A SYSTEMATIC APPROACH FOR DESIGNING AND EVALUATING IS EDUCATIONAL CASES ABOUT ETHICS

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Abstract

To date, very little research has been performed to help instructional designers, teachers, and researchers use a standardized process to develop cases that can be shown to be grounded in pedagogical goals and that can help these individuals measure the efficacy of a case's use in the classroom. This paper represents a first step towards that goal. In this paper, we present a systematic approach for designing and evaluating an IS educational case (and its use) about ethics. The approach begins by the teacher/researcher recognizing they are performing design science for learning (in our case about how to consider the ethics application domain of intellectual property), and therefore should become grounded in the Environment and Knowledge Base. In our case this led to use of a Typology of Problems in Learning which helped us understand the learning activities, inputs, contexts, success criteria and levels of abstractness vs. situatedness that were components of our dilemmas and decisions. Using the Knowledge Base also led to identifying inter-rater reliability indexes to evaluate our assessment of the case and our and the students' use of the case as well as to the development of 31 criteria that can be used by case teachers/researchers, as they develop and use cases in the classroom. We also use this systematic process to evaluate and demonstrate improvement from the first iteration of an example case to the next.

Keywords: Educational Case, Ethics, Evaluation Methods and Criteria, Decision-making, Design Science, Information Systems Research Framework

A Systematic Approach For Designing and Evaluating IS Educational Cases about Ethics

Introduction

Recently, many information systems (IS) educators have focused on developing cases for use in the classroom (e.g., White and Rea 2003; Wedel et al. 2004; Mitri and Cole 2007; Logan and Logan 2003; Jewels 2003; Ballenger 2003; Davis 2007). Given the importance of ethics to the IS community (Davison et al. 2006; Harrington 1996; Loch and Conger 1996; Malhotra et al. 2004; Mason 1986; Paradice and Dejoie 1991; Oz 1992; Peace et al. 2003; Smith et al. 1996; Smith and Hasnas 1999; Stewart and Segars 2002), one way to teach ethics to information systems students is via cases. However, little IS education research describes systematic attempts at how educational cases should be developed, used, and assessed. In this paper we describe our inductive and empirical efforts at developing a template process for developing, using, and evaluating educational cases and their use, and concurrently show a concrete instantiation of that process, including a sample case. However, our focus in this paper is not on the case itself, but rather on an approach that can help IS educators to more systematically design and evaluate educational cases, especially within the domain of information system ethics.

Our process in this research is founded upon, extends, and clarifies the design science paradigm in information systems research as described in Hevner et al. (2004). This paradigm details an approach that information systems researchers can use to create and assess artifacts and theories. According to Hevner (2004), IS researchers rigorously use foundational knowledge (e.g., theories, frameworks, instruments) as well as methodologies (e.g., data analysis techniques, validation methods and criteria) to iteratively develop artifacts and theories that address needs posed by people and organizations and their affiliated technologies. After artifacts and theories are developed and validated, knowledge is added to the literature and artifacts and theories can be applied in the environment. Our research is also founded upon, extends, and clarifies design-based [learning] research (Barab 2006) and the typology of problem solving in learning (Jonassen 2000).

In the first section of this paper, Motivation, we explain how Hevner's (2004) *Environment* construct can be used to show the motivation behind the development and use of a educational case. We describe *People* and *Organizations* that will benefit from this research, and we describe how the case described in this paper will be used in *Technology*, as we teach about technologies and their impacts upon and by people and organizations. In the second section, Background, we show how the *Knowledge Base* construct can be used, including the use of the case method and ethical theories. In the third section, Research Methods, we describe the interrelationships of the IS Research Framework (2004), design-based research in the learning sciences (Barab 2006), and a typology of problem solving in learning (Jonassen 2000), and then describe how we realized this integration through the process of deploying and evaluating cases and determined the reliability of our evaluation. In the fourth section, *Developing* and Using the Ethics Case, we explain our development and use of the specific case discussed in this paper. In the fifth section of the paper, *Evaluating* Ethics Case Development and Use, we discuss our evaluation of the case as well as our assessment regarding the reliability of our evaluation of the case. In the fifth section, Discussion, we share our suggested extensions and clarifications for the IS Research Framework as applied to design science (Hevner et al. 2004), design-based [learning] research (Barab 2006), and the typology of problem solving in learning (Jonassen 2000). We then describe the limitations of this research and how we plan to address these limitations in our future research. Finally, in the Conclusion section, we summarize the overall contributions of our research to the *Knowledge Base*.

Motivation

In this section, based upon Hevner et al. (2004)'s *Environment* construct, we describe the environment of IS educators, including the three components of *People*, *Organizations*, and *Technology*. We begin with Hevner et al.'s first component, *People*.

People

Here, we focus on the teaching role of educators of information professionals. The capabilities of educators include specialized knowledge in a research direction, knowledge about general practices in the application of information, information technology, and information systems in business (and other types of) organizations, and knowledge about how to help students acquire knowledge and skills both inside and outside of the classroom. A primary characteristic of these educators is the desire to help students learn knowledge and skills that are not readily available in a non-academic environment.

Students seeking to be (or enhance their acumen as) information professionals also have roles, capabilities, and characteristics. Roles include formal roles such as project team leaders and teaching assistants to informal roles such as one that is knowledgeable about the local community, and who serves as an aide for those who are new to the community. Capabilities of students that are studying to be (or increase their acumen as) information professionals include the ability to learn about how to develop, design, use, and manage information, information technology, and information systems. A primary characteristic of students is the willingness to accept and strive for obtaining, at least for the intermediate term, the knowledge that educators are trying to impart.

IS educators have recognized the need to help future (or current) information professionals and educators understand how ethical decision-making occurs (Thong and Yap 1998; Moores and Change 2006; Loch and Conger 1996). IS educators and students exist within and interact with other education-focused organizations. We now discuss these.

Organizations

Most educators of information professionals and students who will become information professionals are within business and other information-oriented schools. The structure of the schools includes a set of educators (i.e., faculty), a set of students who attend classes taught by faculty, and a set of staff who support both faculty and students. The primary processes that occur in this educational environment are the acquisition of knowledge and skills by students under the direction of faculty, the acquisition of knowledge by faculty who are conducting research, and the administration of the organization's support functions (i.e., re-accreditation) by faculty and staff. The cultures of the specific organizations vary, yet a common situation is that educators have much autonomy, yet are required to demonstrate rigor in research and effectiveness in teaching. An important process in the teaching/learning component of schools that teach information professionals is (re)accreditation. For business schools, this is provided via The Association to Advance Collegiate Schools of Business (AACSB). The Ethics Education Task Force to AACSB International's Board of Directors, in their report, indicated:

> "Most students, especially undergraduates, will not soon face, or be in the position to influence, situations such as the Tylenol recall or the Exxon Valdez oil spill. But almost all business people, regardless of their levels in the organization, face issues of potential harm and fairness on a regular basis; and preparing students for ethical decision-making should be a key component of the preparation of ethical business leaders" (AACSB International 2004, p. 12).

AACSB's Standard 15 (AACSB International 2003, p. 15) requires that undergraduate students have "learning experiences in ethical understanding and reasoning abilities." It further requires that in undergraduate and graduate programs "students learn about ethical and legal responsibilities in organizations and society" and "group and individual dynamics in organizations." AACSB's Standard 13 (AACSB International 2003, p. 14) requires that individual teaching faculty members actively involve students in the learning process, encourage collaboration and cooperation among participants, and ensure frequent, prompt feedback on student performance.

Another group that developed goals and standards for information ethics education was the Social and Professional Issues Knowledge Area Focus Group of the ACM/IEEE Computer Curriculum (CC) 2001 effort. Computing Curricula 2001 identifies and suggests many facets, of information ethics education, such as making and evaluating ethical arguments, identifying assumptions and values, and using moral philosophic theories such as utilitarianism or the Categorical Imperative (ACM/IEEE-CS 2001). It also discusses application areas such as information privacy and software piracy (see Table 1).

	Table 1. Prescriptions for Ethics Education	
	Prescription	**Source**
1	Students should develop ethical understanding.	AACSB Standard 15, 2003
2	Students should develop reasoning abilities.	AACSB Standard 15, 2003
3	Students should understand individual/group dynamics.	AACSB Standard 15, 2003
4	Students should learn to make ethical arguments.	ACM/IEEE CC 2001
5	Students should learn to evaluate ethical arguments.	ACM/IEEE CC 2001
6	Students should learn to identify underlying assumptions/values.	ACM/IEEE CC 2001
7	Students should learn to use moral philosophic theories	ACM/IEEE CC 2001
8	Students should learn about information ethics application areas.	ACM/IEEE CC 2001

Technology

Technology serves as both the content area and delivery mechanism for our larger project, which is funded by the National Science Foundation. In our larger project, we are designing and evaluating an educational simulation for information ethics, focusing on technology-oriented issues such as intellectual property, information privacy, computer networking, information quality, globalization, and information systems security. We are developing this systematic approach so that we can repetitively develop and assess cases so that our cases can serve as the content for our simulation. In this paper, we describe the design and evaluation of a case that will be the component in a simulation, and the structure of the case is directly related to enabling the case to be used in a multi-player and software agent-based educational simulation. However, this approach also has value beyond the incorporation of such cases into educational simulations. The ethics application area that is the target of the case in this paper is intellectual property.

Background

In congruence with the IS Research Framework's *Knowledge Base* construct (Hevner et al. 2004), in this section we argue how educational cases can help students receive, comprehend, value, apply, analyze, synthesize, organize, and characterize (Hevner 2004; Reeves 1990). In this section we also discuss ethical theories that can be used to consider an ethical dilemma, and which were used in the Information Ethics course.

Case Method

In this section we argue that, based upon the literature, it is appropriate to use the case method for teaching ethical decision-making. We are seeking deep conceptual understanding of ethical theories. Deep conceptual understanding is present when individuals can identify how and when to, and do, apply and adapt factual and procedural knowledge to problems in unique situations (Sawyer 2005). For deep learning to occur, learners must incorporate their knowledge into preexisting mental models. Learners must understand the structure of the new information as well as the previous knowledge in order to experience deep learning. Deep learning requires evaluation and understanding the effects of ideas. Experiencing deep learning requires examining arguments rigorously. Finally, deep learning occurs when learners are self-reflective (Sawyer 2006).

The case method of teaching and learning "enables students to discover and develop their own unique framework for approaching, understanding, and dealing with business problems" (Barnes et al. 1993, p. 42). The case method supports experiential, active, and collaborative learning (Heckman and Annabi 2006). Further, it supports teaching principles, concepts, morals, ethics, strategies, dispositions, and "images of the possible" (Shulman 1992, p. 3). Finally, the case method focuses on the situation, applies academic analysis to prescribe practitioner action, and involves students in the learning process. It helps students learn how to encapsulate the problem, see the inter-relatedness of organizations and processes, and take responsibility in their decision-making (Barnes et al. 1993).

The case method of teaching and learning is one form of project-based learning. Project-based learning is learning that occurs as students learn by doing. Three characteristics of project-based learning are active construction, situated learning, and social interaction. Active construction refers to the fact that students, not teachers, build their cognitive knowledge structures, as they "observe and interact with phenomena, take in new ideas, and make connections between new and old ideas" (Krajcik and Blumenfeld 2006, p. 318). The case method of teaching and learning supports arguing to learn. Arguing to learn is collaborative argumentation focused upon deep learning (Andriessen 2006). Arguing to learn allows students to reconsider their beliefs (factual and procedural) and how these beliefs are used. It does so by asking students to make tacit knowledge explicit. As students make this information explicit they can evaluate it given the new to-be-learned information. Further, since the information is now explicit, other students can suggest flaws in one's current knowledge.

Finally, Kerr et al. (2003) indicate that students playing roles in cases report that their learning is enhanced. Similarly, Huff and Frey (2005) outline how teaching with cases can support teaching practical ethics, and show that ethical decision-making is not rule-based, but instead uses metaphor, analogy, and narrative. Thus, using the case method can allow students to play different roles leading to different intuitions, provide bases for future analogies and metaphors, and allow "safe-but-realistic" practice.

Ethics

In this subsection, we describe the broad range of ethical theories included in the Information Ethics course prior to use of the case. These ethical theories span wide spectra in terms of both culture and time periods. We briefly describe each of these sixteen ethical theories (Virtue Ethics, Kantianism, Act Utilitarianism, Rule Utilitarianism, Social Contract Theory, Divine Command Theory, Islamic Ethics, Indian Ethics, Buddhist Ethics, Classical Chinese Ethics, Ubuntu, Rational Egoism, Ethics of Care, Subjective Relativism, Cultural Relativism, and Situated Knowledges).

Aristotle (350 BCE/1893) proposes the first form of a virtue theory of ethics. The person who is the most ethical is that person who is most self-realized using humanity's distinctive purpose (the ability to reason) to become the best that they can be. For ethical problem solving, this means acting in a way that best expresses the virtues (e.g., honesty, courage) that are most relevant to the problem at hand.

Immanuel Kant (1785/1981) argued for the concept of a *categorical imperative* which implies a respect for persons, in and of themselves. The categorical imperative has two forms: "One should act in such a way that one would be able to wish that all individuals would act this way." Alternatively, "One should treat all persons as ends within themselves, not just a means to an ends." This imperative is similar to the Golden Rule: Do to others as you would have them do to you.

Act Utilitarianism as advocated by Jeremy Bentham (1789) seeks the most good for the most people. Right or wrongness for acts is determined by the net positive or negative effect (consequence) on the general happiness of all people. John Stuart Mill (1863/1979) extended the concept by allowing happiness to have differing qualities and substance, suggesting that intellectual happiness, imagination, and feelings are higher in quality than, say, enjoying food and drink. Rule Utilitarianism (Berkeley 1732) prescribes that one should follow rules that are made on the basis that if they were followed by everyone, would lead to the most happiness for the most people.

Social Contract Theories are based upon the idea that moral rules exist and with us, form basic society, because without these rules, life would be "solitary, poor, nasty, brutish, and short" (Gert 1995, p. 369, citing Hobbes 1651). Rawls' (1971) Theory of Justice indicates that each person may lay claim to basic rights (such as freedom of speech) so long as these claims are consistent with everyone else having these same rights and social and economic inequality is only equitable when these are achieved by one when others could have reasonably done so and there is benefit to those least well off.

Divine Command Theory suggests that ethics is only valid via God's command, such that an action is morally wrong, right, or obligatory only if God commands it. Some Christian philosophers have argued its validity (e.g., Berkeley 1712). The Jewish Torah is replete with divine commands of ethics (Goodman 1995). Islamic Ethics has many forms, but one form, the *Shari'a*, based on the Quran and the Sunnah (the divinely and guided human life of the Prophet Mohammed) indicates five categories of moral acts: Obligatory, Recommended, Permitted, Discouraged, and Forbidden. One end of the command spectrum (e.g., giving property to orphans and the poor) is obligatory. On the other end of the spectrum acts such as murder and adultery are forbidden (Nanji 1993).

Ethics originating from Eastern Asia and Africa include, among others, Indian Ethics, Buddhist Ethics, Classical Chinese Ethics, and Ubuntu. Indian Ethics, and in particular Hindu Ethics, has a long tradition that includes the Vedas (canonical texts) as well as the concepts of dharma and karma. The Vedas "praise humanistic virtues and moral ideals such as truthfulness, giving, restraint, austerities, affection and gratitude, fidelity, forgiveness, non-thieving, non-cheating, giving others just desert, and avoiding injury to all creatures" (Bilimoria 1993, p. 45). Dharma is a very complicated concept but to a Hindu dharma can "suggest a form of life" (1993 p. 46) and this form of life's purpose is to "support, sustain, and hold together" (1993) "nature, society, individuals," (1993, p. 46) or other parts of the world. Dharma can mean "duty, right, justice, morality, virtue, religion, or good works" (1993, p. 46) as well as "norm, righteousness, and truth" (1993, p. 46).

Buddhist Ethics focuses upon an individual's happiness and an interest in humanity as a whole. Duties and obligations are important but so are virtues and vices. Duties are often prescribed when one plays a role in a social pair (e.g., husband/wife, teacher/pupil). Buddhism values virtues of conscientiousness, benevolence, and self-restraint. Buddhism sees ethics as covering all life forms, as opposed to the more Western focus on humanity. Finally, Buddhism also has proscriptions such as "abstaining from killing and hurting living creatures…wrong indulgence in sensual pleasures, [and] lying..." (De Silva 1993, p. 66).

Classical Chinese Ethics is very diverse and includes Confucius and philosophers who have interpreted Confucius, as well as others. Two concepts upon which Classical Chinese Ethics is based are *dao* and *de* (Hansen 1993). *Dao* can be seen as the ethical path, provided almost always from society to the individual. *De* refers to "traits, skills, and dispositions" (1993, p. 69) that are resultant from an exposure to or use of the *dao.* Chinese philosophers have differed on the appropriate *dao* in order to guide and develop one's *de.* Confucius and his disciples enigmatically prescribed understanding the roles in society, performing these roles and interacting with others in these roles superbly and in the right situations, and taking on more roles as necessary (1993).

Ubuntu is an African communalist philosophy that emphasizes the need for individuals to care about the needs of others and live in harmony with others. People are viewed as social beings, whereby their own existence and role in society is determined in relation to others and to the collective as a whole. While Western philosophical traditions usually focus on the autonomy and agency of the individual, Ubuntu instead focuses on the social role of individuals within their societies (Prinsloo 1998).

Contrary to the social focus of Classical Chinese Ethics and Ubuntu, Rational Egoism as formulated by Ayn Rand explains that the most moral thing any person can do is to rationally look out for their long-term self-interest, so that they may stay alive. Staying alive is a valued outcome, and morality is the use of values to guide choices and action (Smith 2006). Since actions that do not lead to keeping one alive necessarily lead to one's destruction, egoism (self-interest) is very moral and rational. However, Rand's form of Rational Egoism does not suggest that anarchy is appropriate, because that would not be the best result for many people. Instead Rational Egoism recognizes that other ethical theories (such as a recognition and protection of human rights) are appropriate and in everyone's self-interest. It does not validate hedonism, since pleasure and what will keep one alive are not always congruent.

Recently, fragmentary rationales from the benevolence or generosity tradition have been gathered in an interpersonally sensitive and responsive Ethics of Care. Instead of thinking only about rightness, wrongness, good or bad, fairness, or justness (i.e. universal, rational, static rules or justifications), Ethics of Care argues that a person takes actions that express experientially trained emotions and skills aimed at aiding (supporting and nurturing) others' well-being (Gilligan 1977/1993; Held 2008).

Relativism posits that right and wrong are not universal but rather are limited in some way. Subjective Relativism is the notion that individuals determine their own sense of right and wrong, and one individual cannot judge the rightness or wrongness of the actions of another. Cultural Relativism argues that right and wrong are culturally specific, and that an individual from one culture cannot judge the rightness or wrongness of the actions or beliefs of another culture. Both Subjective and Cultural Relativism are typically viewed as problematic due to the absence of an objective sense of right and wrong, making it impossible to develop ethical rules that span diverse individuals and cultures (Quinn 2006).

Finally, Situated Knowledges (Haraway 2003) holds that objectivity in the traditional sense is a God-trick that claims to see all but in reality does not exist and which is a social construction created by those in power and used to subjugate the subaltern. To avoid the difficulties of relativism, Situated Knowledges seeks to construct a new objectivity through a bottom-up view from below, asserting that the true reality is a social reality constructed by the sum of all of the perspectives of all individuals everywhere.

Research Methods

As discussed earlier, our most fundamental research paradigm is the IS Research Framework. This framework suggests that based on current knowledge, and in order to address a relevant business need, artifacts and theories are rigorously designed, developed, used, and evaluated. Subsequently new artifacts are available for use in the environment and new theories are added to the knowledge base. To actualize the IS Research Framework as we developed our educational case, we used Design-Based [Learning] Research.

Design-Based [Learning] Research (DBR) occurs in a real-world learning environment. DBR has many kinds of dependent variables. Many variables are identified during the study as opposed to prior to the study. Research procedures evolve during the study. There is much social interaction, particular between the researcher and the participants. The report of design-based learning research is focused upon reporting a design and the design of the research is influenced by the participants as well as the researcher. (Barab 2006, p. 157, Table 10.1) In order to apply DBR within the IS Research Framework as we designed our educational case, we used the developing Design Theory of Problem Solving to develop our educational case. This qualitative and quantitative DBR is framed from an action-research perspective. This design-based action research uses the case study research approach, in order to the study the use of the case method of teaching. Action research exists to solve actual problems while at the same time increasing knowledge (Baskerville and Myers 2004).

The theorized Typology of Problems in Learning describes the type of learning outcomes, inputs, success criteria, context, level of structure, and abstractness that apply for eleven types of problems that are used for learning. These include rule-using, decision-making, diagnosis-solution, case analysis, and dilemmas problems. We used the characteristics described in this typology to ensure that our open-ended questions considered diagnosis-solution and dilemmas problems as it created a case-based problem. We used the characteristics that describe rule-using and decision-making problems when we created our close-ended case-based problems. Specifically, we designed a case and implemented the case in two iterations of an Information Ethics class. The development and use of the case is discussed in more detail in the Developing and Using the Ethics Case section.

We used content analysis (Bauer 2000) to determine whether ethical theories were references by students as they considered dilemmas and made decisions. We employed inter-coder agreement indexes (often referred to as inter-rater reliability indexes). There are several indices that have been used by social scientists. Percentage agreement between or among coders, once used frequently in social sciences, has been shown to be too liberal in statistically summarizing inter-coder agreement (Cohen 1960; Kolbe and Burnett 1991). This is because it does not account for chance agreement between raters. Use of the chi-square test also is not appropriate because it requires non-zero frequencies to lie on the diagonal of a matrix that indicates two coders' agreements and disagreements, but does not consider frequencies on off-diagonal cells, and hence is too conservative. Cohen's kappa was developed to address both of these concerns but at times can't be computed (Grayson and Rust 2001). Perrault and Leigh (1989) developed an "index of reliability" that could be used for two coders and which built upon many commonly used reliability measures, such as Cronbach's alpha (1951), which itself integrated previous knowledge, and which addressed the deficiencies of previous indexes. Finally, Cooil and Rust (1994) have developed an index that is equivalent to Perrault and Leigh's index but can be used for agreement among more than two coders. We used Perrault and Leigh's index since we had two analysts. Our findings from the content analysis and inter-coder agreement for the case are discussed in the Evaluating the Ethics Case Development and Use section.

Developing and Using Ethics Case

In order to address prescriptions provided by the AACSB International as well as the ACM and IEEE, as described in our Introduction (and Table 1 above), we have created an educational case. The case was built based upon the design theory of problem solving (Table 2) from Jonassen (2000). This section represents the *Develop/Build construct* within the Hevner et al. (2004) IS Research Framework.

| Table 2. Typology of Problems Used in Learning					
	Learning Outcome	**Context**	**Input**	**Success Criteria**	**Abstractness vs. Situatedness**
Rule-Using Problems	Select and apply rules to produce system-constrained answers.	These occur in academic or "real world" environments.	Situation with constraints; Rules to apply.	Productivity measured as number of useful answers.	Need-situated.
Decision-making Problems	Identify benefits, risks, costs, and constraints. Weigh options. Defend choice(s).	These occur in normal life.	Situation with limited alternate outcomes.	Best choice given criteria and cost/benefit analysis across alternatives.	Personally-situated.
Diagnosis-Solution Problems	Select and evaluate treatment options; apply problem schemas.	These occur in the real world, are technical, and mostly are closed system.	Complex System with faults and numerous optional solutions.	Strategy used; effectiveness and efficiency of treatment; justification of treatment selected.	Problem-situated
Case Analysis Problems	Identify solution(s); Choose alternative(s); Defend choice(s).	These occur in educational contexts but simplify normal life.	Situation with multiple ill-defined goals.	Success criteria vary by context and type of problem.	Case-situated.
Dilemma Problems	Identify, consider, and balance several points of view.	These occur at the intersection of value domains.	Situation with antinomic positions.	Preference articulated with justification	Issues-situated.

As part of the larger project funded by the National Science Foundation, one of the authors developed and taught a new course in Information Ethics as part of the Master of Information Management program at [home institution name removed for double-blind review]. So far, the course has been taught twice, in the fall of 2007 and in the spring of 2008. During the first iteration of the course, ten cases were developed and used in the course. For the second iteration of the course, six cases from the first iteration were improved based on feedback received from students during the first iteration and were used again.

Students in both iterations of the course were exposed to ethical theories through class readings and discussions. In the first iteration, students read about the ethical theories discussed in the course textbook (Quinn 2006), including Act Utilitarianism, Cultural Relativism, Divine Command Theory, Kantianism, Rule Utilitarianism, Social Contract Theory, Subjective Relativism, and Virtue Ethics, and were given one-page handouts describing four additional ethical theories: Buddhist Ethics, Confucian Ethics, Ethics of Care, and Rational Self-Interest. Based on feedback received from the first iteration, the syllabus was broadened to spend more time on ethical theories up front in the course. (This was one of the reasons for decreasing the number of cases from ten to six.) Also, in the second iteration, book chapter readings were assigned for all four of the additional ethical theories from the first iteration. In the second iteration Rational Self-interest was referred to as Rational Egoism. Also, during the second iteration

Confucian Ethics was subsumed into a broader chapter on Classical Chinese Ethics that included Confucian Ethics. Four new ethical theories were also introduced via assigned book chapter readings during the second iteration of the course: Indian Ethics, Islamic Ethics, Situated Knowledges, and Ubuntu.

This section focuses on one specific case used to teach intellectual property in both iterations of the course. Both versions of the case were used to teach intellectual property and contain most of the same basic elements. For each case, class members worked in groups of three to complete the cases.

For the first iteration of the course, completing cases involved a series of specific stages. First, class members completed a brief pre-test. Next, students were randomly assigned to work in teams of three. Class members then selected roles to play as part of the case. Each role was faced with an open-ended scenario providing an ethical dilemma, followed by a closed-ended decision providing two to three different possible solutions to the ethical dilemma. Individuals playing the roles were asked to record the group discussion surrounding both the scenario and the decision, including identifying the ethical theories that could be applied. Each of the three roles proceeded in sequence, such that the decisions taken by the first role affected the second and third roles, and the decision taken by the second role affected the third role. Finally, each class member completed a post-test. The version of the case used in the first iteration of the course is detailed in Figure 1(a).

Figure 1(a) Intellectual Property Case (1st Iteration)
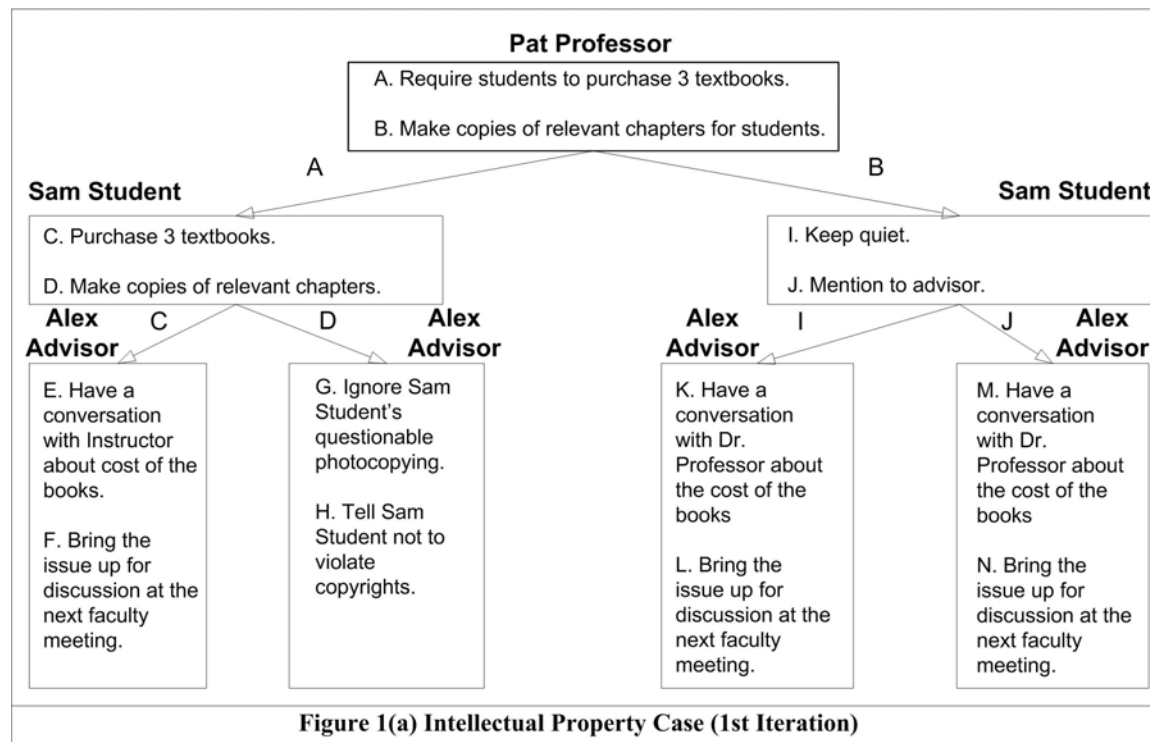
For the second iteration of the course, the case proceeded much as in the first iteration, with a few minor edits based on the learning experience and student comments from the first iteration of the case. Specifically, the names of the roles were made more generic, the pre-test was omitted, the class members worked in collaborative teams playing each of the three roles through consensus-building collective decision-making rather than assigned roles that made the final decisions (with class members evenly sharing recording duties), the sequence in which the roles participated in the case was affected by the first decision, and some of the specific decisions were revised or elaborated. The version of the case used in the second iteration of the course is detailed in Figure 1(b).

Our purpose in developing and using the cases was to support students actively applying the ethical theories presented in class. The learning activities we were interested in providing are described in the first column of Table 2. We wanted students to identify solutions, make choices, and defend choices.

Figure 1(b). Intellectual Property Case (2nd Iteration)
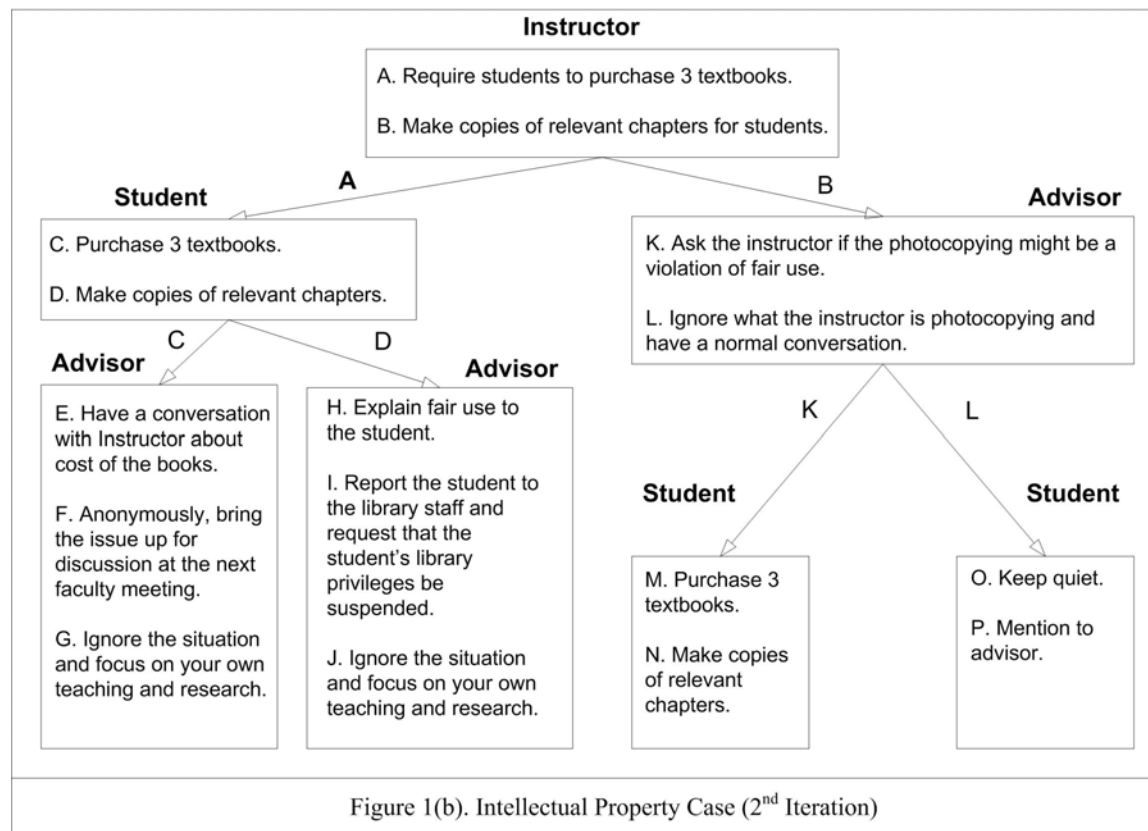
We wanted them to consider multiple approaches (ethical theories) when they considered open-ended dilemmas. However, we wanted the case to be decision based so that the interdependent nature of decisions in ethical decision-making in organizations could be shown. Also, since we plan on using this case in a technology-based learning environment, we also were interested in developing a case that could be embedded within software; hence the limited options and a tree-shaped interdependence structure of decisions.

The "inputs" (see Table 2) that were used by students as they considered our case (in the first stage of each of three role-based cycles) were multiple, unclear goals and antinomic approaches (the theories previously presented in the semesters). The inputs in the second stage of each cycle supplemented the inputs from the first stage with explicit alternatives that student(s) playing a role would need to choose between or among. Similarly, the amount of structure in our case in general was small. In the case of the initial dilemma in each role-driven cycle, multiple but finite approaches could be used. The decision faced by each role had multiple but finite criteria to be used when choosing between/among alternatives. The context of our case in general, the dilemmas, and the decisions, are meant to be simplified representations of normal life that show the crossing points of ethical theories. Success for each dilemma and choice occurs when students explicitly use the ethical theories we provided.

Evaluating the Ethics Case Development and Use

We used content analysis to determine what ethical theories were references by students as they considered our open-ended and close-ended problems. The results of the analysis are shown in Table 3. Note that in the first category of ethical theories (items 1-8) the number of references in relationship to suggested options for resolving dilemmas and for supporting the choice of an alternative in a decision increased to some degree overall, but decreased for use of three ethical theories (Kantianism, Rule Utilitarianism, and Subjective Relativism). We do not have a verified explanation for this decrease in use, and this is a topic for further research, but we cautiously hypothesize that this is the result of students having too many theories to consider in tandem. Note that in the second category of ethical theories (items 9-12), overall use and use for each ethical theory increased by greater than a factor of three. We hypothesize that this is related to the more complete coverage of these areas, including more in-

depth readings. Note that the new theories introduced in the second iteration of the course were used to some degree. Overall, it is significant to note that even for the first eight ethical theories alone, progress was made from the first iteration to the second iteration, which is even greater when considering the four additional theories covered in both iterations. Also, it is notable that the total number of ethical theories including all sixteen theories is much larger in the second iteration than the first, which is notable considering that the same amount of time and space was allotted for both. Overall, these results, while quite preliminary, are still encouraging, and suggest that we were able to make positive improvements to both the course and the case between the two iterations.

Table 3. Counts of References to Specific Ethical Theories over Two Semesters' Cases					
		References	**Counts**		
		Ethical Theories	**Fall 2007**	**Spring 2008**	**Change**
Fall 2007 Lecture Coverage	**Spring 2008 Lecture Coverage**	1. Act Utilitarianism (Quinn 2006)	2	4	2
		2. Cultural Relativism (Quinn 2006)	0	1	1
		3. Divine Command Theory (Quinn 2006)	0	0	0
		4. Kantianism (Quinn 2006)	5	3	-2
		5. Rule Utilitarianism (Quinn 2006)	5	3	-2
		7. Social Contract Theory (Quinn 2006)	0	5	5
		8. Subjective Relativism (Quinn 2006)	1	0	-1
		Subtotal 1	**13**	**16**	**3**
		9. Buddhist Ethics (de Silva 1993)	0	0	0
		10. Classical Chinese Ethics (Hansen 1993)	0	0	0
		11. Ethics of Care (Held 2008)	2	7	5
		12. Rational Egoism (Smith 2006)	1	3	2
		Subtotal 2	**3**	**10**	**7**
		13. Indian Ethics (Bilimoria 1993)	0	1	1
		14. Islamic Ethics (Nanji 1993)	0	0	0
		15. Situated Knowledges (Haraway 2003)	0	3	3
		16. Ubuntu (Prinsloo 1998)	0	1	1
		Sub Total	**0**	**5**	**5**
		Total	**16**	**31**	**15**
		Inter-rater Reliability Measures			
		Cohen's (1960) Kappa	.93	.93	
		Perrault and Leigh's (1989) Index of Reliability	.97	.97	

In addition, the inter-rater reliability measures returned quite high values, demonstrating that the two coders were able to independently reach the same conclusions most of the time, which further validates this data. Errors in inter-rater reliability that did occur are believed to be the result of different definitions of the scope of the ethical theories, different rules of thumb about how to disambiguate references to utilitarianism that did not specify act or rule utilitarianism, and failing to identify a reference to an ethical theory. As a result, we have modified our coding approach to clarify and improve our approach on each of these issues, so we assume that we will be able to achieve even greater inter-rater reliability results in future analyses.

Figures 2(a) and 2(b) show the two iterations of the case. One type of information that is shown is the ethical theories that are referenced as individuals consider dilemmas and make choices between/among alternatives. The other type of information is what paths were (and were not) chosen by the students. Note the number of references for any particular dilemma/decision on Figure 2(b) is greater in general than in Figure 2(a). Also note that in Figure 2(a) the teams took two different paths, while in Figure 2(b) there was one path that was chosen by both teams, independently. Figures 2(a) and 2(b) provide more detail about the data provided in Table 3.

Figure 2(a) Intellectual Property Case (1st Iteration)

Pat Professor

A. Require students to purchase 3 textbooks.

B. Make copies of relevant chapters for students.

Act Utilitarianism
Kantianism
Rule Utilitarianism

Sam Student — A

C. Purchase 3 textbooks.

D. Make copies of relevant chapters.

Kantianism (2)
Rational Egoism
Rule Utilitarianism (2)

Sam Student — B

I. Keep quiet.

J. Mention to advisor.

Not chosen

Not chosen

Alex Advisor — C

E. Have a conversation with Instructor about cost of the books.

F. Bring the issue up for discussion at the next faculty meeting.

Alex Advisor — D

G. Ignore Sam Student's questionable photocopying.

H. Tell Sam Student not to violate copyrights.

Alex Advisor — I

K. Have a conversation with Dr. Professor about the cost of the books

L. Bring the issue up for discussion at the next faculty meeting.

Alex Advisor — J

M. Have a conversation with Dr. Professor about the cost of the books

N. Bring the issue up for discussion at the next faculty meeting.

Ethics of Care
Kantianism
Rule Utilitarianism
Subjective Relativism

Act Utilitarianism
Ethics of Care
Kantianism
Rule Utilitarianism

Figure 2(b) Intellectual Property Case (2nd Iteration)

Instructor

A. Require students to purchase 3 textbooks.

B. Make copies of relevant chapters for students.

Act Utilitarianism (2)
Ethics of Care
Kantianism
Indian Ethics
Rational Egoism
Rule Utilitarianism
Situated Knowledges

Student — A

C. Purchase 3 textbooks.

D. Make copies of relevant chapters.

Act Utilitarianism (2)
Ethics of Care (3)
Kantianism
Rational Egoism
Rule Utilitarianism (2)
Siituated Knowledges
Social Contract Theory (3)
Ubuntu

Advisor — B

K. Ask the instructor if the photocopying might be a violation of fair use.

L. Ignore what the instructor is photocopying and have a normal conversation.

Not chosen

Not chosen

Advisor — C

E. Have a conversation with Instructor about cost of the books.

F. Anonymously, bring the issue up for discussion at the next faculty meeting.

G. Ignore the situation and focus on your own teaching and research.

Advisor — D

H. Explain fair use to the student.

I. Report the student to the library staff and request that the student's library privileges be suspended.

J. Ignore the situation and focus on your own teaching and research.

Cultural Relativism
Ethics of Care (3)
Kantianism
Rational Egoism
Social Contract (2)
Situated Knowledges

Not chosen

Not chosen

Student — K

M. Purchase 3 textbooks.

N. Make copies of relevant chapters.

Student — L

O. Keep quiet.

P. Mention to advisor.

Discussion

The case that we developed and our use of the case we developed can be compared to criteria suggested in the literature (Table 4). Our case and our teaching followed these criteria. We provide three concrete examples below, after we discuss the criteria in general. Based upon the cognitive apprenticeship, anchored instruction literatures, and her study of the history of the case method's use in medical, legal, and business education, Williams (1992) suggests 14 criteria for educational cases and their application (Table 4, Items 1-14). The instructor that used these cases (a co-author) did model ethics problem solving, provide immediate feedback (coaching), assistance (scaffolding), and suggest ways to control ethical theory/framework choice. The case was used in seven discrete components; this allowed the instructor and the students to assess the effectiveness of the learning. More formal assessment happened as students completed post-tests, which could be compared to pre-test answers to identical questions. Also, students wrote solutions and selected decisions during the execution of the case; this information was used by the instructor to facilitate discussions, based upon her/his assessment of the progression of the case. Also, the use of pre/post tests in combination, using open-ended questions allowed students to be very descriptive as they indicated their knowledge of an ethics application domain or theory/framework.

Stepich et al. (2001) prescribes five coaching strategies (Table 4, Items 15-19). Hackney et al. 2003 suggests four additional (Table 4, Items 14, 15, 20, and 21) Our students were able to identify underlying issues, structure the issues, consider multiple factors, consider multiple perspectives, and evolve their answers. Our students did consider consequences and implications, develop high-order reasoning skills, and think about organizational impacts, social values, and ethical issues. Keefer et al. 2005 suggests four more case teaching criteria (Table 4, Items 22-25) while Loui (2005) complements these with three additional suggestions (Table 4, Items 25-27) and Law (2007) adds four more (Table 4, Items 28-31). We required students to make decisions, which encouraged self-reflection. In terms of learning outcomes, our cases were tied to helping students navigate ethics application areas (e.g., intellectual property, information privacy), and were created to enable students to apply ethical theories. Our cases were discussed by the students, and in the semester, roles were played by creating consensus (i.e., collaboration). Our cases were "chunked" into small pieces that were able to be considered from multiple perspectives. Finally, we attempted to be sensitive to student needs, levels of knowledge. By providing multiple approaches, with no "one right way," we empowered students to use the means they felt appropriate. Finally, since these were collaborative exercises, students had opportunities to learn from other students.

The approach to developing cases that we present in this paper is based on these criteria, which can be roughly divided into teaching-oriented, student-oriented, and case-oriented criteria. In terms of teaching-oriented criteria, following criterion 14, our approach uses realistic cases that are based either on our own experiences or on data from a separate research project by two of the authors funded by two grants from the National Science Foundation. Following criterion 22, our approach requires students to make decisions at the end of playing each role. Finally, as in criterion 26, we pose our cases in "bite-size" pieces, giving students more of the scenario as they go, with each component of the case being approximately one paragraph in length. Through following these recommendations for teaching, we are able to convey a large amount of complex and realistic information in a way that students can quickly understand, identify with, and use as the basis for decision-making.

Our approach to developing cases is also student-oriented. For example, following criterion 13, students are required to actively engage in problem solving, as they must collaborate to discuss problems and then either individually or collectively determine solutions. Further, students are given the chance to, following criterion 18, play various roles, and the decision made by one role then automatically affects the dilemma faced by subsequent roles. Similarly, following criterion 19, students have the opportunity to consider potential consequences and implications, as they immediately see the consequences of the first two decisions as they shape the dilemmas faced by subsequent roles, and also at the end of each case, students are asked to consider the ultimate outcome of their choices and the broader implications for each of the roles that they played as well as potentially for others. Clearly, students use complex problem solving from a variety of roles and with careful attention to the consequences of ethical decision-making.

Finally, there are several important case-oriented features of our approach. Following criterion 7, the problems that students confront are indeed realistically complex, as the interpersonal interaction among students playing different roles that make different sequential decisions is a good simulation of the actual way that information professionals confront ethical dilemmas and their consequences in their careers and lives. Clearly, following criterion 18, the cases draw upon ethical issues as well as social values and organizational impacts. In addition, there are multiple steps to solve a problem within each case, as each role is first tasked with considering all possible solutions and then

	Table 4. Criteria for Evaluating Case	
	Criteria	**Source**
1	Does the teacher model expert problem solving in the context of a complex problem?	Williams 1992
2	Does the teacher provide specific immediate feedback while the students are solving problems?	Williams 1992
3	What type of scaffolding is used to support students as they solve problems?	Williams 1992
4	Does instruction emphasize meta-cognitive strategies as well as domain knowledge?	Williams 1992
5	Are there frequent opportunities for both teacher and students to assess how well learning is progressing?	Williams 1992
6	Is the type of assessment used appropriate for measuring the skills that are taught?	Williams 1992
7	Are the problems realistically complex?	Williams 1992
8	Are the problems presented in a way that makes complexity manageable?	Williams 1992
9	Are problems sequenced to support student's needs at different stages of learning?	Williams 1992
10	Are there multiple steps necessary to solve a problem?	Williams 1992
11	Are the settings rich and detailed?	Williams 1992
12	Are multiple skills and concepts linked to each problem?	Williams 1992
13	Are students given the opportunity to engage actively in solving problems?	Williams 1992; Hackney et al. 2003; Loui 2005
14	Teachers should use authentic cases.	Williams 1992; Hackney et al. 2003; Keefer 2005
15	Students should have the opportunities to "spot" the underlying issues and principles in authentic, relevant problems.	Stepich et al. 2001
16	Students should have the opportunities to practice framing problems.	Stepich et al. 2001
17	Students should have the opportunities to consider multiple factors in tandem.	Stepich et al. 2001
18	Students should have the opportunity to see multiple perspectives from various roles, and be allowed to evolve their solutions.	Stepich et al. 2001
19	Students should have the opportunity to consider potential consequences and the implications these might have.	Stepich et al. 2001.
20	Does the case allow students to develop high-order reasoning skills?	Hackney et al. 2003
21	Does the case draw upon organizational impacts, social values, and ethical issues?	Hackney et al. 2003
22	Teachers should require students to make decisions.	Keefer 2005
23	Teachers should encourage self-reflection.	Keefer 2005
24	Teachers should connect cases to specific learning outcomes	Keefer 2005
25	Teachers should use collaborative learning.	Keefer 2005; Loui 2005
26	Teachers should pose cases in "bite-size" pieces.	Loui 2005
27	Teachers should adjust presentation of material based on students.	Loui 2005
28	Teachers should motivate students to seek out new knowledge and skills according to their needs	Law 2007
29	Teachers should structure learning so that it is amenable to various levels of student knowledge	Law 2007
30	Teachers should structure learning so that students are empowered to use alternative means to complete tasks.	Law 2007
31	Teachers should provide opportunities for students to learn from other students solutions.	Law 2007

required to make a choice about which solution to adopt, and further, all three roles must solve different parts of the same overall problem. Thus, our case-based approach not only incorporates complexity, ethical issues, and multiple steps, but more broadly, it encompasses teaching-oriented, student-oriented, and case-oriented criteria.

Limitations

Only a small number of students participated in this study; five students (plus the instructor) participated in this case during both iterations. While we used six cases in both of the iterations, in this paper, due to practical constraints such as space, we only report findings from one of these cases. We had different and non-randomly selected students in each semester. In the future, when we perform studies like the one described in this paper, we plan to use a more structured and rigorous research design, and hope to recruit many more students to participate in the class and the cases. For example, we may use the split-class design and the now-and-later design. We also are aggressively seeking to teach this course at additional colleges and universities, in order to seek a much larger number of participants.

Conclusion

To date, very little research has been performed to help instructional designers, teachers, and researchers use a standardized process to develop cases that can be shown to be grounded in pedagogical goals and that can help these individuals measure the efficacy of a case's use in the classroom. This paper represents a first step towards that goal. In this paper, we have presented a systematic approach for designing and evaluating an IS educational case (and its use) about ethics. While we have applied this approach to develop and evaluate a case about ethics in an information management graduate program, this approach should work for other educational cases, as long as the educational cases have firm pedagogical goals that can be measured. The approach begins by the teacher/researcher recognizing that they are performing design science for learning (in our case about how to consider the ethics application domain of intellectual property), and therefore should become grounded in the *Environment* and *Knowledge Base*.

In our case this led to use of a Typology of Problems in Learning which helped us understand the learning activities, inputs, contexts, success criteria and levels of abstractness vs. situatedness that were components of our dilemmas and decisions. It also led us to use content analysis to understand what happened in the classroom as the case was used. In our case, this was student reference to ethical theories as they defended their consideration of dilemmas and choices in decisions. Using the *Knowledge Base* also led to identifying inter-rater reliability indexes to evaluate our assessment of the case and our and the students' use of the case. It also led to the development of 31 criteria that can be used by case teachers/researchers, as they develop and use cases in the classroom. We used part of the systematic process to evaluate and demonstrate improvement from the first iteration of the case to the next. Finally, besides contributing to the *Knowledge Base* information that can be used to develop a standardized approach to case design and delivery, this effort also developed and assessed an instantiation of a case that can be used in an educational simulation for ethics education that is being developed by the authors and funded by the National Science Foundation.

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