Session Number ???

The ethics of systems thinking

Nathan Harter, Mark Dean, Donna Evanecky
Purdue University

The search for a science of management has moved from a Newtonian perspective to a quantum perspective. Margaret Wheatley emphasized this shift in perspective with her prize-winning book *Leadership and the New Science*.[21] Whereas the Newtonian perspective was reductionist, treating organizations as machines and breaking them conceptually into component parts, the quantum perspective treats organizations holistically. In fact, it treats organizations not only as integrated systems, but also as participants in larger systems. These larger systems include political systems, economic systems, and eco-systems.

The shift toward a quantum perspective has placed systems thinking near the center of different fields of study, such as mathematics, physics, and biology. Because a comparable shift has been underway in the managerial sciences, systems thinking as it would apply to human organizations has also generated interest. Theorists associated with this shift include Jay Forrester, Russell Ackoff, W. Edwards Deming, and Peter Senge. These writers show how it is possible to view organizations as social systems.

When organizations are viewed from a Newtonian perspective, there are ethical concerns about determinism, social engineering, and the dehumanization of the workforce. The great clockwork model reduces human beings to cogs in a machine, resources to be deployed by trained specialists – a model in other words with implications for ethics. As engineers turn toward social systems as a way of understanding and leading human organizations, they must consider the ethical implications of their new perspective.

This paper asks whether the shift toward systems thinking alters the landscape. It might be that systems thinking is, from the standpoint of ethics, nothing more than a more sophisticated version of the previous perspective. If this is the case, then systems thinking inherits the same ethical concerns. At most, perhaps it obscures or exaggerates them. Optimistically, it might be that systems thinking resolves previous concerns. By the same token, it might raise entirely new ones. In other words, this paper begins to examine the ethical implications of systems thinking in organizational settings.

Thinking well and ethics

Simon Blackburn, a philosopher, writes that what he does is conceptual engineering. He studies the structure of thoughts.[3] Systems thinking requires its own conceptual engineering. The goal would be to reflect on the structure of thoughts and ideas contained in systems thinking. Seen in

this light, ethics and conceptual engineering can be said to have two connections to systems thinking.

- Thinking well is ethical.
- Ethics requires thinking well.

We are primarily interested in the second connection, but it is important to mention that it is ethical to think well. As a general principle, it is better to think well than to think poorly.[3] People in our situation can be said to have a duty to seek the truth and gain knowledge about ourselves and the world. When it is a matter of choice, we do wrong when we neglect to think well. It is especially wrong to be negligent or sloppy in our thinking when it comes to our professional roles as teachers and as engineers.

Because we have an ethical obligation to think well, the question arises whether systems thinking assists us in our "conceptual engineering" – that is, does it help us to think? Other writers have already attempted to answer that question. In the field of leadership studies, for example, one could investigate the work of Talcott Parsons, Niklas Luhmann,[16] Jay Forrester,[6-10] Russell Ackoff,[1] W. Edwards Deming,[5] Peter Senge,[20] and Margaret Wheatley.[21] There is no reason to duplicate their work here. We endorse this project because we certainly believe it is ethical to think well, but for present purposes we ask ourselves instead a second question, from the other direction, as it were, and that question is whether systems thinking helps us do ethics.

According to what are known as cognitivist theories of ethics, the claims of ethics are grounded in truth. In other words, ethics without truth is at best mere feeling and desire – and at worst incoherent nonsense.[3] According to this line of thinking, moral judgments possess truth-value.[12] To the extent that systems thinking helps us to think about human organizations, it helps us to do ethics. We are likelier to think well about ethics if we possess a superior way to think.[3]

Suppose a worker slips and falls in a factory because of a spill. The manager – peeved about her safety record and lost productivity – wants to find what caused the accident, so she plays the blame game. Who was at fault? Was the worker running carelessly? Who made the spill to begin with? Why didn't they clean it up right away, or at least notify someone to clean it up? Why didn't a janitor clean it up? Blame isolates the persons or persons who might require discipline or training. Find the culprit, fix the problem. That is a common managerial response.

If it was truly nobody's fault, a genuine accident, that still leaves open the question how to prevent the same type of accident from recurring. To do that, a manager has to discover who would be in a position to do that.

Systems thinking "frames" an event such as an accident as part of a pattern with underlying systemic structures.[15] A manager can look past an isolated incident and see instead the part it plays in the larger scheme of things. Perhaps the spill comes from an overhead leak in a part that turns out to be cheaper than the parts next to it. The new part is cheaper because it is inadequate, but the people in purchasing are being rewarded for bringing costs down. Buying cheaper parts makes them look good. They would have no reason to know that their cost savings might have contributed to this accident. They may never see the connection. The manager's response to this incident will be more nuanced after thinking systemically.

Suppose that the manager wants to do something to prevent accidents of this kind. She can try any one of a number of methods, ranging from safety posters in the break room to some kind of high-tech flooring that helps with traction. These interventions are probably sub-optimal, however. Given what we know, systems thinking enables the manager to locate the optimal point of intervention (i.e. the reward structure for the purchasing office), and in that way she can achieve her purpose more efficiently. She will have identified her end and discovered the best means for achieving that end.

Systems thinking is by no means magic. It is a perspective. It helps us to think better. Nonetheless, there will always be ethical concerns in human organizations. No matter how well we think, we cannot escape the ordinary tensions of life together with other people. Conceptual engineering does not resolve them all. To imagine otherwise is to expect too much from systems thinking. Even so, it can help a person who is trying to act in an ethical manner.

Who deserves what?

Two of the classic approaches to ethical theory pertain to *intentions* and *consequences*. Probably the best known theory concerning *intentions* is associated with Immanuel Kant, whose primary concern had to do with the duty a person owes to others. One of the best known theories concerning *consequences* is associated with John Stuart Mill, whose primary concern had to do with maximizing happiness. For both theories, an important step is identifying the stakeholders:

- To whom do you owe a duty?
- Whose happiness is likely to be affected?

Systems thinking can be seen to help and hurt with this task of identifying stakeholders. On the one hand, it expands the range of stakeholders to include everyone within the system – managers, co-workers, vendors, customers, and so forth. Stakeholders are less likely to be overlooked. On the other hand, by expanding the range of stakeholders in this way, the cast of characters is almost too big and too diffuse to help.

When people do things within systems, their behavior tends to be a response to the promptings of the system. That is one of the insights attributable to systems thinking. There is a risk in systems thinking to dilute blame for certain behaviors by blaming the system – or at least by blaming its designers and managers. In other words, behavior that was typically regarded as unethical, such as accepting kick-backs from vendors, can now be seen as a flaw in the system, to be corrected by altering its design, rather than as a defect of character, to be corrected by training, discipline, or removing the guilty employee. Are individual participants responsible for their behavior or is the system responsible? That is the question.

Of course, with greater clarity about systems comes greater clarity about each individual person's role in making that system work. In one sense, when things go wrong ethically it should be even easier to isolate the blameworthy person, just as it should be easier to isolate the praiseworthy person. In other words, systems thinking promises to draw a closer correlation between what a person does and what they are responsible for. From this perspective, systems

thinking dilutes blame only when it belongs to the system itself. It doesn't simply absolve everything. A person who steals from the company or discloses trade secrets is still accountable.

In fact, systems thinking contributed to the finding known as the butterfly effect, which states that as a matter of feedback in complex systems, minute variations in the original conditions can have an enormous effect later; statistically, the flapping of a butterfly's wings can influence the weather thousands of miles away.[21] Systems thinking actually sensitizes a firm to the implications of small infractions. Managers would not be numb to ethical lapses; if anything, they would notice and hurry to correct them, to prevent the butterfly effect. Ethical lapses can become magnified over time.

Unfortunately, it is possible to suspect that systems thinking deflects issues of character. From this point of view, people are not wrong. They are simply behaving in inappropriate ways. Management then ought to assume responsibility for creating or permitting a climate in which this inappropriate behavior takes place. This line of reasoning is not unheard of. At law, for example, employers bear responsibility for permitting hostile work environments that discriminate against women, even though individuals within the firm were the perpetrators acting contrary to the employer's policies. The firm itself can be held liable. Society generally and organizational cultures specifically bear responsibility for permitting men to do these things. The objective therefore is to restructure things – beginning with the culture and education – so that men no longer do them, or at least no longer inflict their inappropriate desires on other people. It was not unusual to hear arguments of this kind during investigations into the scandals of our military and service academies, as for example Tailhook.

Wrongdoers of every type have picked up on this line of argument quickly, by the way, passing blame to the system rather than accepting blame.

Roles and identities

Another related concern has to do with the further dehumanization of the workplace. Speaking broadly, at the Renaissance individuals took seriously the notion of playing roles in society. They looked at themselves and at others more for their roles than as complete and distinct human beings. These roles tended to be defined and assigned by the group, so that individual identity became absorbed by the group.[19] Since time immemorial, a man became a laborer for example or a lawyer, and society apportioned these roles carefully, distinguishing men by their clothing, their title, their wealth, and their status. This had happened before the Renaissance, of course, but with the Renaissance came the struggle by individuals to fit their desired roles: they now felt free to pursue these roles, rather than having them assigned at birth. Their ambition came to filling a role.

The irony was that this flush of freedom tended to lock these individuals into prescribed roles. The man who wanted to become a lawyer had to adapt himself to the profession, developing one part of his personality and neglecting another. (At those times, it usually was a man and not a woman.) In fact, for positions of privilege, the competition that evolved heightened the pressure to conform. At every level, the industrial capitalist system eventually encouraged specialization, as men spent long years of education, training, and repetitious practice to master their role – at

the expense of other interests and powers. Competition put a premium on this process. All of this preceded systems thinking and caused social critics to lament.[18]

Systems thinking might be seen as the next logical step in this process, as it isolates the mind on those system roles. The particular human beings who happen to occupy those roles are not really intelligible factors, except as sources of work and variation. People are mere abstractions. Jürgen Habermas described systems thinking as a "methodological antihumanism."[11] It diminishes us as human beings to regard people exclusively as role-playing participants in impersonal systems. (Habermas had several other objections as well.[11])

Forrester concedes that systems thinking can appear to deny free will and tends to equate human beings with inanimate objects, like cogs in a machine.[7, 8] That is a possible misuse of systems thinking. Nonetheless, by looking at systems directly and fixing them, we have an opportunity to remove pressures and constraints on individuals. As a result, individuals will become even freer. If we have been rewarding behavior, whatever it is, then we have been pressuring participants to do it. If that reward structure was misguided in some way, then we should want to repair it, and by doing this we fix their incentives.

Suppose that an employer pays employees by the hour. They now have an incentive to expand work to increase their income; but then if they can slow that work down to a tolerable level without detection, then they can work less per hour. In other words, an hourly pay structure tends to slow workers down. Piece work speeds them up, of course, by rewarding volume, but then workers will be tempted to cut corners to make rate, so they might neglect quality or bypass safety features. By paying workers a fixed salary, it might become possible to avoid these hazards of distorted time usage.[5] In this way, workers might be liberated from pressures to fill time or fill quotas. The reward structure will fit the system's purpose better, like skin, which maximizes the sense of freedom.[17]

Fritjof Capra has explained that participants in social systems are still autonomous. They can choose not to participate. They are also frequently the beneficiaries of their own systems when they do participate, so that it strains credulity to argue that successful factory workers choosing overtime are being oppressed. It is their choice. They derive substantial benefits from the exchange – benefits that make their lives better and improve their standard of living. Besides, systems require a degree of creativity from their participants.[4] Systems are constantly adaptive to the needs and capacities of their participants, so that in a sense they are incredibly free to alter their lives for the sake of a freely-chosen superordinate goal. Thus, there is reason to dispute the argument that systems theory denies free will or diminishes the individual human being.

Margaret Wheatley argues that systems theory encourages leaders to trust and involve their followers more, not less. She argues for the principle of *equifinality*, which states that there can be different ways to achieving the same end, so that once participants accept the purpose and values of the system and hold themselves accountable to it, they should be turned loose to find their own best way to perform.[21] The influence of experts will become less direct.[14] The dependence on social engineers will actually decline.

Does systems theory imply social engineering, by which a technical elite determines the organization of communities? From a systems perspective, the ideal of democratic governance and follower participation can seem inefficient and even counterproductive, although as we have just seen not everyone thinks so. There is clearly a tension between two seemingly incompatible values: on the one hand, participants should have a say in the organization of their lives, yet on the other hand, good decisions about complex systems increasingly require technical expertise.[2]

Ethical tensions as the structure of organizations

William Hitt devotes a chapter in *Ethics and Leadership* to various tensions in organizational life. These tensions result in ethical dilemmas for organizational leaders.[13] Systems thinking recognizes these tensions to be part of the structural properties of organizations. A system is in effect a configuration of tensions. As such, it fully reveals the ethical complex -- without making anyone believe that the objective should be to resolve them all. That would be impossible and probably undesirable. Rather, it prevents naïve interventions that fail to appreciate the delicate balances that characterize all human organizations. A case in point was Prohibition, based on the Volstead Act, a metastatic crusade for a single cause that warped our vast economic and legal system with unintended consequences, so that a worthy cause -- blindly imposed -- did more harm than good. Systems thinking might have come in handy at temperance meetings.

Another example of misplaced ideals would be trying to lower the price of prescription drugs at the risk of jeopardizing quality and availability. Price controls reach only part of the elaborate system of supply and demand. You cannot regulate prices and expect everything else to remain the same.

Here then is a list taken from Hitt showing the complex array of ethical tensions in the contemporary organizational scheme.[13]

- Overall dilemmas
  - End results v. Organization
  - End results v. Society
  - End results v. Individual
  - Organization v. Society
  - Organization v. Individual
  - Society v. Individual
- End-result dilemmas
  - Quality v. Schedule
  - Quality v. Budget
  - Quality v. Health & safety
  - Schedule v. Budget
  - Schedule v. Health & safety
  - Budget v. Health & safety
- Stakeholder dilemmas
  - Customers v. Employees
  - Customers v. Owners
  - Customers v. Community
  - Employees v. Owners
  - Employees v. Community
  - Owners v. Community
- Societal dilemmas
  - Quality v. Price

- Quality v. Availability
- Quality v. Health & safety
- Price v. Availability
- Price v. Health & safety
- Availability v. Health & safety

- Personal dilemmas
  - Physiological needs v. Security needs
  - Physiological needs v. Belongingness needs
  - Physiological needs v. Self-esteem needs
  - Security needs v. Belongingness needs
  - Security needs v. Self-esteem needs
  - Belongingness needs v. Self-esteem needs

Organizations are composed of tensions. Systems thinking exposes those tensions and reveals the architecture of a specific firm as a complex made up of tensions, so that attempts to resolve a tension alter the system itself, possibly exacerbating other tensions or creating new ones.

This is where we are in our thinking

Systems thinking can be understood as a tool. Used properly, the tool is supposed to help with a particular project. It has been our contention in this paper that systems thinking – used properly – can help to do ethics in organizations. It is not necessarily a tool that renders other tools obsolete, however, and we realize that on occasions when it is used improperly, systems thinking might dilute or deflect responsibility, further impersonalize work relations and self-image, and justify widespread social engineering. It is partly in order to prevent this misuse that we have undertaken a study of systems thinking at our home institution, where the conversation about its ethical implications will undoubtedly continue.

Bibliography

1. Ackoff, R. (1971, July). "Towards a system of systems concepts." *Management Science* 17(11):661-671.
2. Bausch, K. (2001). *The emerging consensus in social systems theory*. New York: Kluwer Academic/ Plenum.
3. Blackburn, S. (1999). *Think*. New York: Oxford University Press.
4. Capra, F. (1996). *The web of life*. New York: Anchor.
5. Deming, W.E. (2000). *The new economics* (2nd ed.). Cambridge: The MIT Press. (Original work published 1994)
6. Forrester, J. (1999 June 8). System dynamics: The foundation under systems thinking. Retrieved 12-3-02 from http://sysdyn.mit.edu/sdep/papers/D-4828.html.
7. Forrester, J. (1998 December 15). Designing the future. Retrieved 1-16-03 from http://sysdyn.mit.edu/sdep/papers/Designjf.pdf.
8. Forrester, J. (1991 April 29). System dynamics and the lessons of 35 years. Retrieved 1-16-03 from http://sysdyn.mit.edu/sdep/papers/D-4224-4.pdf.
9. Forrester, J. (1990). *Principles of systems*. Portland: Productivity Press.
10. Forrester, J. (1971, 1973). *World dynamics* (2nd ed.). Cambridge: Wright-Allen Press.

11. Habermas, J. (1993). *The philosophical discourse of modernity* (F. Lawrence, trans.). Cambridge: The MIT Press. (Original work published 1985)

12. Harrison, R. "non-cognitivism." In Honderich, T. (Ed.). (1995). *The Oxford companion to philosophy* (p. 625). New York: Oxford University Press.

13. Hitt, W. (1990). *Ethics and leadership* (chap. 2). Columbus, OH: Battelle Press.

14. Huber, G. (1984, August). "The nature and design of post-industrial organizations." *Management Science* 30(8):928-951.

15. Kim, D. (1999). *Introduction to systems thinking*. Waltham, MD: Pegasus Communications.

16. Luhmann, N. (1995). *Social systems* (J. Bednarz, Jr., with D. Baecker, Trans.). Stanford, CA: Stanford University Press. (Original work published 1984)

17. Ortega y Gasset, J. (1946). *Concord and liberty* (H. Weyl, Trans.). New York: W.W. Norton. (Original work published 1940)

18. Ortega y Gasset, J. (1985). *Revolt of the masses* (A. Kerrigan, Trans.). Notre Dame, IN: University of Notre Dame Press. (Original work published 1930)

19. Patocka, J. (1996). *Heretical essays in the philosophy of history* (E. Kohák, Trans.). Chicago: Open Court.

20. Senge, P. (1990). *The fifth discipline*. New York: Currency Doubleday.

21. Wheatley, M. (2001). *Leadership and the new science* (2nd ed.). San Francisco: Berrett-Koehler. (Original work published 1992)

Biographies

MARK DEAN
Dr. Mark L. Dean is an assistant professor in the School of Technology at Purdue University, New Albany. Dr. Dean holds a Ph.D. from the University of Louisville in Clinical Psychology, a Master of Public Administration from IUPUI, and a Master of Electrical Engineering from the University of Louisville. He is an ASQ Certified Quality Engineer and a Registrar Accreditation Board Certified ISO 9000 Quality System Auditor.

DONNA EVANECKY
Donna Evanecky started teaching as an assistant professor for Purdue University School of Technology in 2001 after an eight-year career in the field of quality management. She teaches Organizational Behavior, Managing Change, Leadership, Entrepreneurship, Occupational Health and Safety and Team Development for the Department of Organizational Leadership and Supervision at the Kokomo, Indiana campus.

NATHAN HARTER
Harter has been an Associate Professor of Organizational Leadership at Purdue University's School of Technology since 1989. He serves southeastern Indiana, teaching numerous courses in the program to non-traditional students. He has an professional interest in the philosophy and ethics of leadership.