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The Implications of the Organizational Development and Change Supply Chain for ODC as an Academic Discipline

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ABSTRACT

This article presents and expands upon the idea of an "ODC Supply Chain" which Dominck Volini of Right Management Consultants and the University of Pennsylvania presented during an Organizational Development and Change Management (ODC) Conference break out session. The article explains Volini's flowchart as a sequence of value adding activities which form a network of participants surrounding an academic ODC program. It also examines the economic and scholarly value exchanges and relationships that would occur around an academic ODC nucleus. The article also presents three academic analogies –- engineering, medicine, and economics -- to provide a range of reference cases paralleling, to varying degrees, the possible future development of ODC as an academic discipline. The variables and issues surfaced by the three reference case analogies are examined for similarities, differences and then used to postulate implications for the future development of ODC as an academic field in the context of the supply chain model.

Dominick Volini's ODC Supply Chain

Dominick Volini, of Right Management Consultants drew the diagram in Figure 1 below to explain the current imbalances in the OD system which flows from University through to Organizations and Society. A break-out-session discussion between Mr. Volini and Rosa Colon of Bristol-Meyers Squibb fleshed out a "contract" as well as some working linkages which connect the academic OD field with the broader society which provides resources for continued research, development and progress on important organizational problems.

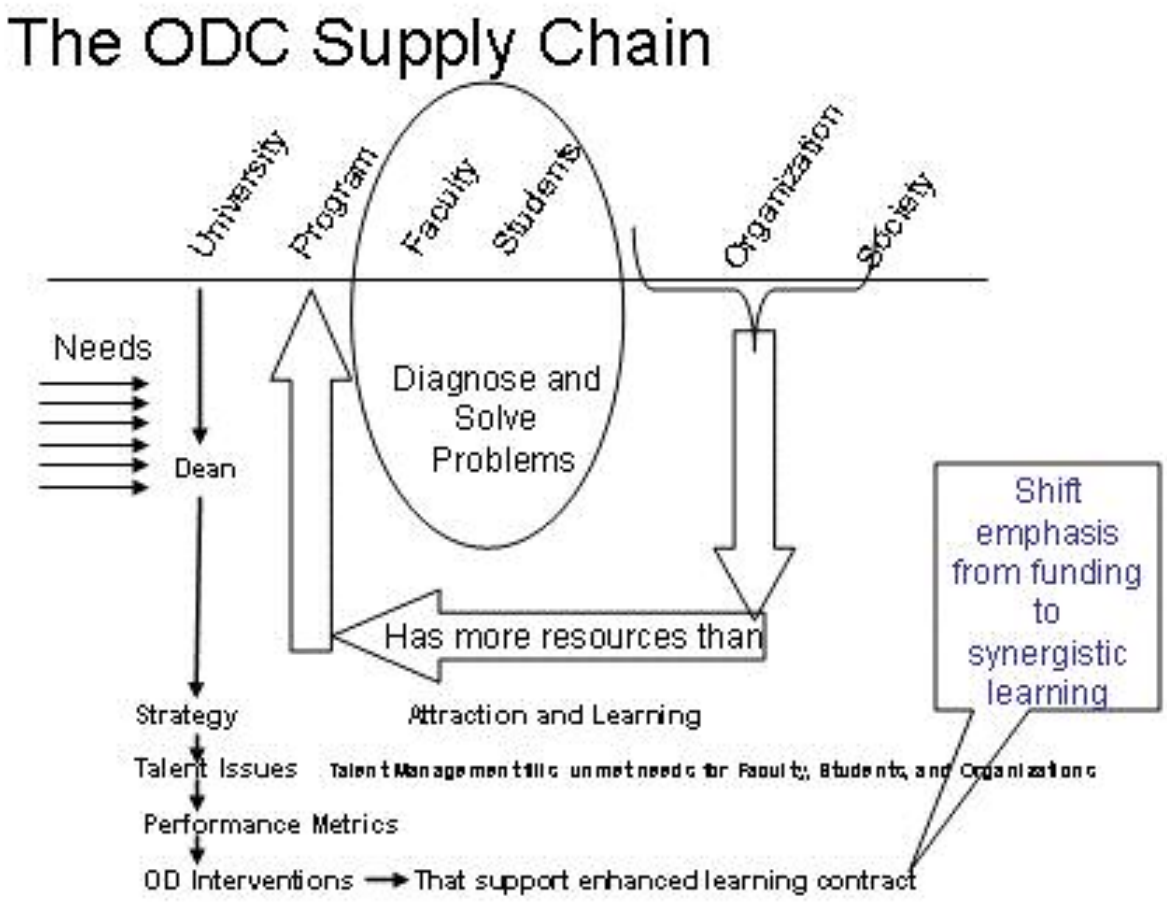

Figure 1 - Volini's Supply Chain Flowchart

The flowchart in Figure 1 shows how the University, an ODC program, Faculty, Students and surrounding organizations – businesses, non-profits and others -- work together as a sustainable system. Sustainability arises from flows of resources, talents and solved problems which generate value for society at the individual, organizational and regional economic levels. The diagram also suggests how key elements listed across the top ought to inter-relate. Volini's central concept is to shift the paradigm of organizational development and change management (ODC) from seeking funding by selling seats in academic degree and certification programs to one of creating value which in turn attracts resources and research opportunities.

Although Volini did not use the terms "lean process" or "pull supply chain system" in presenting his flowchart, implementing his sketch for a supply chain model would actually shift academic ODC from a push system, in which faculty teach students and push them out into a job market, to a lean, pull system where organizational and change management problems in surrounding organizations create a pull or demand for applied academic research and supervised student interventions under the guidance of faculty.

A pull system is demand driven. It supplies output exactly as demanded, when demanded and just in time without waste and delay. In this pull system, demand takes the form of real problems which attract interest of sponsoring organizations as well as from faculty and learners who wish to study and research theoretically sound solutions.

The objective of organizations attracted to the ODC supply chain is to solve pressing internal and external adjustment problems. Organizations have a sense of urgency because forces of change, such as government regulation, competitive shifts and challenges, technology changes, shifting customer demands, and the like often grow and impact performance. Organizations that fail to develop and adapt in the face of serious challenges may not survive independently. The problems that these organizations face may be thought of as learning and adaptation problems – they need to rethink their internal structures, processes and functions as environmental conditions change. This task requires them to develop effective solutions not just merely to do the same old thing with better efficiency. So, to adapt, such organizations must learn what to change, what to improve and what to develop, as well as how-to to put knowledge of change management and development to work at the right times and places.

The organizations that could benefit from engaging with a University based ODC program may not be aware of its availability and benefits. So the supply chain model assumes that the ODC program does some type of supplier development. This might take the form of dialog with between ODC faculty about organizational development and change challenges facing local firms. Executive seminars the program promotes could make senior executives in local firms aware of interventions capable of moving their organizations in the right direction. Such seminars would to link this understanding with the tactic of sponsoring selected employees in appropriate ODC degree or certification programs.

How-to organizational capability to develop and change appears to be tacit knowledge, (like bicycle riding). This knowledge is only possessed by those who have done that which they tacitly know how to do (ride a bicycle). They acquire it systemically in response to feedback from trial and error experience (simulated or real experience). The supply chain model assumes that at least a few organizations confronting their development and change challenges will ask internal resources, trusted and experienced change agents, to address them. Some of those resource people, or change agents as they are often referred to, will seek to upgrade their knowledge and skills in managing development and change.

By this and other means, the supply chain model assumes that academic organizational development programs can attract a significant number of mid-career students from organizations facing development and change challenges. These students are expected to continue as employees during their academic program, and to use what they are learning to accumulate feedback and build tacit knowledge. The model assumes that most of these students will seek education at the Master's level. As part of the supply chain, course work needs to be designed in ways that encourage such students to bring some of their home organization's most important and demanding challenges into the classroom. In the classroom, some subset of the "real world" challenges may provide "clinical" opportunities for those students to use knowledge they obtained through formal study and coursework. By sponsoring employees as ODC students, the sponsoring organization seeks to upgrade its capacity to adapt and develop and to benefit when these people apply their new knowledge and skill along with their existing understanding of the organization to produce unique solutions and create value for the sponsoring organization.

The objective of faculty in an academic ODC center within the supply chain – this paper assumes that the academic center in organizational development consists of two faculty groups: full time faculty academicians and adjunct or part time faculty practitioners. Members of the full time faculty pursue some mix of teaching, academic or scientific research (perhaps through supervision of Ph D and MS theses) and publication that is appropriate given their home institution's faculty advancement framework. In some cases academic faculty may engage in fee-for-service research or consulting for clients. However, full time academics in an ODC program have, or should have, a demanding work load in keeping up with progress in their fields, doing their own original research and publishing while teaching. Some, (perhaps many) full time ODC academics will therefore lack sufficient months and years of field experience to acquire tacit knowledge sufficient to guide organizations through major development and change challenges they face.

The model assumes that scientific and academic research and publication is the main engine for creating and diffusing knowledge. The academic faculty meshes knowledge with learning by keeping courses up-to-date with theoretical or scientific knowledge as it is published in academic journals. In addition, they do their own research and publication. Full time academicians in such an ODC program also provide the overall theoretical perspective which ensures that student and practitioner efforts add up to a unified theoretical understanding of ODC. Finally, the academic faculty as a body ensure that courses and research programs have sufficient intellectual and academic rigor and integrity to enhance the reputation of the university and its ODC program.

The supply chain model only operates as a system if there is an unbroken chain of delivered value from each supplier link to its downstream customer link. Consequently, the second group, adjunct faculty practitioners, must work closely both with both full time academics and with well qualified Masters Degree candidates. The adjunct's role is to help convey the results of research and publication into student practice. Adjunct faculty in this supply chain model are like linking pins helping to mesh up-to-date academic scientific knowledge with solutions to problem situations and challenges that students import into their study programs from their home organizations. As faculty guide students to success in using their new knowledge of ODC learned in class those students create value back in their home organizations.

In parallel and in partnership with full time faculty, the adjunct faculty help student develop their own tacit knowledge and skills by acting as reflective practitioners. Teaching and mentoring students gives adjunct practitioner faculty opportunities to review their own field experience in the light of updated theoretical knowledge they gain by working with full time academic faculty colleagues (and with their students who are studying the theory in other courses).

Adjunct faculty should have a high level of interest, mastery and integrity, because in addition to guiding, coaching and mentoring students, they serve as professional role models for students. Such would be selected because of their academic training, record of research, preference for research-based interventions, and for their demonstrated ability to work with and learn from organizational change and development situations in practice.

The objective of the ODC program as an academic entity is basically to "do well by helping all concerned to do good." The ODC program must align student, faculty and university interests in a steady flow of intellectually developed graduates who in turn create a reliable flow of economic value to employers of those ODC graduates. In the supply chain model, a well-designed and managed ODC program excels when it helps organizations prosper by creating situations in which academic and

practitioner faculty, students and sponsoring organizations work as a system to achieve their individual objectives. ODC programs that succeed in delivering value to surrounding organizations thereby contribute to local and regional economic security and prosperity.

The supply of organizational problems is never ending. So ODC programs that turn out graduates who help keep their home organizations prosperous, generate both the means and the motivation for organizations that have benefited to sponsor future learners in the ODC program. Consequently, demand for learning should be steady. Second, applied research generates skills and tacit knowledge in the learners and researchers. This knowledge can be codified and used to expand the academic curriculum. Third, hands on involvement of full time academic and practitioner faculty in guiding degree candidates in their field work defends the academic program against competitors offering cheap, push-oriented distance learning programs.

The objective of the curriculum is to generate high value synthesis of theoretical knowledge and practical skill – Organizational development and change takes valid understanding of what works -- where, when, and why? The ODC curriculum must align and manage course work, and student field work assignments into broad research designs aimed at creating a flow of publishable discoveries in areas of faculty research interest. This is where the ODC supply chain model needs to depart somewhat from the typical academic research supply chain. Typically full time professors and Ph. D. candidates teach masters candidates and undergraduates, while the Ph.D. candidates and professors do the "real research." ODC is unlikely to develop rapidly following this model because of the nature of common organizational problems.

Organizational phenomena exist outside the academy and cannot be brought inside for academic study the way certain disciplines can bring a specimen or case study into the laboratory. Even case study methods are inadequate for a situation in which learning objectives are defined in terms of direct sensory input and tacit knowledge as well as theory. This departure from the strictly academic supply chain model creates a need for involving academic and practitioner faculty in designing the curriculum to build a research dimension into learning and teaching degree program.

In a value-stream oriented ODC system, some portion of the student learning experience should fit into an overall experimental design. If student projects fit a larger design based on theory, the results of many student projects can be analyzed for patterns, trends and anomalies. In this way, the instructional process can help add lessons and new theories to the base of ODC knowledge. Because organizations attracted to the ODC program have varying and often unique needs, there is a major need for research and analysis designs flexible enough to accommodate student and faculty needs and interests, yet statistically robust enough to allow synthesis of many small studies into larger discoveries and efforts to test theory. Faculty who subsequently synthesize student research into theoretical knowledge which is valid across many organizations can then published their findings to make them available to future students and researchers.

The objectives of Masters Degree students are to obtain University certification that they have mastered knowledge that enhance both their personal development and their future employment prospects. The students may not be fully aware of what they need to learn in order to achieve their real objectives. This is especially true in areas of practice where they may know what problems concern or interest them, but lack exposure to the literature of the field.

Assuming that such students strive to achieve their objectives through degree or certification programs, once they meet requirements, they obtain a credential certifying the graduate has mastered a body of

knowledge in accordance with standards and reputation of the institution granting the degree or certification.

Distance learning programs may develop a dominant economic advantage for delivering well codified declarative knowledge. However, an automated interaction between learners and codified lesson material is neither an efficient, nor effective way for learners to acquire tacit and procedural knowledge. Such knowledge must come from doing which might be done in an ODC research practicum or applied capstone project under the guidance of a live academic.

Figure 2 shows that delivered value defined as solutions to important organizational problems is the first element in the supply chain. We assume that organizations located in the geographic area surrounding the academic program are most likely to enroll organization members in academic ODC programs. After all the organizational employee/students are near the university housing the ODC program. This shows up on the right of Figure 2 in the activity of identifying organizational development needs in the economic and social environment. Some of these needs will have dimensions that ODC can meet through methods of diagnosis, problem-solving, coaching, process consulting, appreciative inquiry, idealized organizational design, future search and capability discovery. The ODC faculty or program will also need some screen or process for qualifying organizational development challenges as learning lab situations for use in the academic program to build hands-on skills.

Figure 3 shows how ODC faculty and students diagnose and solve problems or help organizations design and work toward realizing more attractive futures. This instructional process translates into greater understanding of what works and what does not work both for students and for faculty members coaching and instructing them. Faculty involvement is to help the student understand organizational development and change management at a deeper level which lets the student adapt his or her codified knowledge to the particulars of future situations. In turn, the faculty sees each student research practicum as a case within the faculty's broader research model.

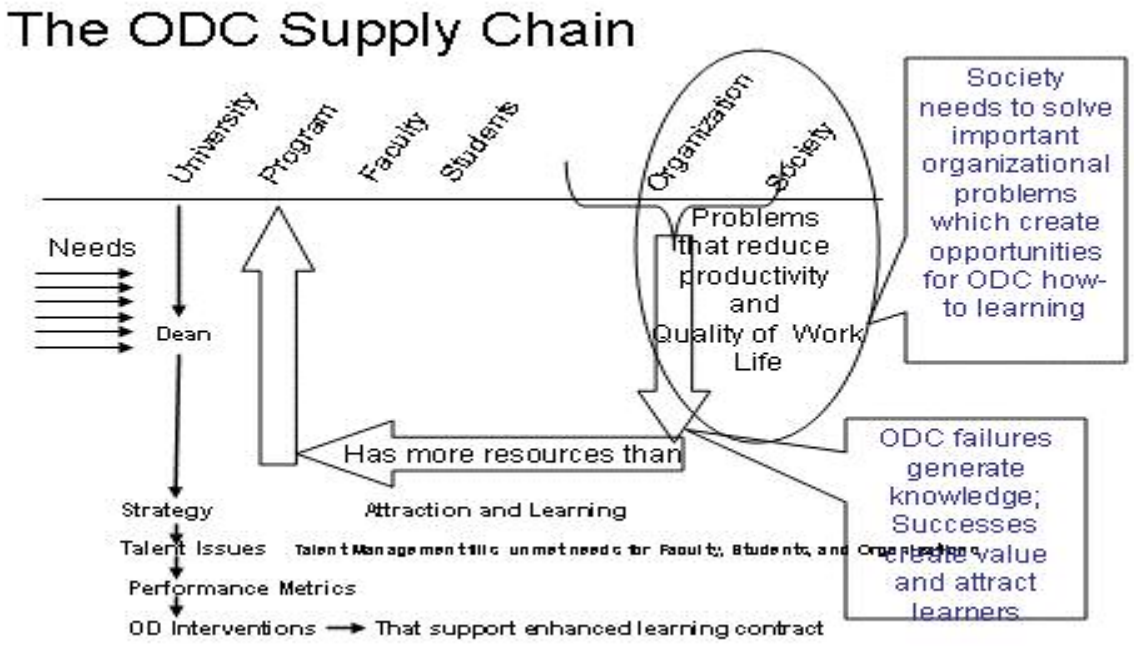

Figure 2 -- Identification of important problems that provide opportunities for learning and creating value

If several academic programs cooperate in researching and learning from organizations in their respective locales the potential exists for performing larger scale research studies. Multiple observation studies would demand a suitable method for documenting, describing and categorizing case studies and standards for documenting results of interventions. This assumes that the cooperating ODC programs establish certain minimum requirements for documentation of research studies, to ensure that learners fulfill degree requirements, and to protect validity of data faculty use in advancing knowledge of Organizational Development and Change Management.

At some point, successful graduates and accumulated knowledge reaches a tipping point either for the ODC field as a whole or for specific academic programs. Beyond that tipping point ODC programs become comparatively more attractive to talent. For example, talented people are attracted to study engineering and medicine at research universities by the prospect of participating in research and the prospect of interesting future job opportunities. Once the knowledge accumulated within the ODC field passes the hypothetical tipping point of scope and validity, ODC's ability to attract talent and resources will become proportional to the field's delivered value through the operation of the whole supply chain until an approximate equilibrium arises between the supply of research and graduates and the demand for help with development and change from organizational consumers and sponsors.

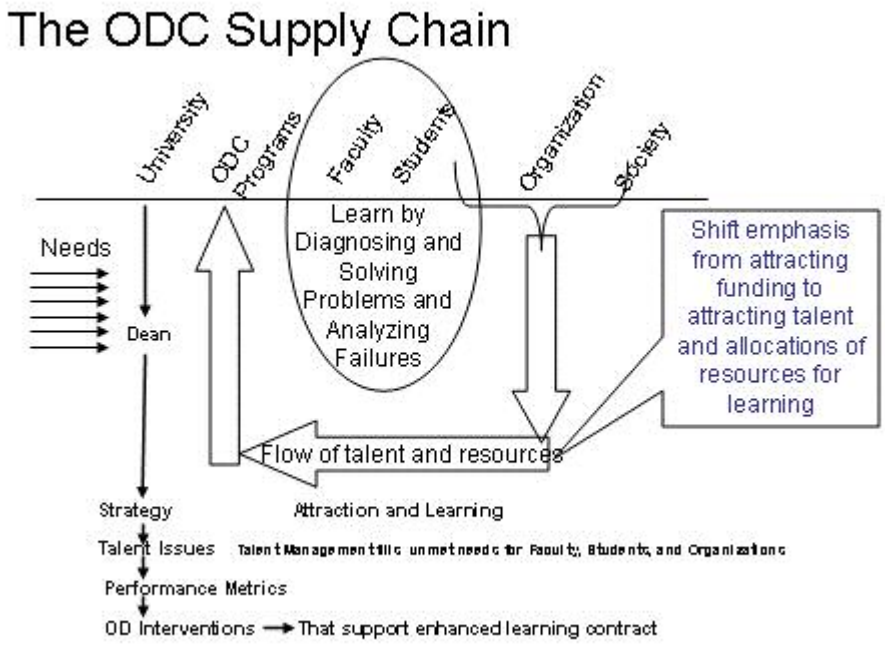

Figure 3 -- Use of ODC knowledge to solve problems attracts others interested in those problems

The implication of this supply chain model for ODC programs is that we must shift from push programs in which instructors teach what they know to students to a pull model in which students come into the program bringing with them real organizational problems. The switch to push from pull follows from the need to learn certain. This demand for learning and solutions will stimulatge research, publishing and learning.

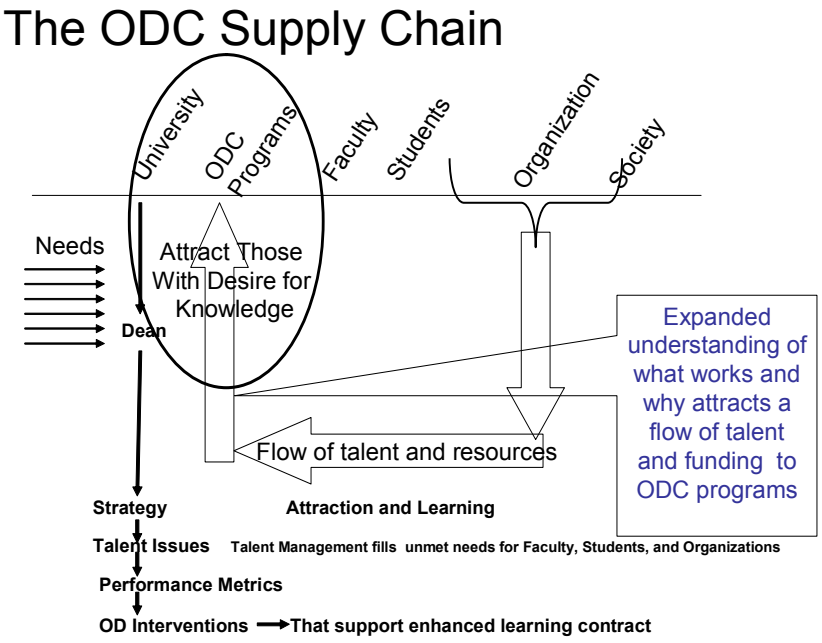

Figure 4 – A sustainable closed loop of discovery, expanded capability and talent attraction develops the field

Rosa Colon's Supply Chain Contract

After Dominck Volini explained his future state for ODC as an academic enterprise based on attraction due to a synergy of problems, capabilities and solutions that deliver value and meet needs, Rosa Colon summarized the implication of this supply chain as a shift in the that the OD Contract from

AS IS CONTRACT = STUDENT + $$ + TIME

To

SHOULD BE CONTRACT = STUDENT + $$ + TIME + RESEARCH, LEARNING LAB

In the new contract, the students and organizations that they come from become suppliers to the academic program, however, they supply access to their problems for use as subjects of academic study and guided intervention as a focus for the course of study. Thus, applicants for an academic ODC program would not only be accepted based upon their personal characteristics, but would also be evaluated on the significance and prospects for learning inherent in the problems that motivate their interest in an ODC degree and their employer's willingness to support the cost of that academic program.

The major shortcoming of this conversation was that there was not enough time in our breakout session to discuss practical mechanisms for designing and implementing some version of the supply chain. Filling in this gap is the main purpose of this article.

Three Reference Cases – Medicine, Economics, Engineering

This section uses rough analogies to implement Russ Ackoff's advice to think outside of the box (See Working Paper MFS-002) and to address ODC as a problem area in which solutions are designed by art more than by science at our present level of understanding. The following analogies and discussion suggests designs or mechanisms that can allow the ODC Supply Chain to develop because of the availability of learning opportunities that also present opportunities for showcasing talent and competence. Each of the analogies is chosen because it appears to share salient characteristics with ODC as I understand it.

The three narratives and accompanying tables display analogies (Medicine, Economics and Engineering) as straw men or reference cases to parallel with and contrast against ODC. Each analogy provides a reference case for identifying relevant dimensions and challenges that may need to be addressed in putting ODC on a sound academic footing. The first two columns describe each analog reference case and puts the analogy side by side against ODC. The columns to the right of the comparison present similarities, differences and implications. After highlighting similarities and differences the tables infer or hint at implications for ODC as an academic discipline.

1. Medicine or education in the practice of medicine appears to provide an analogy to aspects of academic ODC. Both medicine and ODC share a system-oriented, symptom, diagnosis, cuase discovery, prescription, intervention-oriented approach to practice.

   In the medical field, education of clinicians begins by laying a foundational understanding in relevant sciences such as biology, physiology, organic chemistry, molecular biology and so on. On this, the future clinician must add in-depth study of the system of greatest clinical interest, the human body, both as a structure (gross anatomy), followed up by learning about its principle functions and systems for performing them within a human body – nervous, cardio-vascular, muscular-skeletal, lymphatic, endocrine -- both as they function normally, and how they fail and become disordered. Finally, there must be extensive learning of technical knowledge such as pharmacology and clinical skills in diagnosis, treatment, maintaining doctor-patient and working relationships with other practitioners and specialties in order to deliver effective and efficient health care and treatment in the context of an overall healthcare mellieu.

   If a person educated as a medical doctor wishes to do advanced medical research, the clinically oriented learning of medical education may have to be supplemented and deepened with mastery of the scientific method, measurement and statistical analysis, and methods of analysis, inference and investigation of medical phenomena.

   In organizational development and change management, one possibility is to postulate a similar dichotomy between the knowledge and skills of a clinical physician and those of a medical researcher. Organizational development might play the role of collecting, accumulating and codifying knowledge of problems, organizational "diseases," and opportunity areas for discovery of new knowledge, similar to medical research, while change management is the application of the organizational knowledge to clinical practice within actual organizations.

ANALOGY		SIMILARITIES, GAPS AND IMPLICATIONS		
Medical Education in Clinical and Research	**OD& C**	**Similarities**	**Gaps**	**Implications**
Foundational understanding of sciences (biology, physiology, organic chemistry, molecular biology, etc.) Long standing scientific research has led to solid foundations	Foundational understanding of individual and organizational psychology and sociology, human communications, ethics, gathering and analysis of qualitative data	Medicine combines Science and Art in reverse proportions from ODC because of Medicine's stronger scientific foundations	Much ODC knowledge is pre-scientific based on reflective practice. Scientific validity of ODC's foundational knowledge is limited.	Need a scientifically grounded National Institute for Research on Organizational Development (NIROD)
Learning about gross anatomy and systems with biological functions	Learning about organizations and their major human systems for authority, justice, and political activity, communication, motivation, (reward, recognition), member selection and hiring, alignment around mission and integration	Some ODC major systems identified but no standard terminology,	ODC has no Grey's Anatomy; No census exists on the entirety of organizational systems, subsystems; no equivalent to comparative anatomy	Need a handbook of organizational structures, systems, with a process for, expanding and updating with new knowledge.
Learning about normal and abnormal functioning of major bodily systems – diseases, disorders and illnesses	Normal functioning of organizations and the human systems that make them up, as well as ways in which organizations malfunction.	Some diseases and disorders identified in both fields	Organizational "diseases" not well defined and classified. E.g. some OD academics view managers as the "enemy"/problem	ODC needs the equivalent of diagnostic groupings to map symptoms into knowledge about system malfunctions
Learning technical knowledge such as pharmacology and clinical diagnostic, treatment, and patient interaction skills as well as professional and ethical norms	Some ODC programs include a practicum or change project on which students may acquire skill under the tutelage of experienced faculty	Both fields rely on a diagnosis, disease, prescription, treatment/intervention process. Clinical patients permit hands on learning	Physician and patient are distinct in medicine, but practitioner is a temporary or permanent part of organization of interest.	No general agreement on clinical skills and ethical or professional norms.
Preparation for academic research; learning the scientific method and methods of investigation.	Unclear what education and training in scientific method or experimentation is required, if any.	Medicine and ODC have many research opportunities	No "Nobel Prizes" for ODC	Claims of ODC's scientific grounding are shaky.

2. Economics is both a well-regarded field of social science supported by research in virtually all major universities, but it also is supported by highly capable theory building and tool development. Economic research establishments build tools and theories in econometrics, economic statistics, forensic and behavioral economics, and these tools and theories find extensive use in public policy analysis and prescription (e.g. the US President's Council of Economic Advisers.)

   Society funds economic research because of the importance of wealth creation and distribution to all parts of a nation. With the exception of the communist experiment, most economics revolves around understanding monetary and non-monetary "markets." Economists in training are first taught the basic theoretical constructs revolving around supply and demand which explain the behavior of markets; they study the role of information in economic decisions, as well as micro and macro economics which help explain the behavior of individuals, firms and national players within markets. Economics also delves into the reasons why markets or whole economies fail to perform appropriately, why economic depressions, inflation, under-employment and unemployment occur.

   Most economic professionals examine the impact of changing economic activity on their employer organizations, or advise governments on the economic impact of various policy proposals, rules and regulations. Economics is also a highly regarded research and teaching field at the University level. Note that the recently resigned President of Harvard University, Larry Summers himself an economist, is the son of a Wharton School Econ professor. President Summers lamentably suffered from a lack of understanding of organizational behavior and development which led to the failure of his presidency and a major opportunity loss for Harvard.

ANALOGY		SIMILARITIES, GAPS AND IMPLICATIONS		
Economics	**OD& C**	**Similarities**	**Gaps**	**Implications**
Foundations of economic philosophy defined issues arising from creating and distributing wealth at individual, firm and national levels. Philosophical research commenced over 250 years ago, (Adam Smith, David Ricardo, Henry Malthus) followed by theoretical (Karl Marx) and empirical research (Wilfredo Pareto). Branch of contemporary economic research includes behavioral science, broadening the foundation range of economics' validity.	ODC appears to lack a clear phase of organizational philosophy to formulate the major issues and assumptions. It appears to be more reactive, reaching out to for models from individual and organizational psychology and sociology, human communications, ethics, using methods for gathering and analysis of qualitative data as needs arise. Issues of social justice within organizations are dealt with implicitly.	Economics and ODC both deal with softer, more human phenomena than the hard (physical) sciences which look at natural laws.	ODC is much younger than economics and has accumulated less empirically supported and validated theoretical knowledge	Initial research programs needed to put ODC on a scientifically grounded foundation need to identify, classify and empirically test alternative theories, which may simply exist in the form of pragmatic practices in the field.
Learning about structures and forms of economic activity, perfect and imperfect competition, role of perfect and imperfect information in economic decisions, and major problems that motivate interest in economics.	Learning about organizations as vehicles for achieving larger, future objectives than individuals can attempt. Examining how processes and individuals act in organizations and are, in turn, acted upon by those organizations.	No general agreement on the types of organization, or on the tools for describing how those organizations function.	Economics as a field thinks it knows what the important variables are; ODC has not yet developed the list of candidate variables.	ODC needs to identify the main mechanisms (cooperation, conflict, coordination, etc.) by which organizations work and the variables that describe them.
Learning about problems and disturbances in economies and economic organizations (e.g. depressions) or creative destruction. (Schumpeter). Attempts to build predictive and normative models.	Limited understanding of normal functioning of organizations and the human systems that make them up, as well as ways in which organizations malfunction. Low predictive power of models and lack of theoretical framework all but rule out normative approaches except on ethical grounds.	Important problems identified in both fields. No lab experimentation possible for learning to build and tests models vs. data.	Normal organizational function is not well understood. Organizational "diseases" not well defined or classified	ODC needs an updated Addison Wesley Series in Organizational Development to define its problems and to publicize models and interventions to practitioners.
Preparation for academic Economics research; learning the scientific method and methods of economics.	Unclear what academic preparation is needed/ or best suited for pursuing rigorous research in ODC.	Economics and ODC have many research opportunities	National governments pay for economic research, not so organizations.	ODC may have to exist as a practical art with limited but growing scientific content.

3. Engineering seems to provide a very close analogy to ODC except that the subject of engineering is the design and creation of mechanical, electrical, chemical or physical systems to meet various needs while the subject of ODC is the design and creation of new human organizations and interventions in existing organizations to achieve stated objectives or levels of performance. Engineering exists at virtually all levels of scientific knowledge as the applied twin of discoveries made in basic scientific research laboratories. Often, the public views major accomplishments in technology (such as a manned voyage to the moon), as the work of scientists, when in fact, it is the result of thousands of engineers and designers using scientific knowledge that in many cases was discovered by scientists working hundred of years earlier.

   The education of engineers is very demanding of the learner because of the vast accumulation of theoretical and scientific knowledge of physical reality and because of the complexities of the language of mathematics needed to represent and manipulate physical systems in accordance with physical "laws." The practice of engineering also appears to parallel aspects of academic ODC. In engineering, education of future engineers begins by laying a foundational understanding in relevant sciences such as physics, chemistry, and mathematics, followed by more applied knowledge arising from the study of phenomena such as electro-magnetic fields, fluid flows, the nature of matter and the strengths and properties of materials – beams, structures, and the like. To this the future engineer must add in-depth studies of actual systems, usually accomplished through extensive involvement in engineering laboratory courses in which engineered systems are run, measured, analyzed and researched through hands-on experiment. Engineering understanding of failure and malfunction is taught by considering the normal workings of materials and systems and examining the limits of their performance which determine whether or not a particular design is likely to fail when stressed beyond normal or design limits.

   A vital part of all engineering education is teaching engineers to build models of their designs and to test these models using various empirical and theoretical tools including simulation, mathematical modeling, and the like. Any aspect of a design that violates a physical law will fail, so understanding if a design lives within allowable ranges of key parameters gives the engineer a means for designing around likely sources of failure. Engineers also need to learn how and why their designs fail to perform as intended. They usually have training in scientific method, statistics and they frequently work with more senior and experienced engineers for several years in order to develop the extensive technical and practical knowledge of the domain they work in. So, two engineers that graduate from Penn with the same courses and degrees might within ten years have become a naval systems designer and an automotive systems designer, with very little in the way of common skills or technical knowledge. The differentiation between two engineers who began with identical educations arises from their early working associations and project assignments made by the employers they chose. Many engineers, who start out in engineering find that their personal preferences and ability to learn from practice gradually leads them out of engineering work completely and they start businesses or manage other organizations.

   An engineering student who decides that she or he would like to do advanced engineering research can pursue advanced studies in a wide variety of specialized fields. Usually the fields of advanced engineering study in each university bear some relationship to the industries that hire the university's engineering graduates or the research interests of the faculty which

determines the amount of funding they can attract for research and support of graduate students.

In organizational development, consultants may be involved in helping an organization redesign its communication, ethical and due processes, authority and responsibility relationships, or to design a better future for itself and then map out practical steps to make that future a reality, or ODC practitioners may be called on to diagnose an organization that is not performing as it should and design a process of interventions which can modify the working of the organization in a way that it can resume developing as it should, and on its own.

ANALOGY		SIMILARITIES, GAPS AND IMPLICATIONS		
Engineering	**OD& C**	**Similarities**	**Gaps**	**Implications**
Foundations of engineering date back to Ancient Egypt and Imperial Rome. Those capable of playing the role of engineer were vital to economic and military functions of even primitive civilizations. Engineers were pragmatic practitioners until the advancement of science began providing useful knowledge that engineers could use in designing new solutions to old problems All modern engineers first receive education in scientific knowledge..	Even academic ODC appears to have grown out of the pragmatic practitioner phase which arose from Mary Parker Follett's experience in managing a non-profit in the late 1800's up to and after WWII. Organizational issues were important to getting the best results with the minimum efforts. ODC still appears to be a collection of maxims, practices and tools that have worked in the past. Even tools based on theory, such as the MBTI have not done well when their predictive efficacy has been studied rigorously.	Engineers design things that work, ODC people design organizations that work and design and conduct interventions to help organizations develop higher capabilities and aspirations and work more effectively.	Engineering operated for nearly 2000 years by incremental learning and improvement before the scientific age accelerated progress. ODC's history of learning and incremental improvement is much shorter and its age of science has yet to arise.	The locus of progress in ODC is likely to be outside of universities but in close relationship to universities so that new discoveries can be tried out in practice as soon as possible in the field.
Engineering exists at virtually all levels of scientific knowledge as the applied twin of discoveries made in basic scientific research laboratories. Engineering accomplishments put new scientific knowledge to work in the design of new and better technology.	Organizational development in the sense of maximizing the realization of human potential can put learning to work at all levels of knowledge. ODC can thus parallel breakthroughs in individual and group psychology, anthropology, sociology, and communication	The first concern of both engineering and ODC is to get the job done in a way that works. Solving the problem takes precedence over the science.	Engineers accumulate and share knowledge about what works in handbooks which create a common professional language. Not so ODC.	Just as Roman engineers did over 2,000 years ago, ODC needs to study which organizational bridges have collapsed and which have held up and summarize what factors made the difference.
Engineers in training must master a vast accumulation of theoretical knowledge of physical reality and the language of mathematics needed to represent and manipulate models of physical systems in accordance with physical "laws."	There is limited theoretical knowledge useful in providing normative models of organizational design and intervention.	Design is the preferred means to avoid failure in the entities of interest. Organizations should be designed to develop, not fixed when they don't. Lab experiments are required to learn hands on skill.	There are few robust organizational design principles. And fewer generally accepted practices for designing ODC interventions	Role model practitioners codify knowledge by contributing to comprehensive handbook of what is known with links pointing to deeper references. Students must learn in labs with role model faculty mentors.
Preparation for engineering academics stresses application of scientific knowledge to an applied domain or specialty.	Rigorous post graduate research in ODC will require access to organizations willing to serve as learning laboratories.	Engineering and ODC will receive support in proportion to their successes and learn in proportion to their failures	ODC successes are hard to prove, so cost benefit payoff and credibility are issues.	ODC programs may have to specialize in problems of the types of organizations that support them and benefit from hiring ODC graduates.

Potential Implications of the Reference Analogies for Developing the Field of ODC

Even close analogy is very far from being a proof, and lacks the rigor of formal cause and effect based reasoning. However, when an analogy captures relevant properties of the subject of interest, reasoning about parallels and differences can suggest new insights. The three reference cases just outlined – medicine, economics and engineering – suggest that we consider the following implications for the emergence of organizational development and change management as rigorous and respected academic disciplines.

ODC needs a scientifically grounded National Institute for Research on Organizational Development (NIROD) This institute should have a network of state institutes that specialize in specific organizational domains.

- Initial research programs should identify, classify and empirically test alternative theories of organization and of how organizations develop and devolve. Where gaps in theory exist, ODC needs to codify pragmatic practices in the field as a store of knowledge and a basis for theory building. The aim of this institute's research is to eventually put ODC on a scientifically-grounded foundation.
- Because ODC is an applied field, the locus of progress in ODC is likely to be outside of universities in organizations where problems exist and need resolution. However, field work must be in close relationship to universities so that new discoveries and knowledge can be accumulated, published and disseminated for testing in wider practice as soon as possible in the field.
- State level foundations at major universities in each state perhaps supported by research opportunities and funding from local businesses might create state-level IRODs in parallel and cooperation with a National Institute. The state level institutes might specialize in organizational development of industries such as auto manufacture, health care institutions, software, or travel and hospitality services that dominate the local economy and organizational landscape.
- The Baldrige foundation and the existing network of state and local quality awards might be a suitable platform for forming academic/organizational partnerships. Firms in the performance excellence community, prove case studies and organizational "learning labs" for investigating what does and doesn't work in helping organizations sustain development and change. Organizations associated with state and federal performance excellence awards are self selected by their desire to adapt a model of performance excellence for the benefit of all stakeholders.

The ODC field needs a handbook of organizational structures, systems, with a process for expanding and updating the handbook with new and useful knowledge.

- ODC needs to identify the main mechanisms (cooperation, conflict, coordination, etc.) by which organizations work and the variables that describe their working.
- As with engineers in ancient times, ODC needs to study which organizational "bridges" have collapsed and which have held up and summarize what made the difference in a usable handbook format for practitioners and users. Many firms featured as case studies in organizational development writings have since disappeared.

- Selection of authors of handbook sections should emphasize academic and non-academic members of the community with significant practical experience and who are recognized as contributors to the knowledge base of the field. Participation in authoring parts of the handbook would help recognize those practitioners who individually constitute role models for the ODC profession.
- The handbook should be written in a non-academic tone by authorities with links to underlying research and academic literature for those who wish to dive deeper.
- The National Institute could participate in sponsoring and producing the handbook as well as serve as a focal point for professional associations..

ODC needs an updated Addison Wesley Series in Organizational Development to define its problems and publicize models and research results to practitioners.

- An edited series of monographs would permit role model practitioners to document and codify their knowledge in more detail than short contributions to the comprehensive ODC handbook. These monographs would be part of the underling literature describing what is known in detail, with pointers to other references for those who want to know more.
- This series might well consist of a revised and expanded republication of the original Addison Wesley OD Series, which several conference attendees cite as still the best literature that defines the field of OD. (This in spite of the fact that most of these books were written thirty years ago.)
- In practice, it is often unclear whether organizational, managerial or process problems caused substandard organizational performance. ODC needs the equivalent of diagnostic groupings to map symptoms into knowledge about patterns of causation for social system malfunctions**.**

ODC academic programs need the equivalent of teaching hospitals or engineering laboratories in which subject systems may be investigated by students under the mentorship of master practitioner faculty.

- Only the field of economics, out of the three reference analogies, does not permit students ready access to lab examples for experimentation. Even, then, studies of past public policies (tax hikes, interest rate cuts, anti-trust actions, labor law changes, investment tax credits and the like) have the nature of unplanned, uncontrolled experiment which can be modeled and analyzed statistically using data gathered as needed by the model. The result is expanded understanding of economic mechanism.
- The role of laboratory in the academic process increases as the emphasis of art and practice expands in a field. Without valid and powerful predictive and normative theories, (which arguably may exist in economics); ODC expertise comes from practicing in a learning lab setting or in a live organization willing to serve as a teaching/learning lab example.
- Organizations that are pursing performance improvement following an (deficit based) assessment model such as Baldrige or EFQM, or even trying to deploy a business-wide quality management system for independent certification (e.g. ISO9000:2000) may pose ideal laboratories for ODC learning labs. These organizations tend to be self selected by motivated leaders. Unfortunately, they

would present a biased universe for study, but no worse than in most fields of research.

- Prescriptions for performance improvement even when suggested by a deficit model may themselves be viewed as lab exercises in the art of organizational design using appreciative inquiry, idealized design or future search methodologies.
- The key to generating knowledge in such learning lab situations is to document explicitly what was done and why, and what was not done and why in response to a diagnosis. Then, after the intervention, when results are known, it will be possible to evaluate (a) what worked, (b) what might have worked but was not tried, (c) what did not work and (d) what might not have worked even if it had been tried. ODC's capability as a field will expand as we increase our understanding and ability to answer "What if?" questions.
- Firms that offer themselves and their performance improvement efforts as learning labs for academic programs might be expected to contribute to the cost of delivering ODC services, especially if their performance improves. Also, the Baldrige foundation and state and local excellence awards might support ODC efforts that help their members and supporters improve performance.

Medicine, economics and engineering are generally recognized as academically challenging fields of study in rigorous universities. Advance degrees in these fields from such universities are hard to obtain and professional positions in these fields are nearly impossible to obtain without the knowledge and skill that comes from earning such advanced degrees (irrespective of any licensing issues that may apply). Yet there are many applicants for the limited number of seats in high quality graduate-level degree programs in even the most demanding of these fields – for example, application rates for the most challenging engineering programs at MIT or Stanford. As a result, those programs have a choice of talent from which they can pick and choose in deciding which students their faculty will work with.

- Talented individuals are attracted to programs that offer challenges which will expand the learner's understanding and personal capability to solve problems that interest them.
- ODC must become much more problem- and solution-focused and identify itself with inherently human-based, rather than economically or technologically-based organizational problems.
- ODC needs to identify the talents and character traits of those who can be most successful in learning and applying ODC methods and in helping others to learn those methods.
- Each applicant for an ODC advance degree program should bring with him or her some significant organizational problem or area of challenge that motivates his or her and provides the laboratory experience they need to learn from the faculty.
- Each faculty member must be willing to work with his or her students in "laboratory-based" courses working on the organizations students represent or have come from in order to expand the base of knowledge of the ODC field and to support the student in applying.

- Learning from ODC laboratory based courses must be captured and documented, categorized and used for theory building and further theory testing. Faculty talented in theory building and testing must participate in laboratory courses led primarily by experienced practitioners.
- As in engineering, change management appears to focus on the application of theoretical knowledge generated by others (scientists). If organizational development is the accumulation of theoretical and scientific understanding of organizational phenomena, then change management is its engineering counterpart.
- Just as any mechanic can do a little bit of "engineering" virtually all business people who function in an organization subject to external shocks and upsets (due to economic, technical, demographic, competitive, governmental, social or other forces) must master and use change management capability at some level of proficiency.
- Organizations and sectors that are subject to the greatest number of stressors, and therefore must adapt most rapidly to environmental change, have the greatest need for ODC and may represent the best laboratories in which to generate learning and train new ODC experts.

Claims of ODC's scientific grounding are shaky. Its claim to legitimacy lies in its organizational design, effectiveness and mission shaping functions which can be viewed as (and may actually be at our present state of understanding) artistic endeavors, much as architectural or landscaping design are now.

- ODC may have to exist as a practical art with limited but growing scientific content as the foundation social sciences make discoveries. If so, more rigorous methods of sharing experiences need to be found. Perhaps a library of cases of organizational development which document interventions and outcomes might serve as a basis for educating new practitioners.
- To the extent that we view ODC as an art of design, organizational development needs to emphasize much more powerful qualitative data gathering and analysis tools, and where possible, look for better ways to bridge the gap between inherently qualitative organizational phenomena and concrete, measurable constructs. This is something that the field of market research in business schools has been extremely successful in accomplishing.
- No general agreement on clinical skills and ethical or professional norms exists within ODC. This presents problems in much the same way that lack of ethical or professional norms in medical practice would present problems to hospitals and patients.
- Why should stakeholders in any organization trust an "organizational development and change" expert? What degree requirements would establish such expertise? Under what conditions, other than caveat emptor, should an organizational development degree holder ethically be allowed to advise organizations professionally?

The above implications provide a first cut straw man for review and criticism. The availability of several models of academic fields which progressed from art and

philosophy to serious University level status offers some guidance for development of ODC as an academic discipline. The reference cases also provide some hints at how Universities, with cooperation from others, might be able to rewrite the as-is contract of ODC education to engage willing organizations more fully, both as clinical examples for university instruction and learning and also as sources of funding when the interventions generate value and benefits for the organizations that participate.