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Murder One - Developing Interactive Simulations for Teaching Law

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Electronic technology has provided stunningly little in the way of improvement in education. Though loudly welcomed, television, teaching machines, cassette players and the like have been of minor utility in formal education. Thus chastened by the history of the technology, we set out in 1984 to attempt to make the computer useful to the learning of that which lies at the heart of learning law: the mental process vaguely referred to as "thinking like a lawyer". We innocently set out to do more with computerized instruction than drill and test for the acquisition of legal facts.

Our general strategy was to use the computer to present the student with a factual scenario about a legal dispute that raised hard questions, questions that do not have a single, clearly correct, answer. The program would guide the student through the case, identifying hard questions and requiring the student to take a position on them, then testing the student's comprehension of that position by, for example, confronting him or her with the implications of the choices made. Where the student made a choice that was clearly wrong, that would be pointed out and the student returned to the path of the truly problematic.

We developed and delivered these tutorials on a network of Macintosh computers, using an authoring system that we developed for ourselves (a copy of which is available free of charge). We found it necessary to develop the authoring system for two reasons. First, we wanted a system that could be easily learned by students. From the outset we wanted students to learn by using the tutorials and by creating their own, which they have done over the years by the hundreds. Second, we needed a system that would make it easy for the author to ask hard questions, questions with more than one plausible answer, having implications that propagate like wildfire in many directions. In computer terms, that propagation calls for "branching" -multiple pathways that proceed in parallel. The human mind has only limited ability to keep track of those branches. By having the computer keep track of them the author's mind was free to proceed along as tortuous a path as the problem called for.

Our efforts were successful enough to convince a largely skeptical faculty to adopt computerized tutorials as a central part of the first year curriculum. We developed LITEX, short for "litigation exercise", in which the entering student was put into the role of a lawyer handling a tort case. He or

she met and interviewed the client via the computer, gradually digging out the facts of the case as the semester progressed by interviewing lay and, later, expert witnesses. LITEX became the basis for assignments in the first year courses, for research into negligence and products liability law in Legal Skills, for the preparation of pleadings, motions, and trial briefs in Civil Procedure, for analytical papers in Torts. The aim was to put the student's learning in the perspective of the job that he would do as a practicing lawyer and to integrate the course material. Our surveys indicate that students overwhelmingly appreciate that aim and conclude that LITEX does accomplish it.

LITEX and the other tutorials that we use convey information to the student through written characters graphics. Law, with rare exception, being largely verbal, means that most of the time the student is reading words from the screen. That is an activity that most people find tedious, so an effective tutorial will have a minimum number of words and a maximum number of opportunities for the student to make choices. Still, the medium is artificial, its ability to create a realistic sense of law dependent upon the student's imagination and willingness to devote mental energy to the medium.

This weakness has led us to look for more realistic ways to convey information - the term "artificial reality" captures our aspirations. For lawyers, real reality largely involves talking with people. We looked for a way to simulate conversation at a level that would allow even those without supple imaginations to relate to the computer as if to a real person. That has proved to be a complicated task. The program that I will describe below is but a first step toward a realistic simulation of human interaction.

Murder One places the student in the role of an assistant district attorney charged with investigating a case of first degree murder and taking it to trial. As with the tutorials described above, the student gathers facts by questioning the witnesses to the incident. With ***MurderOne,*** however, the witnesses are represented by line drawings of real people. The witness's responses to questions propounded by the student are in spoken language, digitized from human statements, rather than made in synthesized computer talk. Each character's face moves in sync with the speech, creating what is a fairly convincing approximation of a person talking.

This is, of course, multimedia technology, mixing the media of digitized speech and animation. At first the development of ***Murder One*** was driven by these techniques, so that we adopted a pretty unexciting murder case that had already been thoroughly tested. As we began to see it emerge, however, we began to sense that this technology could create more than a computerized simulation of a canned student exercise. Were we up to the task, it could create a simulation of a real case, complete with dead ends, conceptual swamps, and logical traps. The technology pointed us at reality. To create a convincing emulation of the murder trial that ends ***Murder One,*** we let the student choose the questions that he or she wants to propound at trial from among those to which he or she has received answers during the investigation of the case. The student chooses the order in which the witnesses will be called and the order in which questions will be presented. At trial, an opposing counsel will object to some of the questions propounded by the student and the student must choose the correct rejoinder or face exclusion of the testimony.

Central to the dynamics of ***Murder One*** is the time clock. The student has seven thousand time units within which to investigate and prepare the case for trial. At the expiration of that time, the student will be sent to trial and, if the case is not ready, his case dismissed. Each event in the case has a time cost. The student must choose his or her actions judiciously, for there is far more information in the simulation than the student can discover in the time available.

The efficiency of the student's use of time is included in the scoring. At the end of the trial the jury will render a verdict based upon the probity of the case the student has made - the greater the probity of the evidence that the student has succeeded in introducing into evidence, the greater the likelihood that the jury will render a prosecution verdict. Beyond the verdict, ***Murder One*** tells the student the probability of getting a favorable verdict and renders an efficiency rating that combines the

probability of victory with the amount of time the student used.

Creating ***Murder One*** required close collaboration between four people: the law professor who uses the case upon which ***Murder One*** was based in her trial advocacy class; a programmer who developed the tools needed to implement the program; a graphic artist to do the drawings; and a law professor (this author) who facilitated the process and did the many ancillary tasks that that thejob required. All told, about 1200 hours were spent creating ***Murder One,*** though if we were to do the same task today it would take considerably less than half that time.

The first step in creating ***Murder One,*** as in any multimedia production, is the creation of a "functional specification". It sets out the intent of the program and describes it from the standpoint of the user as it will eventually function. The initial intent of ***MurderOne*** was to teach the student the rules of evidence by having him or her conduct a computerized trial. Our intent began to expand, however, as we decided to put the trial in a realistic setting. To do that we decided to let the student investigate the crime and prepare the case for trial. Our aim became the creation of a program that would show the student the flow of a murder case from initial investigation to trial.

The second step is writing the script, which contains both the spoken dialog - the questions that the player will be allowed to ask, the answers that the characters will give to those questions, and the unsolicited statements that various characters will make - and the logic that will govern the flow of the program. The two parts of the script call for vastly different talents in their authors. Dialog is best written by people who have actual experience with the thing being simulated and a good ear for realistic conversation. The logical flow of the program, by contrast, calls for people who have the imagination to visualize the program as it plays out and the grit to work through, what is in law, remarkably complex logical twists and turns.

It is essential that the people involved in these two aspects of the script work closely. This is by far the most difficult part of the process of creating something like ***Murder One***. It cries out for simplification, which one can see in ***Murder One*** in the lists of questions that the player must choose from to elicit information from the characters. That is not, of course, the way that actual conversation works, but it was a simplifying strategy that we hit upon to manage complexity. In our work since ***Murder One*** we have been able to make the interaction between the student and the characters in the story more interactive without getting lost in logical complexity.

The third step in the process is production. It involves several components, some of which may be done in parallel. The script will generate a list of scenes that must be created, showing the characters in various situations. With the list of scenes in hand, we chose the people who would play the characters in the story and took photographs of them against the backgrounds called for by the story. The graphic artist then made drawings from the photographs, scanned them into the computer, and polished them. Each character had to be made to "speak", which required the artist to create a number of drawings of the character's face, which could then be matched to the spoken statements.

Running parallel to the creation of the graphics, the statements made in the script were spoken by humans, recorded on audio tape, and digitized into the computer. Once this step has been done, changes in the script are exceptionally tedious, for they require that each new statement be recorded by the same person who initially made the statement, at the same levels and under the same acoustical conditions, then substituted into the program.

With the graphics and recorded statements in hand, the two are merged through the animation process. This involves coordinating the graphics of the character's face - the face is the only part of the graphic that Is animated in ***Murder One*** - with the spoken statements. There are a few commercial programs on the market that perform this function, but we found them inadequate for a variety of reasons and wrote our own animation program using HyperCard.

With the ingredients for the program in band, the final step is to glue them together with the computer program. The program is most easily thought of as a set of instructions that tell the computer what to put on the screen in response to an action (or "event", in programming lingo) by the person using the program. Each screen gives the user a variety of options, each one of which will result in a different screen. Programming consists of creating the instructions that govern the sequence in which the screens will be presented.

In any legal program the logic that determines what happens when the user makes an action will be highly conditional. That is, a given event will have one effect under one set of conditions, a different effect under another set of conditions. It is the ability of the computer to respond differentiy to the user depending upon what the user has already done in the program that makes it possible to mimic reality. We take it for granted that the success of a trial motion, for example, will depend upon the affidavits that we have been able to provide to support it. The computer can implement that conditionality, changing the likelihood of success on a motion, depending upon the information that the user has discovered in the case.

One of the difficulties in developing a computer program, as compared, for example, to writing an essay, is that there are so many steps between the initial concept and feedback from the implementation of that concept. Where only minutes may separate the writer's idea from the realization of that idea on paper, months separate the ideas of those who design a simulation from its realization in a running program. Were the human imagination more powerful, it might be that the program that emerged from production was identical to the image that its creators intended. Such is never the case. With ***Murder One*** it took three months of polishing to bring the running program into some approximation of what we intended.

At that point ***Murder One*** made made sense to us, its creators. But where the intent is to create a program that is a convincing simulation of reality, it is hardly sufficient to satisfy oneself. The final step was to see whether it made sense to anyone else. We tested it with law students, law faculty, criminal science undergraduate students, and assorted others. We included in the program a feature that recorded the results that each person who ran ***Murder One*** achieved. These records and the subjective reports of the users showed us bugs that we had never noticed, advised us of assumptions the we had made about the users that were not accurate, and indicated where ***Murder One*** was least convincing. This feedback enabled us to fix the worst of the problems and to plan a follow-on program based upon a different way to simulate the process of investigation and trial.

The response to ***Murder One*** has been positive enough for the law school to support further development of this medium. The dominant response to it has been that it is instructive and fun; the possibility that learning law might be fun, and that the fun of it could enhance learning, has generated considerable excitement. It appears that rather than substituting for other types of learning, ***Murder One*** adds a type of learning that is otherwise absent: learning by discovery. The dominant modes of legal education - the Socratic method, however modified, and clinical education - guide the student carefully through the material. Clinical education has the virtue of being realistic, but since real people are involved students cannot be let free to roam and discover through trial and error. Classroom education is efficient at covering a body of material, but errors in that setting are very poorly regarded.

The very impersonality of a computer simulation is its strength. It responds indefatigably to error, giving the student endless chances to redeem himself. And it presents some approximation of realism, confronting the student with an actual legal task without risking the rights of real people.

Where is this technology headed? The underlying computer technology is now at a point where anyone who can afford a $2000 personal computer and $1000 in audio recording and digitizing equipment, can be a producer. The difficult part is assembling a team with the set of talents necessary to the task. Four people executed ***Murder One*** in the interstices of otherwise busy

schedules over the course of ten months; today we could do it in four or five months. These resources are not beyond the reach of most academic institutions. The development process is itself highly educational, which further fits it to academia. And schools are full of people who have the bits of supporting knowledge that are needed and are willing to act as characters in the cast of the production.

Law provides an endless source of rich material. The litigation process is itself a treasure trove, but at least as compelling would be a simulation of a treaty negotiation, a corporate takeover attempt, a real estate development, a settlement negotiation, a labor arbitration, or a technology transfer deal. Law resides in a structured interaction between humans. The computer can embody that structure and generate a simulation of human interaction compelling enough to create in the willing user a close experience of law itself.

If the resources are available and the subject matter is inexhaustible, is there a demand for simulations of this sort? I think it is clear that there is an underlying demand for them, first exposed to me while having dinner with my brother and his family. I mentioned, as you might imagine, that we were working on ***Murder One*** and that I had a primitive version of it on my computer. In the middle of the night I heard some noise in my study and went to investigate. My nine year old nephew had been working away at ***Murder One*** for many hours. The full trial was not implemented on the version that he was working on, so, try as he could, he could not tell whether or not he had gotten a conviction. The noise that woke me up was his fist banging on the desk as, time after time, he got one of those dumb computer messages when he had been hoping to have the judge tell him whether or not he had won the case.

Legal controversies have a primal meaning that most people find gripping. By putting the controversy first, a computer simulation can grip the student's mind in a way that putting the laws first cannot. Simulations can provide the student an intuitive sense of the legal process that then becomes the grist for formal study. They can provide a context for laws, revealing, for example, why it is that the rules of evidence are as they are. Finally, if they are compelling enough, they can extend an understanding of law to non-lawyers, enhancing, one might expect, their performance as citizens, producers, and parents.

There is, I suspect, an underlying demand for compeliing legal simulations that extends far beyond law school. To translate that underlying demand into market demand, however, will require development. Because of the recorded voices, ***Murder One*** is a large program, almost twenty megabytes. The standard form of software delivery, the floppy disk, will not do, for it would take at least thirty standard disks to do it. The alternative delivery modes are a CD-Rom disk or a hard disk. Any institution of any size can afford the cost implicit in these media, but most individuals cannot. For that reason the present market for legal simulations is largely institutional. That places several strictures upon the developer, for the product must fit into an already existing institutional framework. For a product aimed at legal education that is not difficult to do, but that market is very small. The entire thrust of computer technology is, however, in the direction of delivering large multimedia productions. File compression technology, CD-Rom and CDI players, broad band data transmission and so on will before long make trivial the delivery of legal simulations. Such, at least, are our conclusions as we evaluate ***Murder One*** and plan future development.

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