, for Mead, was constituted through four stages that interrelated; not linearly, but dynamically. The first stage – impulse – involves the sensation of a need and the various natural impulses to satisfy that need. Humans are set apart from less conscious or unconscious animals in that various cognitive states will typically mediate the impulse and its satisfaction. Mead's language was highly philosophical, much denser in tone: "All perception involves an immediate sensuous stimulation and an attitude toward this stimulation which is that of the reaction of the individual to the stimulation." (Mead, 1938, p. 3) His concept of attitude toward the response included the internal imagery generated by the response; a kind of built in feedback loop.

Such mediation includes perception, Mead's second stage of the act, through which the individual seeks alternative solutions to satisfy the impulse. The perceptions of the actor will include both external stimuli in the environment, but also their own thinking and awareness of such perceptions. Mead emphasized the selectivity of the perception itself, not just its sense-based characteristics. He described senses as important preconditions to perceptions, but limited their role to the initiation of the perceptual stage. (Mead, 1938, p. 8-9) Individuals choose what to perceive, and the level to which things are perceived, through a complex process that involves memory and the prioritization of need. Perceiving the details of the impulse will always involve an interaction of both the actor, and the environment. The process takes time, with the effect produced in the individual – the perception – occurring later that the sensed disturbance or original impulse that might have triggered the perception in the first place.

Mead (1938) raised the question as to why we perceive what we do in the world given the enormous volume of actual sensory input available to act as impulses. He attributed two different

attitudes toward perceptual objects: 1) immediate experience, where actual contact and proximity bring the object to our awareness, and 2) reflective analysis, where we resolve sensory objects into their significant and noticeable features based on features we find culturally or socially significant. Such significance will extend far beyond physical characteristics. (p. 14) It is this socio-cultural aspect of perception that will play an important role in creating social acts.

The third stage of the act – manipulation – affords the individual the opportunity to pause and reflect on the act. Whether the manipulation is of physical objects in the environment, or thoughts and memories in cognition, manipulation injects the temporal delay seen as important in Mead for differentiating human from nonhuman acts. It is through such pause that a diversity of alternative directions for the act come about; eliminating reliance on simple instinctive response. (Ritzer, 1991, p. 195) Mead described the importance of an assumption of knowing a perceptual object in order to be able to manipulate it, mentally or physically. Identifying the object, and adjusting attitudes towards it, is itself a form of conduct that mediates part of the act of which such conduct forms the manipulative stage. Past and present awareness of one's knowledge or awareness becomes a distinct field of experience separate, yet connected, to the physical or worldly reality of the driving act. (Mead, 1938, p. 16) Importantly, in so acting, we cease to act on an object in the real or external world. Instead, we manipulate our knowledge and attitudes about the objects in that world. Objects take on a host of secondary qualities not readily available to the sensory world alone. (Mead, 1938, p. 19-21)

The fourth and last stage of the act – consummation – involves carrying out one or more of those possible alternative conclusions to the act. (Ritzer, 1991, p. 196) Manipulation enables multiple possible consummation scenarios. Mead describes consummation as collapsing the manipulated possibilities into an external reality. (Mead, 1938, p. 24)

Gestures & Significant Symbols

While the idea of the act explored the stimulus to response path that occurs within an individual, the act must involve two or more actors to be considered a social act. The gesture, or outward manifestation of the social act, constitutes the building block of the social process for Mead: "gestures are, then, early stages in the overt social act to which other forms involved in the same act respond." (1932, p. 188) While many species can interact through instinctive gestures, only humans have the ability to interact through significant gestures. Ritzer (1991) describes Mead's significant gesture as one that requires thought on the part of the actor before a reaction can be expected to take place. (p. 197)

Mead saw the development of language, of vocal gestures, as a true differentiating event in the development of social interaction and social structure. "It has been the vocal gesture that has preeminently provided the medium of social organization in human society." (Mead, 1932, p. 188) Language allows symbols used by one individual to evoke predictable meanings and responses in other individuals in ways that non-vocal gestures can not. Physical gestures, while potentially evocative, are difficult to depend upon for significant communication during complex interactions. Ritzer describes Mead's position as taking language to be the most efficient, pragmatic, significant symbol system available for the building of complex social relationships, the interactions of which form the basis for modern and postmodern societies. (p. 198)

Inner Processes of Mind

Even the act without a social component, the introspective gesture, is made more efficient with language. The use of significant symbols, within ourselves and amongst each other, enables the complex forms of social interaction necessary to allow our complex social organizations to emerge. "Thinking involves talking to oneself." (Ritzer, 1991, p. 199) Individuals can delay their response to stimuli while

they carry out conversations with themselves regarding the meaning and their interpretation of the stimulus. This internal conversation embodies Mead's manipulation stage of the act. Ritzer points out that, in addition to simply being able to reflect on and respond to stimuli, humans actually pick out which stimuli to pay attention to and react to. They aren't limited to instinctive response, even being able to ignore stimuli that they decide have little or no meaning for them. (p. 201)

Ritzer describes meaning as arising not just out of the reflection and thoughts of the individual, but from the relationship between the gestures of the individual and the response to those gestures evoke from another individual or group in the social act. "It is the adjustive response of the second organism that gives meaning to the gesture of the first organism." (Ritzer, 1991, p. 201) The mind, the collection of intended and unintended meanings, is not in the head; it is a social phenomenon. Ritzer describes the mind as that which is able to respond to the world and put forth organized responses to stimuli that it chooses to see meaning in.

Self & Other

Ritzer (1991) describes Mead's notion of self as an ability to take oneself as both subject and object of thought. (p. 202) It is only though communicative social processes that one's self can develop; seeing oneself as the target of communication. Once developed, the self is established and can exist independent of social interactions. But in social interactions, the self makes it possible to monitor our own interactions with others; allowing our own gestures to become stimuli to which we assign meaning and react with additional gestures. We become able to observe the social act objectively because we can place ourselves into the social arena as one of many actors.

Able to see ourselves as objects, we're able to identify actors as other than ourselves. The generalized other of Mead allows us to abstract from our own inner experiences to view gestures from

outside of the social exchange. To be a self, and for there to be others, we must exist in a social community that shares enough common values and meanings to be able to interact through gestures. The concept of other would make no sense unless we could presuppose at least rudimentary shared meanings for common gestures. We recognize differences among each other, but come to depend on common similarities. With differences, "people have multiple generalized others, and, as a result, multiple selves." (Ritzer, 1991, p. 205)

Society as Interaction

Preceding both mind and self, because of its prerequisite formative role in both, society is the on-going social process of acts, gestures, significant symbols, and mind exchanges among self and others. Mead sees society as the set of organized responses that are taken over and carried forward by individuals. "Individuals carry society around with them." (Ritzer, 1991, p. 207) Institutions form within society around common meanings and responses. Mead views social institutions as giving form to interactions among individuals in which their interpretation of meanings give rise to gestures that evoke related responses and actions in others. Society emerges through such interaction, and meaning mediates between stimuli and responses.

Symbolic Interactionism

Symbolic interactionism goes beyond the functional structure of society to look at the meanings associated with interactions within such a society by those individuals who make up that society. As described by Mead, it looks at the affects such meanings play in determining those interactions; such that the way in which individuals interact is at least partly determined by those interactions themselves; and the history of meanings that those individuals bring to those interactions. It brings an increasingly subjective outlook to what is otherwise describable more or less objectively.

Rose (1962) sets out symbolic interactionism based on five assumptions regarding the distinctive characteristics of humanity, drawing upon Mead's interpretation of the implications of the social act. The first assumption is that we live in a symbolic as well as physical world. (p. 5) Rose defines symbol as a stimulus with a learned meaning. When we respond, we respond to the meaning of the symbol, not to the sensory stimulus of the symbol itself. We respond to what the symbol means, which can vary from individual to individual, and context to context. Because we learn most symbols through communication, we can expect to have relatively shared meanings form many symbols commonly communicated amongst ourselves.

Rose's second assumption describing symbolic interactionism takes advantage of this expected commonality of meanings. Through symbols, it is assumed that we can affect the stimuli-response pattern of others. (p. 7) In other words, we communicate using symbols as much for the way we presume others will assign meaning to them as in how we ourselves assign such meaning.

For such communication to be meaningful, we must adopt Mead's role of other in order to anticipate the possible meanings and responses of others. Such communication will utilize significant symbols; symbols which need not be understood in the same way by others that receive them. As a result, we can not actually control the response of others, only have an affect on that response. The communication is, then, an example of Mead's social act where both the communicator and the recipient must negotiate the shared meaning assigned to each symbol exchanged. The meaning is not in the sound of the words, but in each actors interpretation of any evoked images, that brings about the socially constructed meaning.

Rose's third assumption is that through this on-going exchange of symbols, we can learn a large number of meanings and values from those with which we exchange symbols in social interactions. (p. 9)

In this way, typical adult behavior in society can be said to have been learned from previous accumulated social interactions rather than through any form of natural trial and error interactions. This collection of accumulated meanings and values will constitute the culture within which social interactions take place; increasing our ability to predict others' meanings for symbols we might choose to use in our interactions.

Charon (1995) asserts that as individuals, we depend upon society for our symbols. Indeed, as individuals we would be without a symbolic life if we were not embedded in our symbol rich culture. "Complex human life demands and depends on human symbolic life." (p. 36) Through this shared culture, we become able to predict the actions and behaviors of others. Our predictions are based on our own expectations for behaviors that would be implied by the common meanings and values that we expect others with whom we interact to share. When they do not, we adjust our expectations for future interactions..

Rose's fourth assumption is that these symbols do not exist in isolation, but will accumulate into clusters and packages of symbols and assumptions upon which we will rely in our own communication and interaction. (p. 10) Among these clusters of meanings, roles emerge as collections of shared meanings that govern specific types of interactions in specific types of settings. Structures emerge as clusters of meaning that define relationships among actors that take part in socially meaningful interactions. These roles and structures serve as the observable components of the modernist functional-structural view of society where internal meanings are unacknowledged or unobserved.

The final of Rose's five assumptions is that thinking is the process by which symbolic alternatives are considered and evaluated according to the individual's meanings and presumed meanings of others. (p. 12) Action is taken as a result of these evaluations, and the meanings that form the priorities in

making the choice of action. The first four assumptions for the basic for interactionist communication; and this fifth assumption enables it to take place.

Erving Goffman (1922-1982)

Goffman extended symbolic interactionism to encompass the friction that occurs in each actor when there are differences between what people expect the actor to do and what the actor may actually want to do. Ritzer (1991) describes Goffman as focused on dramaturgy, or the series of dramatic performances each actor plays throughout life as they enact their own resolution to this friction. (p. 216) Dramaturgy defines the self not within the actor, but in the played out interaction between actor and each social situation.

Although an interactionist, Goffman recognized that many dramaturgical roles were preestablished based on societal expectations and norms. We don't completely choose our selves, rather, we cast ourselves into roles that are already defined and scripted by our culture and society. We may alter the characters, but only within the limits of how the roles are defined. Applying symbolic interactionism to professional interactions, as is suggested in the application component, is in part based on the assumption that certain professional roles in which we cast ourselves are already preexisting. The implementation of structural models in a profession, as well as the recognition of the interactionist responses of individuals in such a profession, rests on the premise that certain roles are already established, and that actors in the profession will vary their performances from stereotyped scripts in moderate and predictable ways. Without such an assumption, no practical basis would exist for applying these concepts.

Pragmatic Bias

As a socially-based approach to understanding the interactions of individuals in various contexts, Huber (1973a) argues that symbolic interactionism contains inherent biases that are inherent in the methodology's underlying pragmatism. She argues that pragmatism looks for the validity or truth of propositions in their usefulness of outcome rather than they logical deducibility from previous experience and theory. Knowledge requires experience to identify the meaning associated with actions so that their inherent correctness or usefulness can be established. "What counts is not the origin of a proposition but its outcome." (p. 276)

With a de-emphasis of origins, Huber argues that the sociologist is forced to conduct research during which logical constructs and social conventions are allowed to emerge from the interactions actually observed and inspected in the field. Symbolic interactionism, then, is a tradition whose "epistemology … makes it reflect the social biases of the researcher and of the people whose behavior is observed." (p. 275) If observation need not be pre-grounded in theory, then any outcome will be valid. Without theoretical grounding, researchers will see what they are expecting to see based on their own views of the social world and the interactions that they choose to look for in their observations. Such bias will not be conscious, but Huber argues that they are inevitable. As a result, the symbolic interactionist position that "truth is the emerging consensus of the participants in the interacting situation" (p. 276) will be self-limited by the social biases of the researcher who decides what will be observed.

Blumer (1973) counters Huber's argument by stating, first that all sociological methodologies are subject to the researcher bias that Huber describes, and second, that she is incorrect in her assertion that symbolic interactionists rely exclusively on observation over theory in conducting research. No researcher begins with a clean or blank slate. Every investigation is naturally grounded in prior theory,

particularly functionalist theory about how individuals and groups interact. In order to observe a group or interaction, the sociologist must first define the group as a group, or the interaction as an interaction. There is room for theoretical bias here from any discipline. "The likelihood of introducing unwitting bias is much less when the problem is developed through a close, flexible and reflective examination of the empirical world than when the problem is formed by using a model not derived through such intimate, empirical examination." (p. 798) Close scrutiny by the observer will control for any introduced bias. Huber (1973b) counter-argues that "if the scrutiny is not sufficiently intense and flexible, the researcher presumably remains captive to prior images." (p. 800)

The continuing debate illustrates a touch point between functionalism as a grounding discipline, and interactionism as an exploratory or emergent discipline. In applying symbolic analysis to the information industry described below, the existing base of functionalist knowledge regarding the industry and its interactions will serve as Huber's grounding theory, allowing for Blumer's observational methods to seek and identify the role of meanings in the expected and observed interactions.

Chapter 4

Change in Information Technology

This section introduces the information technology industry and explores aspects of the software engineering profession within that industry in order to identify potential applications of the distinction drawn above between structural-functionalist and symbolic-interactionist models of social interaction and meaning.

Software Engineering

For most of the history of the software engineering profession, the role of creating and implementing software systems for organizations was viewed as an organizational function. Humphrey (1989) describes the maturing of an organization's software management processes over time; emphasizing the almost interchangeability of individual software engineers through an emphasis on organizational standards and management reviews. This model attributed the quality of any resulting software systems to the structure and control of the centralized and usually hierarchical organization models that managed these resources. With computer resources in most organizations dominated by large centralized mainframe computers, the parallel centralized structure for the software engineering function seemed natural to many.

With the advent and explosion of personal computer technologies in the 1980's, the computer and information resources managed by these centralized hierarchies became decentralized. Frictions ensured between the centrally managed software engineers and their widely distributed user and computer environments. Humphrey (1995) describes the pendulum swing within the industry from centralized hierarchical organizations toward independent autonomous individual software engineers. These engineers still worked for hierarchical organizations, but their work and status came to be

managed at the individual level. Quality became the responsibility of individual engineers and tools and techniques were developed for these purposes.

By the 1990's, particularly with the advent of the Internet in the mid-90's, computer resources became increasingly interconnected and interdependent; and the software being engineered for these environments was growing more and more complex. Humphrey (1999) describes the rise of team and virtual thinking associated with organizational models in information technology. Making individuals the focal-point of quality methods ignored too many realities of how software systems are developed and implemented. Large teams of multi-disciplined professionals became the dominant model for information technology groups.

The history of information technology began with large centralized hierarchies of technology, shifted toward autonomous individual personal computers, and evolved into the wide and complex networks that exist today. The original hierarchical network of workstations all connected to an individual central mainframe gave way to the web of interconnected computers where no central owner or controller exists.

In a manner consistent with a modern structural-functionalist perspective, the software engineering organizations that have tried to keep pace with this evolution of technology by adopting organizational styles that mimic the technologies being implemented. Large centralized information technology organizations have given way to webs of dynamic, virtual, self-organizing teams that run autonomously throughout their parent organizations.

Industry Standards

As these organizational structures have tried to keep pace with this evolution, the industry has also tried to keep pace with the technology by developing and imposing standards that enforce stable views of how technologies should be developed and used.

Technical Standards

More than 250 software engineering standards have been developed by more than 50 international, national, professional, and industry standards organizations in the last two decades. (Harauz, 1999, p. 51) A key player in the technical standards arena has been the IEEE Software Engineering Standards Committee that develops and promulgates a large variety of technical standards that cover the majority of knowledge domains of interest to the professional software engineer. (Moore, 1998)

Management Standards

In addition to the many technical engineering standards that have been promulgated, the same period has seen the definition and growth of general quality standards that greatly affect the economies and industries that set the context for a large portion of the software engineering community. Quality management in the United States has been dominated for the last fifteen years by the Malcolm Baldrige National Quality Award, an industry-focused general quality management model design to be used to increase the general quality capability of American companies. (National Institute of Standards and Technology, 2001)

Also during this same period, the international quality management arena has been dominated by the ISO 9000 series quality management standards that define a quality management system against which organizations in many industries can measure themselves and be audited for compliance.

(American National Standards Institute, 1991) Within the broader ISO 9000 movement, international standard ISO 9000-3 offers specific implementation guidance for adapting the most comprehensive of the ISO 9000 standards - ISO 9001 – to the software industry. (American National Standards Institute, 1994)

Technical Management Standards

Throughout the 1990's, the Software Engineering Institute at Carnegie Mellon University worked to develop a series of models that would mediate between the specific and technical software engineering standards that were emerging and the higher-level and broader quality management models. The earliest work explored the order in which technical disciplines should be improved to optimize the behaviors of the overall management structure in information technology. Weber, Paulk, Wise, and Withey (1991) had learned that the order in which individual engineering and management processes were improved was a key determinant of long-term success. They defined a series of capability maturity levels through which an information technology function must develop to eventually be able to achieve some of the organizational qualities called for in the broader general quality models. Their justification for building a model that included five plateaus was built on the Quality Management Process Maturity Grid that had been pioneered by Crosby (1979).

Standards Harmonization

There have been efforts to harmonize, or reconcile, these multiple levels of standards and models. I explored how to reconcile the Balridge model with some of the technical standards for data engineering. (Biehl, 1993) Radice (1995) developed detail guidelines for using the ISO 9000 series quality standards in the software industry. All three levels were integrated into a single working model by Tingey (1997).

SEI Capability Maturity Models

Within this backdrop of technical and management standards, the Capability Maturity Models (CMMs) developed by the Software Engineering Institute have become the key focus of software engineering improvement practice among software engineering and information technology organizations worldwide. The three primary CMMs that have been developed since 1989 (Table 1) have grown from an initial focus exclusively on software to a very broad systemic model that incorporates hardware and communication technical disciplines along with the human factors associated with changes in the modern team and virtual workplaces.

Table 1 – SEI Capability Maturity Models

CMM	Scope
Software	Definition, creation, and implementation of software systems.
Systems Engineering	Definition, creation, and implementation of engineering systems; including hardware, software, communications, and other related components.
Integrated Process Management	Definition, creation, and implementation of engineered human-machine systems with emphasis on integration of human factor and psychosocial process factors into system characteristics.

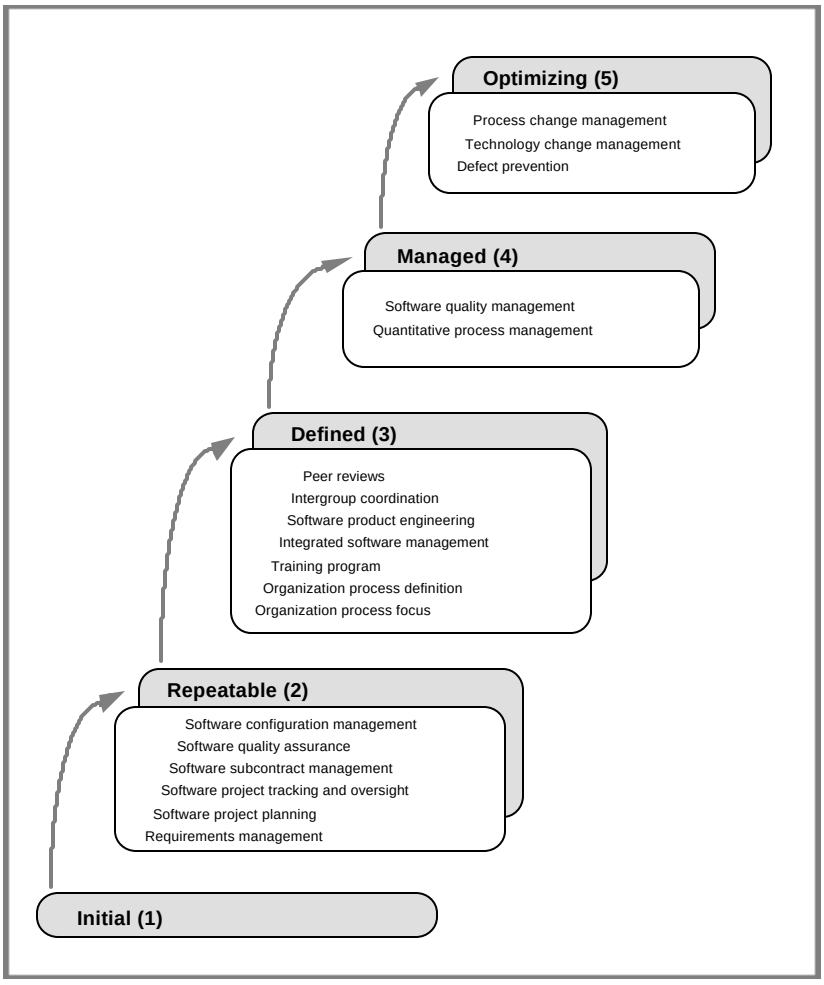
Note:

As these models have been developed, they have met with increased resistance and difficulty in being deployed throughout the industry. Organizations that struggled to implement the simpler narrower models, rarely moved on to adopting wide and broader models.

Capability Maturity Model for Software

The initial CMM from the SEI was the Capability Maturity Model for Software. (Software Engineering Institute; 1993) It defined a five-layered maturity model that could be used by any information technology or software engineering organization to define and improve their process maturity through an extensive and long-term improvement program that would bring the organization up through the five levels in sequence. Each level defined specific activities, known as Key Practice Areas (KPAs), that needed to be improved in order to move to the next level. (see Figure 1) The model was an important step in helping the software engineering community to know which of the hundreds of available technical and management standards should be attacked first, and which could be deferred until a more appropriate time as defined by the five levels of the SW-CMM.

Figure 1 - Capability Maturity Model for Software



Note: Adapted from Weber, Paulk, Wise, & Withey; 1991. Used by permission.

Use of the SW-CMM to improve practices generally results in quality and productivity improvement. McConnell (1999) reports that organizations making the necessary investments saw productivity improvements of 35% per year, and project schedule improvements of 19%. Quality also improved when viewed through the 39% reduction in reported defects for systems already completed. (p. 69) Use of the CMM proved useful to certain organizations that had what it took to make such an implementation. Exactly what those factors were remained elusive to software practitioners.

Early adopters of the SW-CMM found that its use improved their overall software development process capability as reported in the literature, but that, as the organization improved its software

practices, other arenas in the software and information technology area remained problems. There remained a need for a broader improvement model that encompassed more than just the software development aspects of systems creation and implementation.

Systems Engineering Capability Maturity Model

The broader aspects needed in an improvement model involved aspects of information technology systems creation that went beyond software. In all but the most trivial information systems, the interaction of the software with its surrounding environment of hardware, data, and communications produces more complexity and quality problems than any particular aspect of the software itself. The SW-CMM maximizes an organizations ability to implement software, but left these broader issues unaddressed.

In response, the SEI and a consortium of industry representatives who had made the greatest strides in implementing the SW-CMM, developed and published the Systems Engineering Capability Maturity Model [SE-CMM]. (Software Engineering Institute; 1996) It added activities to the software maturity model that enhanced organizational capabilities related to vendor and hardware management, problem identification and monitoring, and additional factors related to integration and management of complex system components and subsystems.

The SE-CMM altered the architecture of CMMs as it had been during the development and subsequent enhancement of the SW-CMM. Where the SW-CMM arranged key activities into five different levels that needed to be implemented in the correct order to achieve each level of process maturity and capability, the SE-CMM changed to a continuous model where all activities applied to all five capability levels. In the continuous model, all activities were relavent at all times, but different specific activities were identified as more or less important at each of the five levels. The difference

between the original staged architecture and the emerging continuous architecture was highly conceptual and created problems in implementation and adaptation among many organizations trying to use both SW-CMM and SE-CMM models.

Integrated Product Development CMM

As the expanded systems model began to be used by those organizations with enough software maturity to take advantage of its added features, addition new omissions became apparent. The systems engineering activities included in the SE-CMM were those highly technical disciplines carried out by engineers on projects. Still omitted were other less-technical disciplines that were involved in any real-world product or system development. These disciplines included marketing, sales, customer service and support, and a host of management and financial specialties. The development of the Integrated Product Development Capability Maturity Model [IPD-CMM] (Software Engineering Institute, 1998) worked to address these omissions by adding the disciplines encountered in managing multi-disciplinary teams and cross-functional projects to the technical engineering disciplines already defined in previous CMMs. The IPD-CMM was built using the same continuous architecture that had been introduced in the SE-CMM.

By the late 1990's, the evolution of CMMs within the Software Engineering Institute and the broader software engineering marketplace looked complete. There now existed CMMs for the narrow view of software only, the medium view that added systems thinking to software, and the broadest view that included people as cross-functional contributors to the development of software and systems.

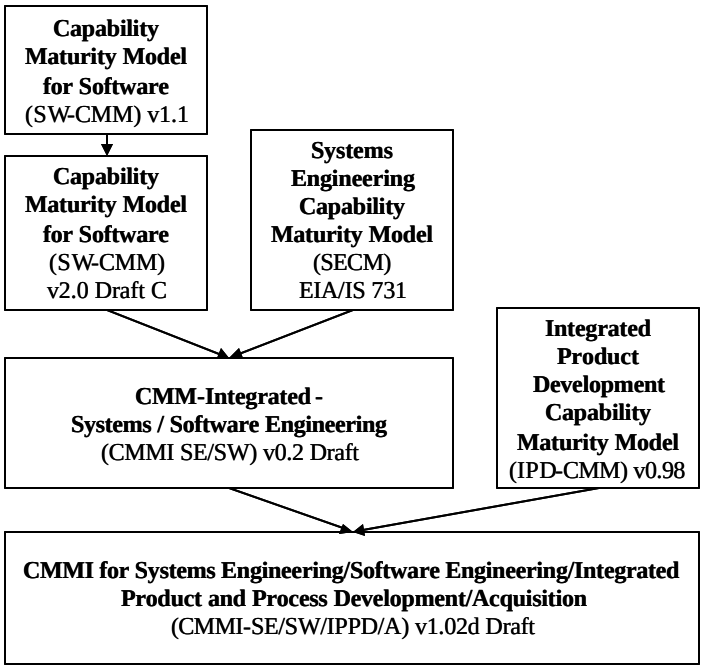
Capability Maturity Model – Integrated (CMMI)

By the middle and late 1990's there were many organizations achieving various levels of success with each of the initial three major CMMs. A growing problem was that, while the three models were

mutually supportive and had much overlapping content, tey remain as three distinct models. Software engineering organizations that hoped to improve all of their software, systems, and people processes needed to adopt and use all three models at the same time. There existed no unified model that could be used to implement all of the necessary key practices. The problem of multiple models was made worse by the architectural differences between the staged SW-CMM model and the continuous SE-CMM and IPD-CMM models.

At the end of the 1990's, the SEI announced a new Integrated Capability Maturity Model [CMMI} that would combined all of the features of the three previous models into a single working improvement model. It was developed as both a Staged CMMI (Software Engineering Institute, 1999a) and Continuous CMMI (Software Engineering Institute, 1999b). Figure 2 illustrates the evolution and flow of these various CMMs.

Figure 2 – Evolution of the Integrated-CMM



Note:

The CMMI model has run into significant market resistance since its introduction in 1999, particularly from organizations who have been struggling for years to implement the first three models and resist the requirement that they rebuild their improvement programs around the new integrated model. Resistance has been so fierce that the implementation, originally scheduled for late 2000, has been delayed until at least the middle of 2002.

Each of the Capability Maturity Models has run into trouble being implemented. When viewed from a structural-functionalist paradigm, each has offered increasingly complete and comprehensive coverage of all of the key processes necessary to build and run a successful software engineering environment. And yet, they have not be readily accepted and used by the industry. The application component of this KAM explores some of the non-structural issues that night be contributing to these weak or resisted implementation.

Professionalism in Software Engineering

The CMMs are highly functional-structuralist in orientation. Organizational structures and work group definitions and functional assignments are laid out in great detail for implementation. Little to nothing is said about the perception and belief systems of the professionals that make up the organizations that adopt these models. If the application component is to look at meaning and communication as interactionist perspectives on CMM implementation, one must first look at what is meant by software engineering professional in the context of CMM implementation.

Maister (1997) brings a number of perspectives to thinking about professionals, from the behavioral aspects of professionalism to the knowledge-based aspects of what a professional should be able to deliver. It is in both of these senses that Maister states that “the opposite of the word

professional is not unprofessional, but rather technician." (p. 16) Maister looks at this gap and finds passion and caring among the characteristics expected of the professional, yet not penalized when absent from the technician. The professional feels a commitment to quality, a pride in the work, and a commitment to the client that is over and above those needed to fill a job. A true professional exhibits behaviors that make these beliefs and commitments visible to all around. "Professional is not a label you give yourself - it's a description you hope others will apply to you." (p. 17)

Maister asserts that "while others may seek *jobs*, the defining characteristic of professionals is that they seek *careers*." (p. 26, emphasis in original) He challenges professionals to seek perspectives from which work life can be viewed as challenging, even fun. "All it takes to find the fun is a little energy, ambition, drive, and enthusiasm. So scarce are these characteristics that they are today the dominant competitive advantage for both individual professionals and firms." (p. 29)

Meister offers a powerful two-dimensional model for identifying what kind of practice a professional desires; either as tool for planning a new practice direction, or as a diagnostic tool for understanding the dimensions of an existing practice. The model is based on a medical analogy of pharmacist, nurse, psychotherapist, and brain surgeon. The two dimensions include the degree of customization necessary to solve client problems and the degree of client contact required in the delivery of services.

The model doesn't exclude working day-to-day in all four quadrants implied by these two dimensions; rather, it offers a framework for understanding and evaluating the various work accomplished by individuals and groups. The role of pharmacist involves execution of standard processes with a low level of client contact needed. The role of nurse emphasizes standardized processes that require a high degree of client interaction. The role of psychotherapist deals with

customized processes emphasizing diagnosis using a high degree of client contact. The role of brain surgeon emphasizes customized diagnosis with a low level of client involvement. Different professionals will place their own activities into differing quadrants; and evaluate the fit against their own career aspirations and skill capacities.

Many software engineering professionals, wanting to be recognized as brain surgeons, find themselves often dispensing the prescriptions. Maister's emphasis is to move through the model by continually developing and enhancing skills while also continually adapting to the needs of clients; developing better and more enjoyable practices through continuous improvement and growth.

Such continuous change is specifically addressed by Hohmann (1997), who sees software professionals as problem solvers, and endeavors to explain the behaviors of, and relationships among, such individuals as best represented using a sociological model that includes both problem-solving behaviors as well as social and goal-oriented beliefs and values. When integrated, these perspectives offer a mental model for continuously improving the efficiency and effectiveness of the methods practiced by such professionals.

Hohmann offers his Structure-Process-Outcome (SPO) Framework as a tool for integrating these methodological and cognitive perspectives. Process brings together methods and cognitive models. The richer and more experienced the cognitive models of the professional, the less formalized and intricate the associated methods need be. Outcomes represent the end results of processes, and vary in form and content based on the needs of the processes and experiences of the professional. Structure provides the form and content for defining the processes and outcomes and the interactions among them.

Hohmann describes the problem-solving process of the software professional as a need to understand the problem to be solved, designing a solution to that problem, and then verifying the solution once it has been implemented. While the SPO Framework applies as a model to each of these perspectives of the professional's task, Hohmann pays particular attention to the need to design solutions. It is here that he identifies the greatest challenge to understanding the work of the software engineer, "the greatest mysteries regarding just what and when these designs emerge from the minds of each professional." (p. 18) Hohmann's central theme is that "increasing your understanding of your own mental processes will enable you to become a more effective developer." (p. 10)

Experienced professionals "have larger and more sophisticated cognitive libraries" (p. 19) at their disposal for identifying and solving problems. They can use these libraries in order to perform better leveling; "the shifting among different levels of generality or abstraction during problem solving." (p. 18) Their increased domain experience allows them to quickly determine what aspects of each problem exhibit the greatest complexity, bringing their strongest cognitive capabilities to bear on the most needed parts of each problem. Experienced professionals "not only know to solve the 'hard part' of the problem first, but they also correctly identify what the 'hard part' is." (p. 21) Less experienced novices tend to focus on the wrong aspects of many problems, in the wrong order, creating very messy and less efficient paths through their solution spaces.

Hohmann describes a journey; how engineers can move along the path from novice to experienced professional. "A professional cares deeply about their client and works to ensure his or her needs are fairly and accurately met - whoever the client may be." (p. 32) He describes the responsibility of professionals to both lead and follow, to manage and improve themselves and their relationships with others, and to conduct their work with competence and integrity.

Gerald Weinberg (1988) offers insights on the software engineering professional that fits with the models offered by Maister and Hohmann. He begins with his own definition of professional as someone "having great skill or experience in a particular field of activity." (p. 16) Like Hohmann, Weinberg describes "an exercise in self-examination for the professional." (p. 20)

Looking at the various technical skills and paradigms required of experienced programmers, Weinberg challenges professionals (as if anticipating Hohmann's focus on the professional's cognitive library) to explore and understand their meta-paradigms. Weinberg analyzes several meta-paradigms of the successful professional. Meta-paradigms include such skills as the use of analogy, tracing and retracing one's own thought processes, induction from special cases to general rules, deliberately widening one's circle of intellectual associates, actively seeking to know what others have done and using such work as a starting point, and attempting to communicate with others using paradigms in order to clarify one's own thoughts.

He offers his own personal reflection in the form of ten personal principles, his “Precious Programming Principles”, (p. 40) the tenth of which states that "every programmer has at least ten personal principles, but only one programmer in ten thousand is willing to take the time to write down even one." (p. 42) Weinberg challenges professionals to reflect on, and share, their own meta-paradigms and principles.

Any paid programmer will use the technical skills and paradigms of the field, but only professionals will develop and consistently use such meta-capabilities. They provide and strengthen the structural component of Hohmann's SPO Framework. Weinberg challenges his readers to "spend a part of your working day examining and refining your own methods." In the process, each will uncover their own secrets that will make the pursuit of their profession more successful.

"There's much the professions could learn from one another, if only they shared their secrets." (p. 50) Weinberg draws analogies with other professions as a way of exploring that which makes programming a profession. Citing two apparently contradictory paradigms of medicine to not give up treatment too soon and to not stick with one treatment too long, Weinberg observes that "the secret of their secrets lies not in the secrets themselves, but in knowing when to apply each one. Maybe it's not *know-how* … but 'know-when'." (p. 51, emphasis in original) Even Maister's technicians can know the secrets, but only experienced professionals with Hohmann's extensive cognitive libraries will appreciate when to use them.

Weinberg laments the fact that there are many programmers working for pay who should not be referred to as professionals. "The point is not merely that there are people out there passing as professional programmers who shame us all, but that *few managers have any way of telling if they're talking to one of them or one of us*." (p. 53, emphasis in original) "Somehow, if programming is ever to be treated as a profession, the public - and programmers themselves - will have to be educated." (p. 53) Rocchi (2000) describes competent software engineers as possessing both technical knowledge and knowledge of culture to support the correct and proper use of that technical knowledge. (p. 3)

Schön (1986) describes a problem statement that seems familiar to many software engineering professionals: In any profession, there are many manageable problems that lend themselves to solution using the theories and techniques readily available within the knowledge base of the profession. These "high ground" (p. 3) problems stand in stark contrast to Schön's "swampy lowland" (p. 3) of messy problems that defy technical solution using the current knowledge of the profession. "The irony of this situation is that the problems of the high ground tend to be relatively unimportant to individuals or society

at large, however great their technical interest may be, while in the swamp lie the problems of greatest human concern." (p. 3)

Schön looks at traditional professional education, of using theory to teach practice, and turns it around. By analyzing effective practice, more effective theories of professional action become possible. This isn't accomplished by formal research studies into the actions of professionals, but by the day-to-day reflection on practice carried out by every professional. Anticipating Weinberg, Schön declares that a profession can be strengthened by encouraging and institutionalizing such broad-based self-reflection. Curry and Wergin (1993) also address the role education, and a defined body of knowledge, play in developing and sustaining the credibility of any individual working within any specific profession. They explore various aspects of the building of professional status and credibility through education and reflection.

Typical actions by professionals can be characterized as knowing-in-action. Practitioners exhibit their ability to perform within their profession every day. Schön uses the term *professional artistry* to describe the occurrences where competent practitioners exhibit extraordinary competence that is unique in uncertain circumstances. “What is striking about both kinds of competence is that they do not depend on our being able to describe what we know how to do or even to entertain in conscious thought the knowledge our actions reveal.” (p. 22)

Professional knowledge is embedded in the action and need not be articulated or explicated each time it is applied by the professional. In fact, attempts to describe such knowledge actually turn it into something else. “Our descriptions of knowing-in-action are always *constructions*. They are attempts to put into explicit, symbolic form a kind of intelligence that begins by being tacit and

spontaneous. Our descriptions are conjectures that need to be tested against observations of their originals." [p. 25, author's emphasis]

Instead of attempting to understand someone else's knowing-in-action, Schön emphasizes our own ability to look at our own professional actions. "It is sometimes possible, by observing and reflecting on our actions, to make a description of the tacit knowing implicit in them." Such reflection can lead to the development of personal principles as described by Weinberg, and meta-paradigms as described by Hohmann.

Schön takes an additional step beyond simple self-observation. He looks at those special situations with unknown or unusual circumstances during which our professional practice is extended into Schön's professional artistry. "All such experiences, pleasant and unpleasant, contain an element of *surprise*. Something fails to meet our expectations." (p. 26, emphasis in original) It is in these situations that our attention is triggered, and actions that usually remain hidden even from our own observation suddenly become available for reflection. "We may reflect *on* action, thinking back on what we have done in order to discover how our knowing-in-action may have contributed to an unexpected outcome." (p. 26, emphasis in original)

What Schön describes is a need to teach practitioners to seek such opportunities for reflection in real-time so that they can continually improve everyday activities and practices. "In an *action-present* - a period of time, variable with the context, during which we can still make a difference to the situation at hand - our thinking serves to reshape what we are doing while we are doing it. I shall say, in cases like this, that we reflect-*in*-action." (p. 26, emphasis in original) Such reflection-in-action builds our mental models and improves our professional practice.

Schön's key theme is that knowing-in-action can be influenced in real-time by effective reflection-in-action. Enabling continual and ongoing improvement, a hallmark of professional practice, requires teaching professionals to conduct their practices in an action-present during which they bring reflection to bear during each action taken and decision made. Reflective practice enables professionals to find their own versions of Weinberg's meta-paradigms and principles, allowing them to take Hohmann's "journey", enabling then to feel a pride in their work and offer their services to their peers that represent the hallmarks of Maister's "true professionalism."

Chapter 5

Change Framework for Information Technology

This section explores some of the characteristics of social thinking drawn from postmodernism, particularly attributes associated with symbolic-interactionism, and identifies potential instances where they might map to, and mediate, change situations in the information technology industry and software engineering profession outlined above.

Dimensions

The symbolic interactionist model, particularly with Goffman's dramaturgical extensions, helps define several dimensions against which features and characteristics can be varied in order to observe the efficacy of shifting from a functional toward an interactionist perspective. These features and characteristics will serve as the seeds for some of the change-related instruments experimented with in the application component. The symbolic interactionist framework suggests that these dimensions will mediate the perceptions of professionals involved with the structural functionalist CMM models presented here in this depth component.

Identity

The social act of interactionism involves individuals each mediating their own participation in every interaction through the filter of their own identify; their beliefs, norms, and perceptions of their own relationships. Following Mead's concept of 'generalized other,' Johansson (2000) sees the self identity as an object that is continuously being scrutinized by the self. Individuals reflect on themselves according to their own history of previous interactions, and the ways in which they perceive themselves successfully and unsuccessfully interacting with others. Our on-going present is a constant reinvention of our pasts through reflection. (p. 51-3)

Beliefs

Bar-Tal (2000) describes the "epistemic" (p. 48) function fulfilled by beliefs in social groups. They serve to enlighten members of those groups in the thinking and elements of the group's values that help provide cohesion that is important to group stability and on-going longevity. "Societal beliefs change through a process of negotiation." (p. 71) In order for social groups to discuss and modify their collective and individual beliefs, there must be venues in which such beliefs become externalized and visible, subject to discussion and further transmission.

Norms

Social acts occur in response to stimuli in the environment. Interactionism views individual beliefs and goals as mediating such acts through affects on the thinking and modifying opinions of actors involved in these acts. Anderson (2000) describes norms as special cases of beliefs and sentiments that affect the perspectives of individuals. Norms provide context for organizational standards of expected behavior, and how such behaviors relate to organizational goals. (p. 35) Because norms can be unwritten, indeed unstated and unconscious, their effects on organizational and individual behaviors can be unpredictable and surprising. Making norms public and visible should allow them to become part of the interactionist field that impacts behavior. Shared norms can reveal underlying disagreements about behaviors in the environment.

Anderson (2000) draws attention to Parson' contention that norms are continuously referenced during courses of action. (p. 82) Controls around norms are necessarily imperfect because there is always some variation and divergence of attitudes and interpretations of norms. What will be reasonable and acceptable will always be a band of norms lying between the most extreme positive values and the lowest boundary of unacceptable behavior. The width of the band, and the actual

positions of the extremes are a function of defining different cultures. Structural-functionalists will note the boundaries, and interactionists will focus on the width and position of the band; and the fact that reasonable actors within each culture or organization will occupy different positions within that band.

Relationships

Individuals interact according to their perception of the relationships that exist between them. The type of relationship can alter behaviors during interactions that might carry out quite differently under differing relationship conditions. Anderson (2000) describes levels or types of relationships as ranging from ad hoc to mandated. Ad hoc relationships, perhaps not applicable to relationships within organizations, show no pattern and serve only accidental purposes. Mandated relationships are imposed from without, and serve the purposes of the individual or group that mandates the relationship. Between these extremes, Anderson describes exchange relationships that are based on mutual need and voluntary activity. (p. 62-3) Anderson's model predicts that implementing a CMM in a software engineering organization will achieve different results depending upon whether the prescribed relationships are simply made mandatory, or exchange relationships are created by identifying and communicating goals and objectives that will result in mutual and voluntary cooperation.

Conclusion

The way professionals define their identify, their beliefs, their norms, and their relationships greatly influences how they will interact with other professionals and with employers in the workplace. Software professionals in the United States face implementation of structural models embodied in the Software Engineering institute CMM models; models that dictate highly structured and functional duties and responsibilities. Interaction among actors is defined in these models in highly structured and predefined roles. Successful implementation will depend on the extent to which actors see their own self

views aligned with the expectations of the structured models. Interactionist theory presumes that people will mediate their own interactions if given the opportunity to create meaningful communication of meaning. The instruments developed and presented in the application component attempt to provide such opportunity.

References

Allan, K.; & Turner, J. H. (2000). A formalization of postmodern theory. *Sociological Perspectives, 43*(3). 363-385.

American National Standards Institute (1994). *Quality systems: Model for quality assurance in design, development, production, installation, and servicing*. ANSI Standard Q9001-1994.

American National Standards Institute (1991). *Quality management and quality assurance standards: Guidelines for the application of ANSI-Q9001 to the development, supply, and maintenance of software*. ANSI Standard Q9000-3-1991.

Anderson, R. C. (2000). *The interorganizational community.* Lewiston, UK: The Edwin Mellen Press.

Antonio, R. J. (2000). After postmodernism: Reactionary tribalism. *American Journal of Sociology, 106*(2): July:40-87.

Antonio, R. J. (1998). Mapping postmodern social theory. (Chapter 1) In Sica, A. (Ed.). *What is social theory? The philosophical debates*. Malden, MA: Blackwell.

Baert, P. (1998). *Social theory in the twentieth century*. Washington Square, NY: NYU Press.

Bar-Tal, D. (2000). *Shared beliefs in a society: Social psychological analysis*. Thousand Oaks, CA: Sage Publications.

Best, S.; & Kellner, D. (1997). *The postmodern turn*. New York: Guilford Press.

Biehl, R. E. (1993). Data administration and the Malcolm Baldrige National Quality Award. In von Halle, B. (Ed.). *Handbook of data management*. New York: Auerbach.

Blumer, H. (1973). A note on symbolic interactionism. *American Sociological Review, 38*(6). December: 797-798.

Burrell, G.; & Morgan, G. (1979). *Sociological paradigms and organisational analysis: Elements of the sociology of corporate life.* London: Heinemann.

Calhoun, C. (1995). *Critical social theory: Culture, history, and the challenge of difference*. Oxford: Blackwell.

Castells, M. (2000). Materials for an exploratory theory of the network society. *British Journal of Sociology, 51*(1). January/March: 5-24.

Chan, A. (2000). Redirecting critique in postmodern organization studies: The perspective of Foucault. *Organization Studies, 21*(6). 1059-1075.

Charon, J. M. (1995). *Symbolic interactionism: An introduction, and interpretation, and integration*. Fifth edition. Englewood Cliffs, NJ: Prentice Hall.

Charmaz, K. (2000). Looking backward, moving forward: Expanding sociological horizons in the twenty-first century. *Sociological Perspectives, 43*(4). 529-547.

Cosgriff, P. W. (2000). The right things for the right reasons: Lessons learned achieving CMM level 5. *Journal of the Quality Assurance Institute, 14*(2). 26-32.

Crosby, P. B. (1979). *Quality is free*. New York: McGraw-Hill.

Gemes, K. (2001). Postmodernism's use and abuse of Nietzsche. *Philosophy and Phenomenological Research, 62*(2). March: 337-360.

Guimaraes, T.; Yoon, V. Y.; & Clevenson, A. (2001). Exploring some determinants of ES quality. *Quality Management Journal, 8*(1). 23-33.

Harauz, J. (1999a). International trends in software engineering and quality system standards: Ontario Hydro's perspective, Part 1. *Software Quality Professional, 1*(2). 51-58.

Harauz, J. (1999b). International trends in software engineering and quality system standards: Ontario Hydro's perspective, Part 2. *Software Quality Professional, 1*(3). 30-36.

Hassan, I. (1987). *The postmodern turn: Essays in postmodern theory and culture*. Cincinnati, OH: Ohio State University Press.

Hewitt, J. P. (1994). *Self and society: A symbolic interactionist social psychology*. Boston: Allyn and Bacon.

Hohmann, L. (1997). *Journey of the software professional: A sociology of software development*. Englewood Cliffs, NJ: Prentice-Hall PTR.

Huber, J. (1973a). Symbolic interaction as a pragmatic perspective: The bias of emergent theory. *American Sociological Review, 38*(2). April: 274-284.

Huber, J. (1973b). But who will scrutinize the scrutinizers? *American Sociological Review, 38*(6). December: 798-800.

Humphrey, W. S. (1989). *Managing the software process*. Reading, MA: Addison Wesley.

Humphrey, W. S. (1995). *A discipline for software engineering*. Reading, MA: Addison Wesley.

Humphrey, W. S. (1999). *Introduction to the team software process*. Reading, MA: Addison Wesley.

Jalote, P. (2001). The success of the SPI efforts in India. *Software Quality Professional, 3*(2). 36-40.

Johansson, T. (2000). *Social psychology and modernity.* Buckingham, UK: Open University Press.

Kontoghiorghes, C.; & Dembeck, D. (2001). Prioritizing quality management and sociotechnical variables in terms of quality performance. *Quality Management Journal, 8*(3). 36-48.

Lyon, D. (1994). *Postmodernity.* Minneapolis, MN: University of Minnesota Press.

Lyotard, J. F. (1979). *The postmodern condition: A report on knowledge*. Minneapolis, MN: University of Minnesota Press.

Lyotard, J. F. (1993). *The postmodern explained: Correspondence 1982-1985*. Minneapolis, MN: University of Minnesota Press.

Maister, D. H. (1997). *True professionalism: The courage to care about your people, your clients, and your career*. New York: Free Press.

McConnell, S. (1999). *After the gold rush: Creating a true profession of software engineering*. Redmond, WA: Microsoft Press.

Mead, G. H. (1932). *The philosophy of the act*. Chicago: Open Court Publications.

Mead, G. H. (1938). *The philosophy of the present*. Chicago: University of Chicago Press.

Moore, J. W. (1998). *Software engineering standards: A user's roadmap*. Los Alamitos, CA: IEEE Computer Society.

National Institute of Standards and Technology (2001). *Baldrige national quality program: 2001 criteria for performance excellence*. Gaithersburg, MD: U.S. Department of Commerce.

Paulk, M. C. (1999). Using the software CMM with good judgment. *Software Quality Professional, 1*(3). 19-29.

Pescosolido, B. A.; & Rubin, B. A. (2000). The web of group affiliations revisited: Social life, postmodernism, and sociology. *American Sociological Review, 65* February: 52-76.

Poloma, M. M. (1979). *Contemporary sociological theory*. New York: Macmillan Publishing.

Radice, R. A. (1995). *ISO 9001 interpreted for software organizations*. Andover, MA: Paradoxicon.

Ritzer, G. (1991). *Contemporary sociological theory*. Third edition. New York: McGraw-Hill.

Ritzer, G. (1997). *Postmodern social theory*. New York: McGraw-Hill.

Rocchi, P. (2000) *Technology + culture = software*. Amsterdam: IOS Press.

Rose, A. M. (Ed.) (1962). *Human behavior and social processes*. Boston: Houghton-Mifflin.

Ryan, J. (2000). The internet challenge to the quality profession. *Software Quality Professional, 2*(2). 54-60.

Schiralli, M. (1999). *Constructive postmodernism: Toward renewal in cultural and literary studies*. Westport, CT: Bergin & Garvey.

Schön, D. A. (1986). *Educating the Reflective Practitioner*. San Francisco, CA: Jossey-Bass.

Seidman, S. (1994). *The postmodern turn: New perspectives on social theory*. Cambridge: Cambridge University Press.

Smart, B. (1993). *Postmodernity.* London: Routledge.

Software Engineering Institute (1993). *Key practices of the capability maturity model, Version 1.1*. Technical Report CMU/SEI-93-TR-25. Pittsburgh, PA: Carnegie Mellon University.

Software Engineering Institute (1996). *Software acquisition capability maturity model (SA-CMM) Version 1.01*. Technical Report CMU/SEI-96-TR-020. Pittsburgh, PA: Carnegie Mellon University.

Software Engineering Institute (1999a). *Capability maturity model – integrated – systems/software engineering: Staged representation*. Version 0.2. CMM Integration Project. Pittsburgh, PA: Carnegie Mellon University.

Software Engineering Institute (1999b). *Capability maturity model – integrated – systems/software engineering: Continuous representation*. Version 0.2. CMM Integration Project. Pittsburgh, PA: Carnegie Mellon University.

Tingey, M. O. (1997). *Comparing ISO 9000, Malcolm Baldrige, and the SEI CMM for Software: A reference and selection guide*. Upper Saddle River, NJ: Prentice Hall PTR.

Weber, C.V.; Paulk, M. C.; Wise, C. J.; & Withey, J. V. (1991, August). *Key practices of the capability maturity model*, Carnegie Mellon University: Software Engineering Institute. (Report # CMU/SEI-91-TR-25, ADA240604)

Weimer, A. L.; & Munyan, R. J. (1999). Recipe for a successful system: Human elements in system development. *Software Quality Professional, 1*(4). 22-30.

Weinberg, G. M. (1988). *Understanding the professional programmer*. New York: Dorset House.

Bibliography

Buckley, W. (1967). *Sociology and modern systems theory*. Englewood Cliffs, NJ: Prentice Hall.

Cusick, J. (2001). Software engineering: Future or oxymoron? *Software Quality Professional, 3*(3) 40-48.

Mead, G. H. (1982). *The individual and the social self: Unpublished work of George Herbert Mead*. D. L. Miller, Ed. Chicago: University of Chicago Press.

Merton, R. K. (1996). *On social structure and science*. Chicago, University of Chicago Press.

Michael, M. (2000). *Reconnecting culture, technology, and nature: From society to heterogeneity.* London: Routledge.

Parsons, T. (1954). *Essays in sociological theory*. Revised edition. New York: Free Press.

Tester. K. (1993). *The life and times of post-modernity.* London: Routledge.

Tönnies, F. (1965). *Community and society.* New York: Harper Torchbooks.

Turner, B. S. (1994). *Orientalism, postmodernism and globalism*. London: Routledge.

Usrey, M. W.; & Dooley, K. J. (1998). The measurement of customer attitudes concerning software quality. *Quality Management Journal, 5*(2). 42-57.

Usrey, M. W.; & Dooley, K. J. (1996). The dimensions of software quality. *Quality Management Journal, 3*(2). 67-86.

Wiegers, Karl E. (1996). *Creating a software engineering culture*. New York: Dorset.

WALDEN UNIVERSITY

Core Knowledge Area Module 1:

Principles of Societal Development

AMDS 8132 - Professional Practice and Organizational Change

Student: Richard E. Biehl
Program: Applied Management & Decision Sciences
Specialization: Leadership and Organizational Change
Assessor: Dr. Gary Gemmill

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Chapter 1

Introduction

Overview

The breadth component of this KAM outlined the many social theoretical systems that are associated with both functionalist and non-functionalist social theories. The depth component delved further into the specifics of the functionalist perspective, focusing on postmodern thinking regarding social function and organization. It particularly explored symbolic-interactionist theories and how they might be applicable to change processes in the information technology industry and software engineering profession.

In this application component, I apply the functional and structural characteristics explored in the depth component to a collection of actual industry-focused change needs in my industry: information technology. I was interested to see how such theories explored in the breadth and depth components could be used to explain and inform actual industry experiences in applying such change models.

Objectives

Specific application component objectives are:

1. Develop a planning instrument for implementing social change in an organization that uses the framework developed in the depth component.

2. Test and evaluate that instrument in an actual organization undergoing social change using the models discussed in the depth component.

3. Present the tested framework instrument at a professional conference and publish the resulting instrument and presentation in its conference proceedings.

Variance from Plan

Circumstances during the researching and writing of this KAM forced me to alter my original plan somewhat. The objectives, as originally written, anticipated using my findings in the depth component to develop one or more instruments that might embody and use a few of the insights gained in the depth component. These instruments were to be presented at a QAI conference and then tested in a volunteer client site. In actual execution of this plan, ideas for instruments came about during the research, but did not crystallize in time for the planned April presentation. Instead, a focus group was used at the conference to solidify the ideas for instruments, and then the instruments themselves were finalized after the conference. Trial use was still conducted based on these instruments. The change meant that the broader conference participants were able to contribute to my thinking about what instruments would be useful, and what those instrument should look like. I believe that the change improved the quality of the outcome.

Chapter 2

Conference Presentations

To facilitate the identification, creation, and trail use of the instruments in this application component, I arranged to be a speaker at the annual national conference of the Quality Assurance Institute (QAI) in Orlando, Florida. QAI is a professional membership organization concentrating on software quality assurance; the principle field involved in the implementation of the various SEI CMMs discussed in the depth component.

Integrated-CMM Session

On Wednesday, April 25, 2001, I gave a break-out session presentation on the Integrated Capability Maturity Model introduced in the depth component. (Biehl, 2001; see Exhibit, p. 25) Seventy-eight people attended the 75-minute session. The nominal focus of the presentation was to discuss the evolution of SEI CMM models and discuss strategies for their implementation given that so many organizations were struggling to still implement the earliest CMM for Software. By a simple show of hands in the session, all attendees were at Software CMM Level 3 or lower, and none were yet attempting to implement any of the other CMMs. Many expressed concerns that their organizations would be unable to make the necessary transition to the newly integrated models before the SEI dropped support for the original model.

A secondary purpose of the presentation was to set the stage for a discussion focus group to be convened the next day. Throughout the presentation, and during the discussion period that followed, I continually asked attendees to think about reasons why they were still struggling to implement the Software CMM even after years of attempts and management acceptance. Themes recurred

throughout individual comments that echoed back to many of the interactionist themes developed in the depth component.

While everyone in the room believed in the model represented in the CMM, and felt that their home organizations also believed in the models; all acknowledged that implementation required more than a technical belief in the model's properties. Individual professionals in various organizations more or less accepted the models based on their own experienced and beliefs about software engineering, project management, and their organization's commitment to change. These beliefs are not specifically addressed in the CMM model. The CMMs don't address individuals as people, only software engineering functions as part of the structure to be dealt with. The approach is highly structural-functional. I invited interested attendees to continue the discuss of the role of beliefs, meanings, and feelings in a discussion group to be convened the next day.

Discussion & Focus Group

I had arranged to use one of the conference break-out rooms to conduct a discussion forum on this topic right after lunch on Thursday, April 26, 2001. One hundred and sixty-five people attended. What had been planned as a focus group was quickly converted to a panel discussion with me serving as the panel, and the managing director of QAI serving as an ad hoc moderator.

The original intention of the focus group had been to discuss meanings and beliefs held by software engineering professionals across the full spectrum of process maturities represented by the capability maturity models. However, once the session started it became readily apparent that most attendees were from organizations stalled at implementing the first improvement effort under the Software CMM, from Level 1 to Level 2. A few in the audience stated that they were working toward Level 3 already; but even they expressed concerns about their already completed Level 2 initiatives.

This sample – admittedly self-selected – was interesting because my presentation the previous day had been built on my experience that organizations typically stall after having achieved Level 3 compliance. I had referred to the phenomenon as the Level 3 Plateau. This group was expressing an even more severe problem; of how to even begin the complicated journey implied by the CMM. The depth component laid out the collection of CMMs available for organizational improvement, involving hundreds of steps of increasing complexity. The literature reports (Jalote, 2000; Caputo, 1998) that implementations across many industries has been slow; but this group was reporting a core difficulty in even getting started.

The resulting session was focused almost exclusively on SW-CMM Level 2. The specific Key Practice Areas included in the SW-CMM Level 2 criteria are listed in Table 1.

Table 1 – Software CMM Level 2 KPAs

Key Practice Area
Requirements Management
Project Planning
Project Tracking and Control
Subcontract Management
Quality Assurance
Configuration Management

Note:

The discussion revolved around trying to discuss and understand why such a comprehensive model should be so difficult to implement in real organizations. Everyone seemed agreed that what the CMM called for in terms of organizational compliance were the 'right' things to require for improvement. Most examples discussed revolved around underlying assumptions about behavior and

control that many perceived to be embedded in the model. The model actually says nothing about what kind of detail controls are required, only that controls should be implemented. And yet, participants consistently voiced concerns that engineers within their organizations would resist the model on the grounds that it didn't, or couldn't, be fit into the idiosyncrasies of their actual workplace.

Also addressed in many comments were the level of academic language used in the model's definition, and the level of potential bureaucracy implied by many of the procedural statements. Software engineers see themselves as engineers, not managers. Many would likely resent much of what they were called upon to do to properly control and manage their own work.

The session carried on for approximately an hour before the agenda called for participants to move on to their next session. About thirty or forty people lingered in the discussion for about twenty more minutes.

Selection of Instruments

The output of the discussion converged around three candidates for instruments that would be designed to probe tacit knowledge and unconscious beliefs about the SW-CMM Level 2 KPAs:

1. The organization's beliefs about rigorous and controlled management is an important precursor to any attempt to implement the SW-CMM KPAs related to project planning, tracking, and control. If an organization is not committed to the underlying principles underlying the CMM in these areas, then no implementation can be successful. This issue was labeled 'Project Management Readiness' on the session flip-charts.

2. While discussing the various KPAs for management and control of projects, contractors, and products; a distinction rose among group participants between actual disciplined management versus academic or tedious over administration. There was a general fear expressed across the group

that the CMM topics related to management often simply resulted in increased administration of their activities. Such administration most often surfaced as a need for more and longer meetings among project teams, teams and suppliers, and teams and customers. Strong consensus emerged that excessive meetings were often burying CMM-targeted projects and that this often resulted in project inefficiencies that forced a by-passing of CMM-related process controls. Dissatisfaction with meetings was regarded as a major stumbling block to implementation of the CMM. This issue was labeled 'Meeting Satisfaction' on the session flip-charts.

3. Many among the group took issue with the very first KPA in the CMM: Requirements Management. An overt focus on managing requirements was causing, many participants claimed, projects to alter their requirements definitions to adhere to the academic-like requirements structure required by the various international standards for requirements definition. This change was resulting in overly sterilized requirements that adhered to the standards, but that actually did a poor job of meeting the team's needs and of properly identifying the customer's problems. Managing the statements was becoming more important that satisfying the customer. How the customer felt about the requirements was not a factor considered in the CMM KPA for requirements. This issue was labeled 'Requirements Satisfaction' on the session flip-charts.

These three ideas would be carried forward to instrument development and trial.

Chapter 3

Developed Instruments

Notes from the focus group discussion of the three tentatively proposed instruments were used to create the assessment instruments presented in this section.

Project Management Readiness

The instrument designed to measure the readiness of an organization to implement the project management controls in the SW-CMM consisted of ten assessment items that would be rated by respondents. A 10-point scale was chosen, where a "1" would indicate strong disagreement and "10" would indicate strong agreement with the scored assessment statement. Items were developed to address many of the underlying assumptions of the CMM-mandated practices (see Table 2) In addition to scoring individual items using the 10-point scale, respondents were also asked to indicate which four of the criteria they considered most important; with important to be considered independently from whether they agreed with the statement or not.

Members of the focus group discussion had expressed concern that stakeholders in their organizations were failing to implement the required practices, not because they disagreed with them directly, but because they didn't fully understand or agree with the underlying assumptions that were resulting in the selected direction. Under different assumptions, perhaps the CMM criteria might be better implemented using different practices. Paulk (1999) argued for increased rationality and reasonableness in adapting these standards to organizational settings; believing that the belief systems and experiences of individuals should play a greater part in their interpretation.

Other areas addressed in the instrument included the CMM directive that minimal training should be required for many improvement efforts, and that industry standards should be used to fill in engineering knowledge gaps built into the CMM itself.

Table 2 – Project Management Readiness Items

Assessment Statement
1. The department should enforce stricter standards on information technology project managers.
2. It is important that the status of all information technology projects be more visible to management.
3. There should be less variation in the approach and deliverables used by different information technology business projects.
4. Our information technology project environment needs more structure and consistency.
5. Better controlled processes will help projects work with outside contractors more effectively.
6. Our organization is committed to using the expanded capabilities of a set of project management guidelines when they are ready.
7. Individual projects would be more effective if we shared project deliverables and working papers more.
8. Identifying and tracking changes is the most important success factor for our information technology project management program.
9. Implementing enhanced project management will require only minimal training of project managers and team members.
10. Where feasible, enhanced project management should move us toward compliance with available industry standards for projects.

Note:

The resulting instrument was packaged as a single-page survey that could be completed by managers in planning or status meetings, or team members at any time. If used over an extended time, it

could be used to illustrate longitudinal change in the measured perceptions. In the short-term, it was hoped that individual low scores could be used to continue team discussion until workable solutions or alternatives could be uncovered.

Meeting Satisfaction

An instrument to measure meeting satisfaction was built in the same manner; 10-point agreement scale and top-4 important items. The items defined are provided in Table 3.

Table 3 – Meeting Satisfaction Items

Assessment Statement
1. Adequate preparation resources were provided to me prior to the meeting.
2. The objectives of the meeting were clear.
3. The roles of all meeting attendees were clear.
4. The deliverables or action items to come out of the meeting were clear.
5. The meeting started and ended on time and generally followed the agenda.
6. All meeting attendees were appropriately prepared.
7. Time was used wisely in the meeting.
8. The meeting achieved its objectives.
9. The meeting was necessary.
10. I needed to attend this meeting.

Note:

Participants in the focus group had commented frequently that traditional measures of meeting success (e.g. on time, 100% attending, minutes produced, action items defined) only increased the likelihood that meetings would be bureaucratic and overly administered. Alternatively, participants expressed an interest in seeing meetings use time wisely, and in making sure that the right stakeholders

were in attendance. Many seemed bothered by the low level of priority for preparation and follow-through that their organizations gave to meetings; even though most people spent most of their time in them.

The instrument developed was an attempt to give a voice to these underlying concerns in a way that would highlight the appropriate issues if they actually occurred in the environment.

Requirements Definition

An instrument to measure requirements satisfaction was built in the same manner; 10-point agreement scale and top-4 important items. The items defined are provided in Table 4.

Table 4 – Requirements Satisfaction Items

Assessment Statement
1. All items that are needed for the specification of the requirements of the solution to the problem have been identified.
2. Each item in the requirements specifications is free from error in terms of both what it says and how it says it.
3. Each item is exact and not vague, with a single interpretation and meaning that is understood and is easy to read.
4. No item in the requirements specifications conflicts with another item in the specification.
5. Each item in the requirements specifications is pertinent to the problem and its solution.
6. During development and acceptance, it will be possible to determine whether the item in the specification has been satisfied.
7. Each item in the specifications can be implemented with the techniques, tools, resources, and personnel that are available.
8. The specification contains statements that must be satisfied by the solution, and are not obscured by proposed solutions.
9. The requirements statements are expressed in such a way that each item can be changed without excessive impact on other items.
10. I am satisfied with the requirements specification, within the limitations of its current scope and version.

Note:

Focus group participants expressed strong feelings regarding requirements definition within and across the software engineering process. Most acknowledged that their organizations were producing the requisite requirements specification documents on their projects, but also felt that these documents were not having their intended impact on project quality and productivity.

The instrument in this category was designed to identify and highlight the types of subjective impressions individuals were reporting against their own organization's requirements results but that

were not being picked up and made visible by the criteria for successful requirements documented in the SW-CMM and related IEEE and ISO requirements standards.

Impacts Expected of Instruments

These instruments were designed and intended to draw out aspects of organizational process capability pointed to by postmodernist thinking related to interactionism and the role that individuals' beliefs and meanings of their work. Allan and Turner (2000) had noted that reflexive thinking through fixed criteria could offer stabilizing points in the changing relationship between professionals and their employers. Giving a voice to the frustrations and feelings of professionals could limit the negative impacts of the functionalist structures that create processes often perceived as bureaucratic.

Castells (2000) described these impacts – positive or negative – as driving an organization into disequilibria, only to re-crystallize relationships and interactions at some new point. These instruments might influence relationships in a favorable direction, causing new norms to emerge more closely aligned with the desires and beliefs of the individuals involved with these processes. Harauz (1999a, 1999b) argued that an over-reliance on standards (the structuralist view) should give way to the active perceptions and beliefs of professionals as mediating agents in the day-to-day operation of organizations (the interactionist view).

A common element among the three instruments was that the criteria measured emphasized softer rules and limits than the more fixed-term details associated with the existing processes prior to their introduction. Chan (2000) described such interactionist thinking as leading to increased professional buy-in and satisfaction; and antithesis of the kinds of reactions often experienced when management simply imposes structure on processes and human interaction. Chan argued, using Foucault's contrast between freedom and resistance, that common professional goals could emerge

from the interaction of individual meanings as each professional becomes more self-conscious of their own working environment. These instruments are designed specifically to evoke such thinking. Charmaz (2000) described these common goals as an emergent and strengthened center as marginalized views were incorporated into the broader agreeable consensus among individuals interacting in the working system.

The importance of people and the meaning that they attribute to their work and environment was Cosgriff's (2000) position when he argued that changing people's attitudes was an expected reaction to building an improvement philosophy into individual self-image. These instruments were designed to get respondents to reflect on aspects of their work that important to them; particularly in the way their work was conducted. Such thinking should lead to implicit improvement as individuals model better behaviors in response to the reflection caused by the use of these instruments. Cosgriff argued that such use of meaning and common sense would outweigh other existing political and bureaucratic inhibitions otherwise built into the environmental structures.

Guimaraes, Yoon, and Clevenson (2001) looked for new meanings to arise from an exploration of the tacit knowledge held by individuals within a work environment. They called for observational techniques to be used to draw out and solidify that tacit knowledge. They wrote of interviews, direct observations, and personal journaling as observation techniques; but these instruments, as surveys, serve their intended purpose. The ratings that individuals give to the various dimensions measured in each instrument, particularly the weighting of top-4 criteria, can bring emotional and tacit reactions among respondents to the surface.

Since each of these instruments is intended, not just to measure, but drive change in the working environment by modeling preferred behaviors and priorities, they should increase what Kontoghiorghes

and Dembeck (2001) described as each respondent's "psychological ownership" (p. 39) of any resulting shift or change. They argued that satisfaction with internal processes – the key dimension measured by these instruments – could be the primary useful indicator and predictor of organizational success. Such ownership aligns with Weimer and Munyan's (1999) position of giving these human interaction factors greater consideration as an organization works to change individuals psychologically and professionally.

In all, the literature supports an argument that the measurement of beliefs and feelings in these instruments is likely to drive actual change as self-reflection gives way to newly modeled behaviors and interactions. Pescosolido and Rubin (2000) describe these interactions as intelligence being built into networking effects. As self-organizing systems, professional relationships and actions are likely to stabilize into new patterns driven by the meanings and values associated with the factors measured in these instruments, each in their respective disciplines. Trial use would attempt to confirm these projections.

Chapter 4

Trial Use

This section discusses my field trials of the developed instruments.

Limitations of the Trial

This was not a scientific study. No formal research design or review took place that would be required to identify or mitigate any inherent biases or inconsistencies in the development and deployment of these instruments. Generally the instruments tested resulted in consistent reports from similar users over the trial period, increasing confidence in the reliability of the instruments. Also, individuals participating in trial tests expressed agreement that the instruments were well targeted in terms of defining metrics that addressed the qualitative dimensions being discussed, indicated good face validity.

Data was collected, and individuals participated, as part of on-going project management activities. Individuals were aware of the trial basis of the use of these instruments, but were not asked to consent to participation. All participants were basically self-selected volunteers, each having the option to not complete and turn in their instruments. All data collected was anecdotal, and no control groups were used to attempt to assure that these instruments were actually measuring what they were purported to measure. At best, these findings can be used to suggest areas for possible further research.

Selection of Trial Site

In seeking a trial site for testing these instruments, I limited my search to organizations that I knew were implementing the SEI SW-CMM model and were reported as stumbling or failing in their attempt to get past CMM Level 2 to try an assault on CMM Level 3. Such organizations would mimic the characteristics of my Orlando focus group that had identified the scope and criteria to be measured using these initial instruments.

I further limited my search to organizations that I had a current or past working relationship with in order to preclude an extensive startup period. I wanted to test my instruments during June 2001 and didn't want to lose time having to meet with and solicit participation from an organization that didn't already know me.

From among a few candidates, I chose the Specialty Chemicals Division of Honeywell International. I had helped the division in some of their earliest attempts at CMM implementation in 1996 and 1997, and still had many contacts there; although I wasn't working with them at the time. The pending merger with General Electric had put many of the projects that I would typically be associated with on hold; and the impending collapse of that merger was creating instability within the environment.

The Chief Information Officer for the division, who had been a technical manager during my previous tenure, saw the window of inactivity created by the merger as an opportunity to allow me to demonstrate and pilot my instruments with his project teams and direct reports. I coordinated my activities through his process improvement manager in Ohio; although the teams selected to participate were all in New Jersey.

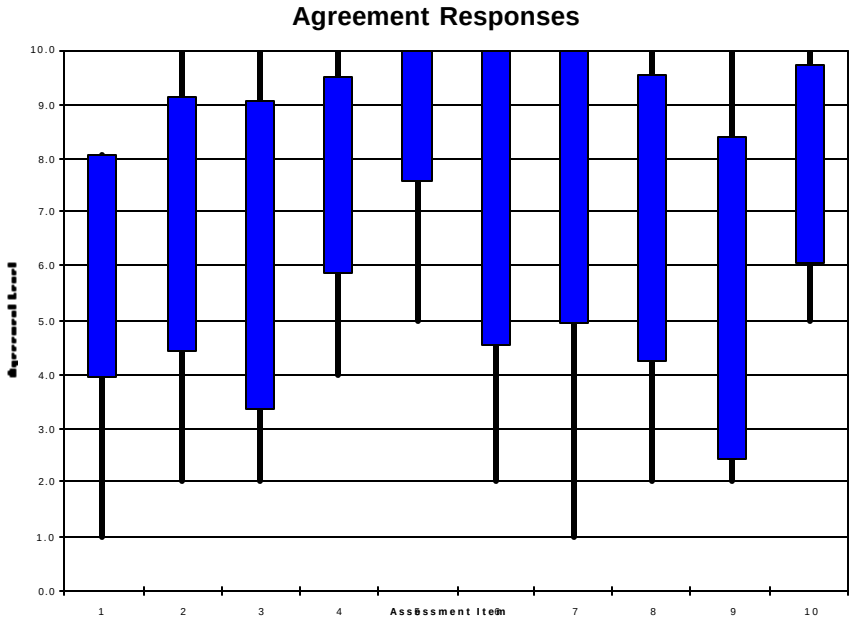
Management & Project Trials

During June and July 2001, project instruments were used in a variety of team meeting and project status settings. Details of internal Honeywell projects are proprietary, and so specific data are not reported here. However, examples of how data were tabulated and presented for discussion are included as Figure 1 and Figure 2.

When reviewing results of agreement or disagreement with each assessment statement, it was interesting to note the range of answers received within teams and meetings. Data quickly illuminated that individuals working in groups often had completely different perceptions of what was going on

within the same project or in the same group. While different items in different settings received high or low assessments, the lowest scorers never failed to trigger discussion and reflection among participants. Follow-up trials in the same settings one or two weeks later often found increased assessment scores for those items that had been the worst scorers during earlier trials.

Figure 1 – Sample Agreement Results

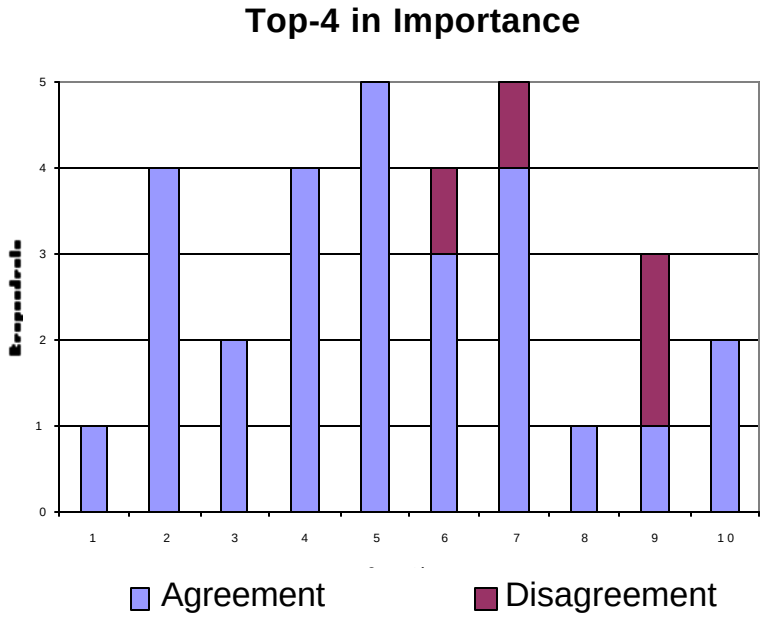


Note: Thin bars represent full range of responses. Thicker bars indicate range of responses within one standard deviation of the mean response.

In reviewing items that respondents felt were most important during these trials, it was interesting to note that there were almost always individuals within the group who rated statements they had strongly disagreed with as among the most important. This often occurred on items that the group as a whole didn't report as very important. These items sometimes were very sore issues for the respondents reporting them as important, and this attitude was often received with some surprise by

others in the group or team. Some of the most heated discussions during the trials were between people who had rated an item as most important but had completely differed in whether or not they agreed with the statement.

Figure 2 – Sample Importance Results



Note:

Discussion Outcomes

The important outcomes from each trial use were the discussions that were generated by the findings. Although not a scientific finding, these trials seem to confirm the friction observed in the breadth and depth components between modernist functionalism and postmodern interactionism. Given the opportunity to express their feelings and beliefs, participants enthusiastically worked to improve their own project situations in ways that they were unable or unwilling to approach using just the functional and structural framework of the SW-CMM. More surprising perhaps than this overt outcome was the simple enthusiasm that participants exhibited toward the entire process. It was as though they had never

been asked their opinions before. A wealth of latent and tacit knowledge simply overwhelmed the process once released. This anecdotally confirms Allan and Turner's (2000) suggestion that increased self-reflexive behaviors would naturally lead to positive improvements and change.

Chapter 5

Follow-up

The instruments developed in the application component are still in use within the trial site. Even after my testing was completed, the participants felt they were receiving enough value from their participation that they chose to adopt these three instruments as part of their on-going project management strategy. When the dust settles from the now-defunct GE merger, and the division again revisits their plans to work toward SEI CMM compliance, these instruments will become part of the formal process. I hope to have a hand in that work.

Likewise, the instruments were so successful at Honeywell that I have incorporated a version of them into my professional practice with all of my clients. The results and kudos I am receiving across those organizations roughly match those achieved during the trials at Honeywell. These instruments seem to have tapped a nerve within the engineering communities in these companies. I'm planning on publishing these results in the Quality Assurance Institute's journal next spring, and I hope to present them at a Software Engineering Conference within the next year.

References

Allan, K.; & Turner, J. H. (2000). A formalization of postmodern theory. *Sociological Perspectives, 43*(3). 363-385.

Antonio, R. J. (2000). After postmodernism: Reactionary tribalism. *American Journal of Sociology, 106*(2): July:40-87.

Biehl, R. E. (2001). CMMI: Adapting to SEI's new integrated CMM. In Quality Assurance Institute (2001). *International information technology quality conference: Effective methods for IT quality.* Conference proceedings. April 23-27, 2001. Orlando, Florida.

Calhoun, C. (1995). *Critical social theory: Culture, history, and the challenge of difference*. Oxford: Blackwell.

Caputo, K. (1998). *CMM implementation guide: Choreographing software process improvement*. Reading, MA: Addison Wesley Longman.

Castells, M. (2000). Materials for an exploratory theory of the network society. *British Journal of Sociology, 51*(1). January/March: 5-24.

Chan, A. (2000). Redirecting critique in postmodern organization studies: The perspective of Foucault. *Organization Studies, 21*(6). 1059-1075.

Charmaz, K. (2000). Looking backward, moving forward: Expanding sociological horizons in the twenty-first century. *Sociological Perspectives, 43*(4). 529-547.

Cosgriff, P. W. (2000). The right things for the right reasons: Lessons learned achieving CMM level 5. *Journal of the Quality Assurance Institute, 14*(2). 26-32.

Gemes, K. (2001). Postmodernism's use and abuse of Nietzsche. *Philosophy and Phenomenological Research, 62*(2). March: 337-360.

Guimaraes, T.; Yoon, V. Y.; & Clevenson, A. (2001). Exploring some determinants of ES quality. *Quality Management Journal, 8*(1). 23-33.

Harauz, J. (1999a). International trends in software engineering and quality system standards: Ontario Hydro's perspective, Part 1. *Software Quality Professional, 1*(2). 51-58.

Harauz, J. (1999b). International trends in software engineering and quality system standards: Ontario Hydro's perspective, Part 2. *Software Quality Professional, 1*(3). 30-36.

Hassan, I. (1987). *The postmodern turn: Essays in postmodern theory and culture*. Cincinnati, OH: Ohio State University Press.

Jalote, P. (2000). *CMM in practice: Processes for executing software projects at Infosys*. Reading, MA: Addison Wesley Longman.

Jalote, P. (2001). The success of the SPI efforts in India. *Software Quality Professional, 3*(2). 36-40.

Kontoghiorghes, C.; & Dembeck, D. (2001). Prioritizing quality management and sociotechnical variables in terms of quality performance. *Quality Management Journal, 8*(3). 36-48.

Paulk, M. C. (1999). Using the software CMM with good judgment. *Software Quality Professional, 1*(3). 19-29.

Pescosolido, B. A.; & Rubin, B. A. (2000). The web of group affiliations revisited: Social life, postmodernism, and sociology. *American Sociological Review, 65* February: 52-76.

Ryan, J. (2000). The internet challenge to the quality profession. *Software Quality Professional, 2*(2). 54-60.

Weimer, A. L.; & Munyan, R. J. (1999). Recipe for a successful system: Human elements in system development. *Software Quality Professional, 1*(4). 22-30.

Bibliography

Kotter, J. P. (1996). *Leading change*. Boston, MA: Harvard Business School Press.

Exhibit – QAI Conference Proceedings Handout

CMMI: Adapting to SEI's New Integrated CMM

Richard E. Biehl, CQA, CSQE
Data-Oriented Quality Solutions

What this session is *not* about….

- The history of CMMI and its evolution.
- The role of the SEI and its relationship to CMM users.
- The architecture or contents of the CMMI suite.
- The controversy over the use of such a flexible and broad model for contractual supplier assessments.

What this session *is* about ….

- Using the CMMI to drive continuous improvement.

Session Plan

- Describe the *SW-CMM Level 3 Plateau* that prevents many organizations from maximizing CMM-based benefits.
- Offer an alternative to higher levels of CMM-based capability that includes broadening the focus of processes targeted for improvement.
- Discuss conceptual issues involved in multiple-CMM improvement programs.
- Provide a *brief* overview of the CMMI, with specific comparisons to the SW-CMM v1.1 model.
- Recommend CMMI adoption strategies and actions.

CMMI isn't a *problem*, it's a *solution*.

The Problem

- CMMI offers a broad improvement model based on the older available CMMs.
- IT organizations are struggling with how to adapt to CMMI without sacrificing improvements and capabilities gained in the past.
- Users who have reached a plateau against one model, usually the CMM for Software at Level 3, wonder whether they should make the investment in adopting a new bigger model; afraid that they'll be starting over again.

The SW-CMM Level 3 Plateau

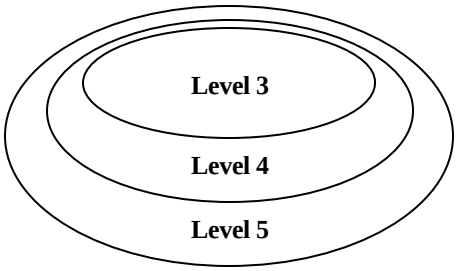
- Organizations that have successfully achieved SEI SW-CMM Level 3 are often confronted with the challenge of trying to determine what to do next.
- Often organizations simply challenge themselves to do more or better at their CMM Level 3 practices and are afraid to commit to CMM Level 4 goals.
- It's possible to challenge an organization at CMM Level 3 to move *across*, rather than *up*, the maturity continuum by working in one of the many other available CMMs.

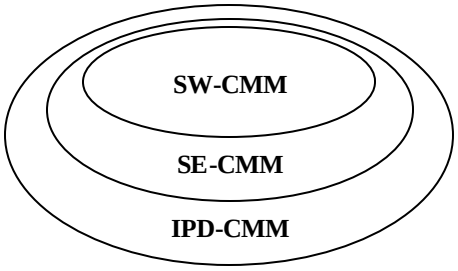
Plateau Alternatives

- Continue moving up toward CMM Level 4 and CMM Level 5 maturity levels.

or

- Broaden the scope of activities to include a wider array of process capability by adopting another CMM model.

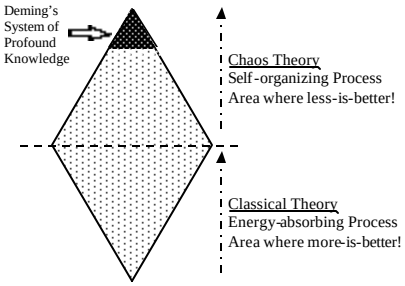


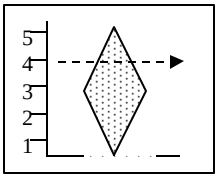


Broadening CMM Coverage

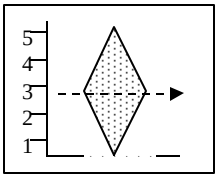
- An organization that assesses at Level 3 against the Software CMM will usually self-assess significantly lower against the SE-CMM or IPD-CMM, at least initially.
- This gap creates the necessary tension for the organization to challenge itself to improve, without the need to set CMM Level 4 or Level 5 goals for itself.
- It's a *breadth* focus to continuing improvement as an alternative to the *depth* focus of attaining Level 4 on the Software CMM alone.
- It addresses the common concern that CMM Level 3 organizations typically still have significant problems at their system boundaries that aren't adequately addressed by concentrating on Level 4 improvements.

Paradigm Change in Process Thinking

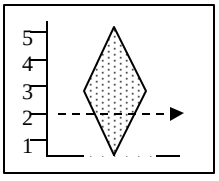




Expect improvements to decrease mass, and increase elegance. Need for less compliance checking as allowance is made for more self-direction.

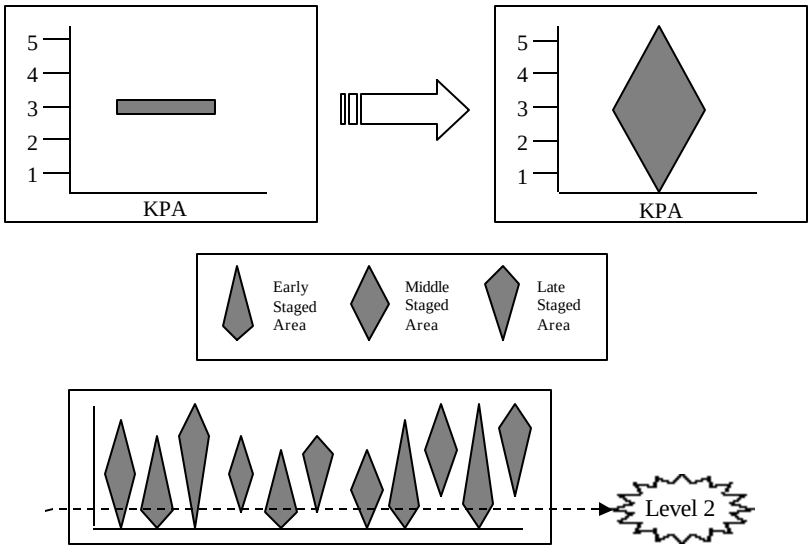


Key turning point for process improvement!

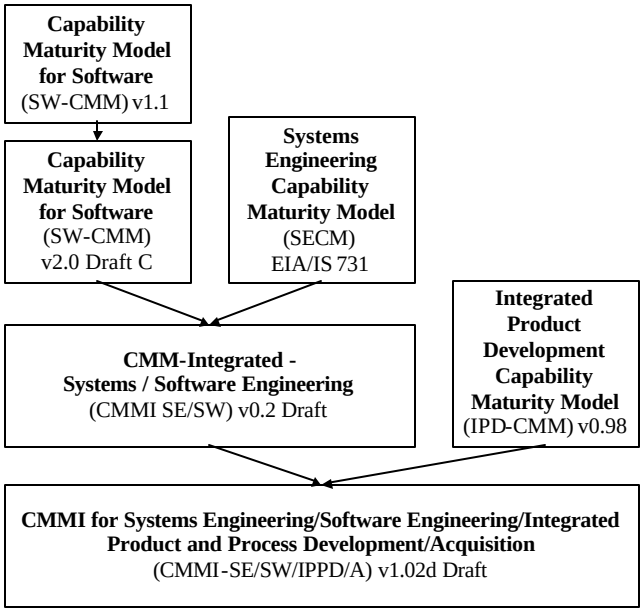


Expect improvements to expand and increase the process mass. Need for more tools, training, and support for successful deployment.

Staged-to-Continuous Thinking



CMMI Source Documents



CMMI Staged Model

Managed (Level 2)

- ***Requirements Management***
- ***Project Planning***
- ***Project Monitoring and Control***
- ***Supplier Selection and Monitoring***
- Measurement and Analysis
- ***Process & Product Quality Assurance***
- ***Configuration Management***

Quantitatively Managed (Level 4)

- Organizational Process Performance
- Quantitative Project Management
- Quantitative Supplier Management

Optimizing (Level 5)

- Organizational Innovation and Deployment
- Causal Analysis and Resolution

Defined (Level 3)

- Requirements Development
- **Technical Solution**
- **Product Integration**
- **Verification**
- Validation
- **Organizational Process Focus**
- **Organizational Process Definition**
- **Organizational Training**
- Integrated Project Management
- Integrated Supplier Management
- Risk Management
- **Integrated Teaming**
- Decision Analysis and Resolution
- Organizational Environment for Integration

CMMI Continuous Model

Process Management

- **Organizational Process Focus**
- **Organizational Process Definition**
- **Organizational Training**
- Organizational Process Performance
- Organizational Innovation and Deployment

Project Management

- ***Project Planning***
- ***Project Monitoring and Control***
- Integrated Project Management
- Risk Management
- **Integrated Teaming**
- Quantitative Project Management

Engineering

- ***Requirements Management***
- Requirements Development
- **Technical Solution**
- **Product Integration**
- **Verification**
- Validation

Support

- ***Configuration Management***
- ***Process & Product Quality Assurance***
- Measurement and Analysis
- Decision Analysis and Resolution
- Organizational Environment for Integration
- Causal Analysis and Resolution

Acquisition

- ***Supplier Selection and Monitoring***
- Integrated Supplier Management
- Quantitative Supplier Management

Recommended Order for Adoption

First Year

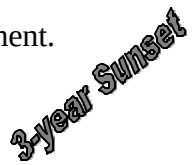
- Emphasize maintaining current Level 3 practices.
- Initiate *Measurement & Analysis* practice development.
- Rebuild Level 2 practices to include other CMMI extensions to Level 2 process areas.

Second Year

- Rebuild Level 3 practices to include CMMI extensions to process areas that overlap SW-CMM.
- Self-assess against the entire CMMI model.

On-going

- Prioritize process areas for continuing deployment.
  - Emphasize old SE-CMM process areas first.
  - Follow-on with old IPD-CMM process areas.



Further Recommendations

- Plan to use *both* the continuous and staged models.
  - Maximize continuous capability profile. [Micro]
  - Emphasize staged maturity level for comparisons. [Macro]
- Broaden process sponsorship and stakeholders.
  - CMMI impacts broader range of functions and processes.
  - Software leadership is only *part* of the sponsorship now.
- Place *heavy* emphasis on education and training.
  - CMMI is a magnitude larger than SW-CMM.
  - Paradigm shift requires greater self-direction.

Recap & Close

- The plateau effect at CMM Level 3 was a problem long before CMMI was initiated.
- The adoption of other non-software CMMs has been a significant problem because of architectural incompatibilities and terminology differences.
- The development of the CMMI has largely solved the problems of architecture and language.
- The broader CMMI model offers a broader array of improvement options for those organizations ready to accept the challenge of adoption and transition.