

Causal Loop Modeling of Ethics Force Structures: An Exploration

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Abstract

This paper explores the use of causal loop modeling to depict the structure of forces that influence ethical behavior. Our goal is to demonstrate that this kind of modeling can capture and show the complexity inherent in ethics situations. The desire to increase ethical performance is part of a system which includes the desire to increase other aspects of performance, such as competitiveness, profitability, job security, wealth, etc. Three examples are used to demonstrate the approach. The first model depicts the generic framework of forces that shape personal ethics behavior. The second model depicts some of the forces that led to the current sub-prime mortgage crisis. The third model focuses on factors and causal loops that can combine to shape the ethical behavior of a business executive. Insights into ethics influences can be gained from the modeling process itself, and from examining the resulting model structures. These insights can provide guidance for policy makers and managers focused on raising ethics behavior. Although our models focus on business ethics in developed free-market economies, the approach is readily applicable to other contexts, such as analysis of the forces impacting on ethics in the professions or in government.

Introduction

Stories about questionable ethical behavior are a common feature of modern life. In the last ten years we have witnessed ethical misconduct in firms such as WorldCom and Enron, ethical questions leading to the demise of the major professional CPA firm Arthur Anderson, nominees for cabinet positions who have failed to fully pay their taxes, a state governor who apparently wanted to sell a vacant Senate seat, and probably the largest Ponzi scheme in history. The extent to which ethics failures contributed to the current global fiscal and economic crisis is only partially known. However, it is clear that both mortgage originators who pushed sub-prime loans and house buyers with limited ability to pay who sought those loans were both acting outside the ethical bounds that would accompany prudent risk taking. Nor did the security rating firms, which are paid to evaluate investment risk, fulfill their obligations.

As this paper is being written, a debate rages about the bonuses being paid to AIG employees who appear to have been instrumental in nearly bankrupting the firm, which then was bailed out by massive infusions of government funds. Members of Congress, the New York State Attorney General, and others are threatening legislation, legal action, and other remedies. But it is only a few years ago that Congress passed the Sarbanes-Oxley legislation in an attempt to raise ethics behavior in business!

It is clear that pieces of legislation, ethics training programs, ethics codes, and other mechanisms for raising the ethical behavior of individuals, business, government, the professions, and other institutions are only partially effective. The underlying reason is probably inherent in human nature and in human ingenuity in finding and exploiting legal and ethical loopholes. But continued ethical failures may be abetted by a tendency to take a variety of narrow approaches in dealing with the ethics problem, such as a new law or a new ethics code. These narrow approaches ignore the inherent complexity of the forces that shape our individual and collective ethics behavior. What is needed is a larger systems understanding of ethical forces; system dynamics modeling, in our view, can help develop such an understanding. Given such an understanding, we can be more effective in identifying ethics intervention points and corrective measures.

This paper explores the application of causal loop modeling to depict the structure of forces that influence ethical behavior. Our goal is to demonstrate that this kind of modeling can capture and show the complexity inherent in ethics situations. The desire to increase ethical performance is part of a system which includes the desire to increase other aspects of performance, such as competitiveness, profitability, return on investment, job security, advancement, wealth, etc.

Three causal loop models are the core of our paper. The first model (Fig.1) depicts a generic framework of forces that shape personal ethics behavior. Our hypothetical person is assumed to be living and working in a somewhat advanced industrial society, and probably working in an organization; the person may or may not belong to a profession such as accounting or engineering. The generic character of this model is highly adaptable to more specific settings; our third model (Fig. 3) provides an example of this by looking at a causal loop structure of influences that shape an individual executive's ethical behavior.

The second model (Fig. 2) illustrates how causal loop modeling can be used to depict some of the first-order influences that led to the sub-prime mortgage debacle and the subsequent financial and economic crisis. This model postulates that in ethics terms the crisis is at least a partial consequence of unethical behavior by both lenders and borrowers. The level of detail is minimal; our purpose is to illustrate causal loop modeling for a specific current failure of ethics.

The third model is significantly more complex. The focus is on factors and causal loops that can combine to shape the ethical behavior of a specific business executive. The influence categories include the general level of ethics in the society, the degree to which the society stresses wealth and consumption, the executive's personal moral development, the executive's ability to take personal risks, the ethical climate within the executive's organization, the focus of executive compensation, the intensity of competitive pressures, the pressure to reach a timely decision on what alternative is to be pursued, and the possible consequences of news media exposure and resultant social or legal sanctions.

Literature Review

Aside from the vast literature on systems thinking, systems dynamics, and systems modeling, we have not been able to find many precedents for applying causal loop modeling to ethics. Elias, Cavana, and Jackson (2000) discuss possible linkages between stakeholder concepts and opportunities for application of system dynamics. Geistauts (2003) looks at business ethics from a feedback control perspective. Pruyt and Kwakkel (2007) provide a broad ranging discussion of ethics in relation to system dynamics, including a list of ways in which system dynamics modeling can contribute to ethics understanding; however, no models are included. Geistauts, Baker, and Eschenbach (2008) illustrate how a causal loop approach can be used to model engineering ethics.

The authors cited above have explicitly linked system dynamics and ethics; but there is also an implied linkage in the much larger literature that uses system dynamics to model ecological systems, the limits to growth, sustainability, etc. If stressing ecosystems, pushing the limits to growth, and operating beyond the limits of sustainability is inherently unethical, then systems dynamics application to these issues is inherently helping to define what behavior is or is not ethical. It appears that sustainable development is particularly amenable to system dynamics modeling; Heinbokel and Potash (2001) provide one example of the use of system dynamics in teaching a course in sustainable development.

Model Assumptions and Construction

Our modeling approach follows from our intent. Our models are intended to be illustrative; they show *how causal loop ethics system models could look* but do not claim to be either definitive or complete. Thus, we proceed to postulate relatively simple common-sense relationships between pairs of variables; the complexity of the causal structures emerges naturally. We recognize, however, that some of these assumed paired relationships may be arguable, and we do not claim that each paired relationship in the models is either theoretically or empirically well established.

And of course, additional variables could be added to each of the models. (We address some of the issues associated with creating more precise models later in the paper.) We identify some of the postulates associated with each model in the respective model sections, but we do not discuss them in any detail. Again, the focus is on how such models *could* look.

As constructed, our models best fit modern democratic free-market societies. In these societies the rule of law provides a floor for ethics, but not a ceiling for ethics. Such societies have stable governments, vigorous media, strong competition both domestic and foreign, and cultures that place strong emphasis on wealth and consumption as measures of success. They also, at least on the surface, stress the importance of ethics. However, the modeling approach is robust and can be easily extended to less developed societies.

The models were created using the educational version of *Vensim*®. The convention being followed is that if the variable at the start of an arrow increases, the influence on the variable at the head of the arrow is to either increase or decrease that variable, dependent on the + or – sign respectively. An examination of the models shows that most of these signs are positive (+), but to some extent this is dependent on how a variable is defined. For example, in Fig. 2 the key mortgage ratio is Subprime/Prime; if the ratio was Prime/Subprime the signs at the arrowheads would be reversed. Each model focuses on a central variable identified by both location and larger font size. Variables that are largely exogenous are in italics.

Generic Ethics Influences Model

In the first model we show a number of major forces that combine to shape personal ethics behavior. The following postulates are the basis of this model:

1. A higher level of socioeconomic development and better government are linked, and lead to a higher level of the rule of law.
2. A higher level of socioeconomic development usually is accompanied by greater news media effectiveness.
3. Greater media effectiveness and the rule of law increase pressures for a higher level of ethical behavior.
4. A higher level of socioeconomic development may increase the focus on conspicuous success values, such as wealth and consumption, thus shaping the culture's ethics values.

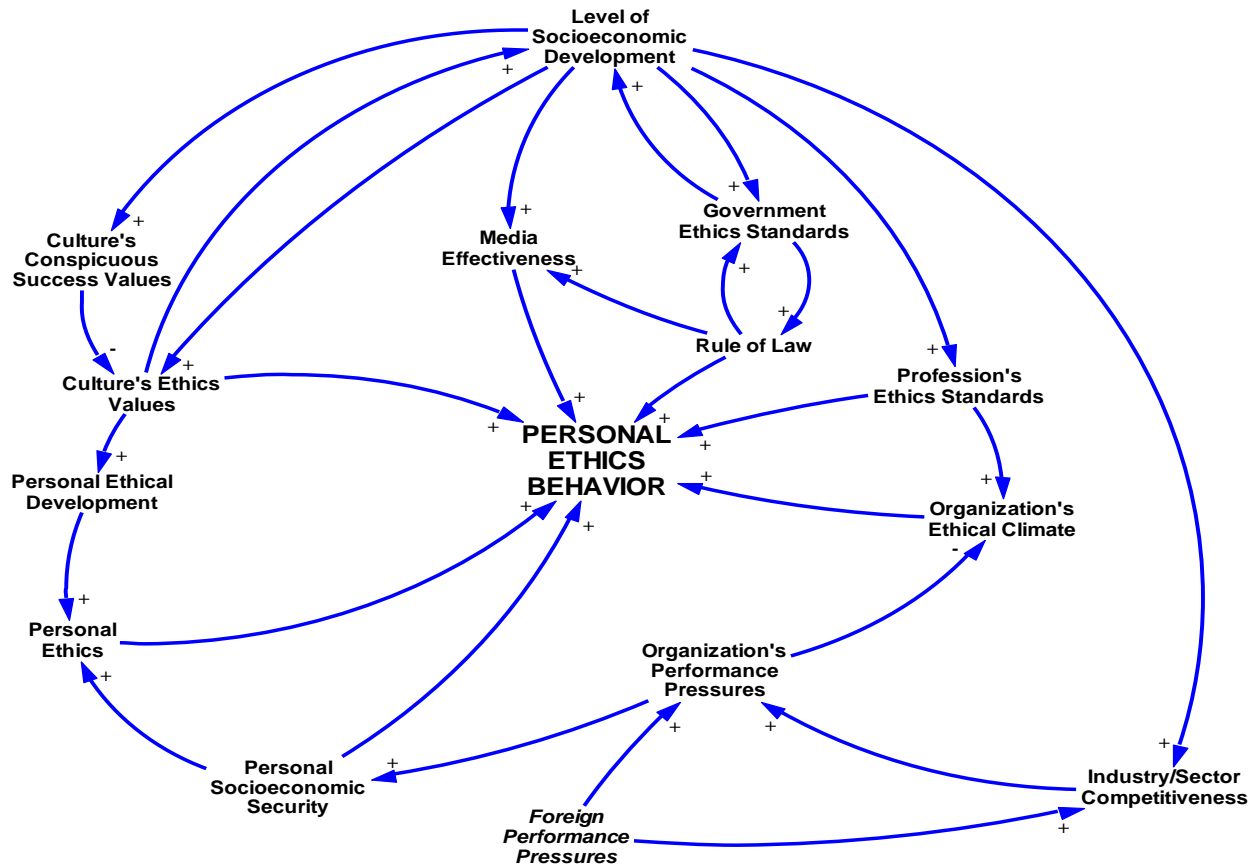


Fig. 1: Major Influences on Ethics Behavior

5. The culture's ethical values shape personal ethical development.
6. The organization's performance pressures impact personal socioeconomic security, which in turn impacts personal ethics behavior.
7. Industry competitiveness and foreign competition raise pressure on the organization to perform, even at the expense of ethics, thus reducing the organization's ethical climate.
8. Professions (e.g., engineering, medicine) have higher ethical standards in more socioeconomic developed societies, and create a force for increasing the organization's ethical climate.

Ethics and Mortgage Lending Model

The second model focuses on a current issue, where apparently unethical behavior on the part of mortgage lenders and mortgage borrowers combined to create an unhealthy ratio of subprime to prime loans. A culture of consumption is postulated to motivate buyers; high levels of loan officer commissions reduce lender ethics and increase the propensity to lend even to high

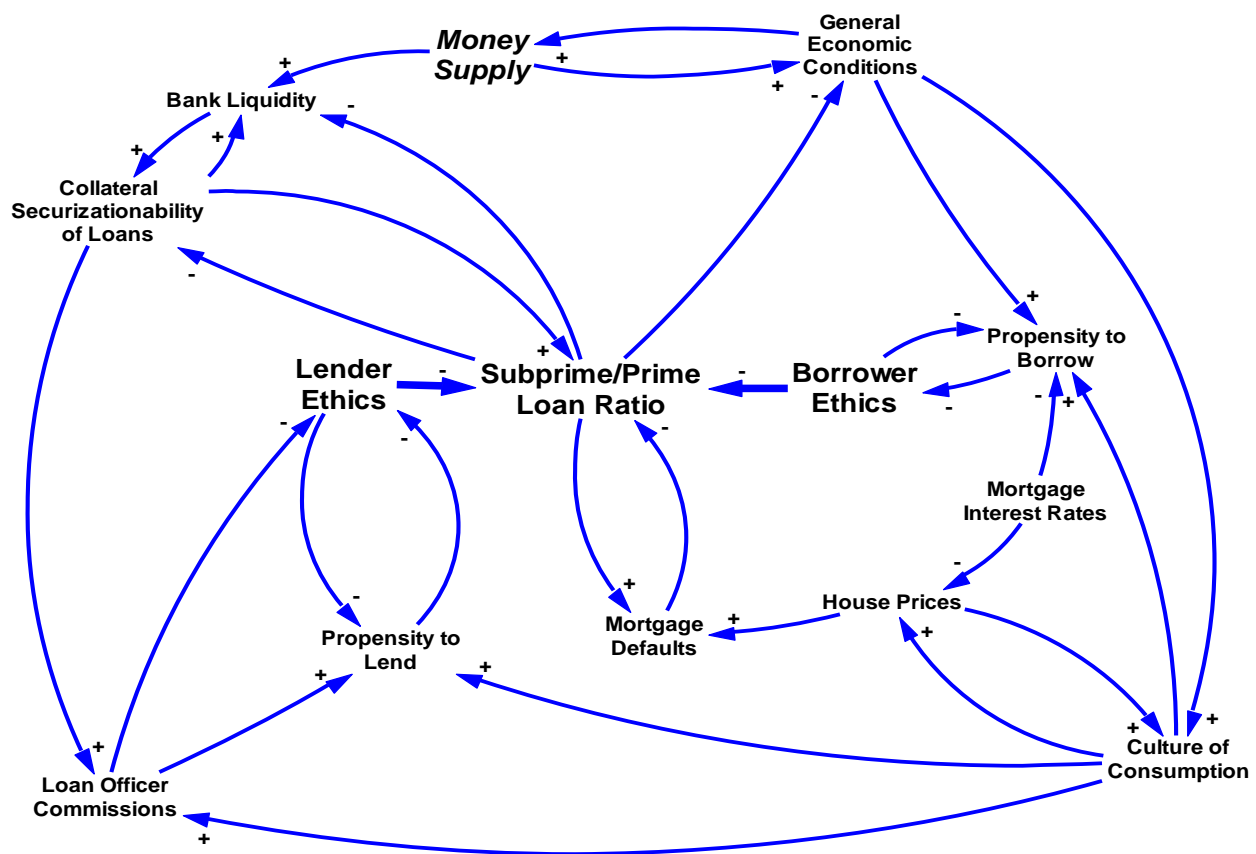


Fig. 2: Ethics and Mortgage Lending

risk borrowers. However, the model shows the self-correcting (albeit harsh) character of systems, as both the ability to securitize subprime mortgages and bank liquidity will ultimately decrease, leading to government intervention by, among other things, increasing the money supply.

Executive's Ethical Behavior Model

The model in Fig. 3 focuses on major forces and influences that can shape the ethical behavior of an executive. The overall context is a hypothetical business firm in a modern industrialized society. The hypothetical executive is assumed to have substantial decision making authority and responsibility but is not necessarily a member of top management; as such, this executive can experience substantial pressure to increase performance, possibly at the expense of ethics. In broad terms:

1. Each executive has an inherent level of personal integrity (top left area of figure) that is the result of influences and experiences while growing up, and subsequent experience

such as being mentored and/or formal ethics training. Higher personal integrity should lead to a higher level of ethical behavior.

2. Each executive has a personal level of risk taking ability (bottom left area of figure) that is shaped by age and seniority, personal financial stability, family flexibility, and the existence of alternative employment options. The greater the ability to take personal risks, the more the executive can stand up to pressures to engage in unethical behavior.
3. The ethics of the executive's external peers (middle bottom area of figure) provide a standard outside the firm against which the executive can compare personal ethical behavior. A similar comparison, of course, could be made by the media, thus facilitating ethics transparency.
4. Transparency counts; the more viable the media (middle bottom area of figure), the more likely that unethical behavior will be exposed, with possible sanctions including legal action and possible penalties. Transparency is a powerful force for raising the level of ethical behavior.
5. The intensity of competition, the pressures on the firm to produce performance, the time available for evaluation of alternatives and making choices, and the cost of more ethical choices (bottom and lower right areas of figure) put pressure on the executive to choose expediency over ethics.
6. The higher the firm's ethical climate (middle right area of figure) the higher the level of ethical behavior. The firm's ethical climate is shaped by its past ethics standards, current emphasis on ethics, ethics codes, and the ethics of the firm's leaders. The ethics of the firm's leaders are in part shaped by the societal culture's success measures, executive compensation, and industry ethics.

Figure 3 illustrates the complexity of systems that shape ethics behavior. Only some of the forces are shown; further expansion of the model could increase the level of detail, add additional forces, and show higher order relationships. However, the causal loop structure depicted here is sufficient to demonstrate the multiple factors affecting ethical behavior, and to suggest a number of ethical intervention points for improving ethics.

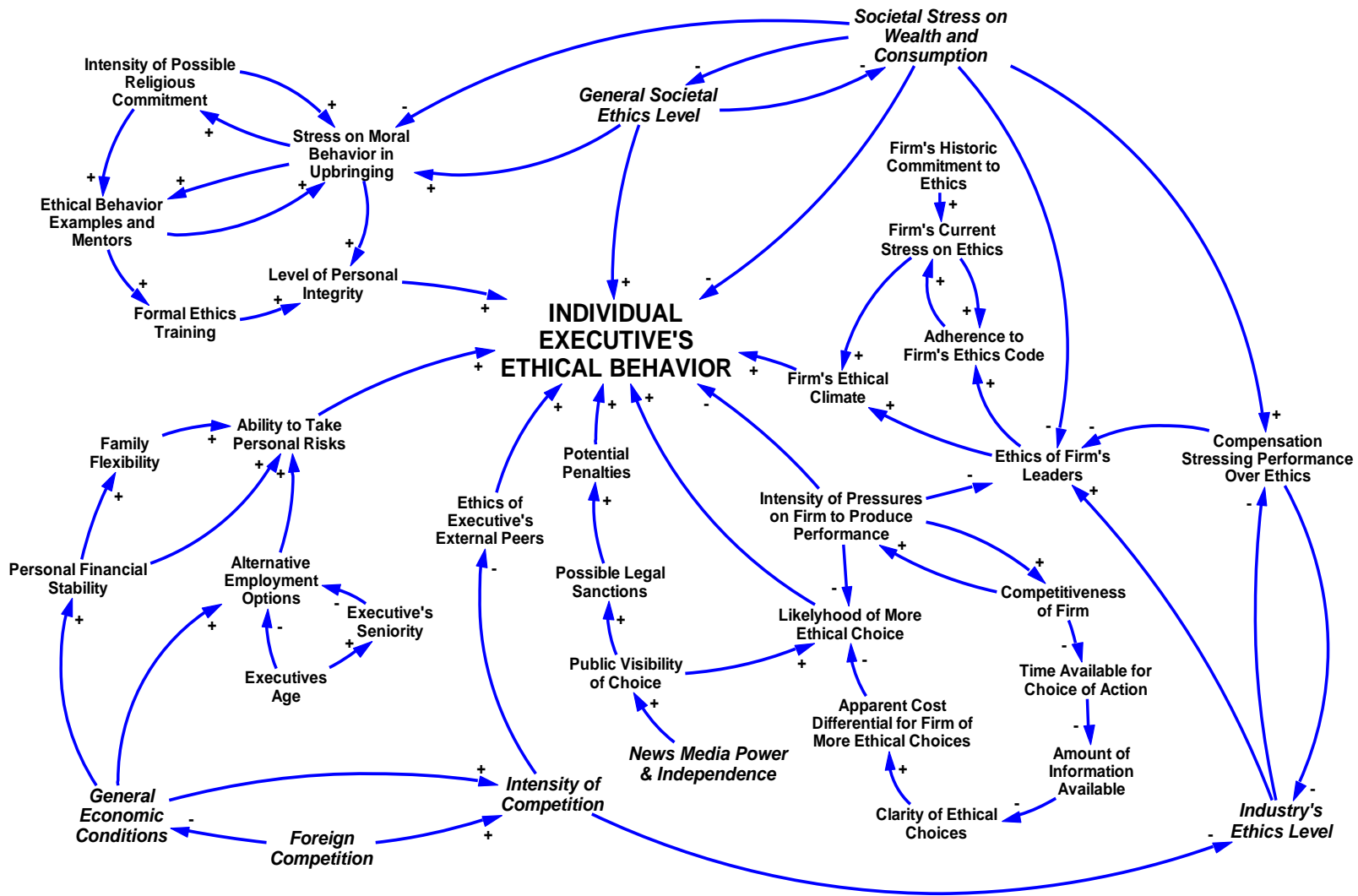


Fig. 3: Influences on an Executive's Ethical Behavior

Practical Application of Causal Loop Ethics Modeling

Our purpose was to illustrate how causal loop modeling can capture the complexity of systems of forces shaping ethics. Our efforts at this point are exploratory and not intended in any sense to be definitive. We chose to model business ethics, but we believe the modeling approach is broadly applicable to modeling ethics systems in general. We could have, for example, modeled government or medical ethics.

This modeling approach has both advantages and limitations. The models clarify the feedback structure of ethics force systems, and we know that failure to understand feedback in systems often leads to policies and decisions that produce counterintuitive results. The models demonstrate the complex causes of ethical shortcomings and identify possible multiple intervention points where ethical behavior can be influenced for the better. Most importantly, it gets us away from the simplistic thinking that one new law, one new rule, one revised ethics code, etc. will do the job.

But there are limitations. The relationships between variables are in the form of positive and negative influences; the relative strength of these influences and the time frames over which they are exerted are not included in the models. These forces are not static, but rather evolve over time. For example, moral character development during upbringing may in time be displaced by negative influences that lead to a subtle degradation of personal integrity. By comparison, pressure from top management to increase performance, possibly at the expense of ethics, is both more visible and more immediate.

Our models are based on some common-sense postulates, which we believe are adequate for demonstrating the generic modeling approach applied to ethics. However, policy makers and managers do not live in a generic world, but rather in a very specific world with very specific relationships. Ethics issues are frequently inherently ambiguous. Application of this modeling approach to specific circumstances requires the creation of definitive rather than illustrative models and thus a much tighter logical and empirical basis for model relationships than we used. These require the application of social, psychological, economic, political and other theories as well as empirical research on the particular circumstances of the specific system being modeled. Even then, substantial ambiguity is likely to be present. For those reasons, specific model creation must have clear goals for the effort, and is probably best done as a group process where relationships can be clarified through discussion. The modeling process itself, then, becomes an ethics education for the modelers!

In terms of examples of practical benefits, this modeling approach can help policy makers, managers, ethics theorists, and educators:

- Better identify the set of relationships that lead to ethics degradation,
- Develop policies and procedures to reinforce feedback loops that strengthen ethics,
- Design ethics training and education programs,
- Design ethics-friendly compensation and recognition structures.

It also should be noted that as society increases its focus on eco-friendly and sustainable systems, a great opportunity exists to include ethics models within the larger modeling efforts associated with studying sustainability and formulating appropriate policy.

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