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H3C 3J7

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Courriel : themis@droit.umontreal.ca

Legal Information, Open Models, and Current Practice

Tom BRUCE*

* Cornell Law School, U.S.A.

A broad-based, ongoing exploration of legal-information territory is taking place worldwide. It has revealed new features of the terrain it was intended to explore, and there are differing opinions about what ought to be built atop the new electronic legal-information terrain, and how, and by whom. The exploration I refer to is, of course, the publication of legal information via the WorldWideWeb, an Internet-based distributed hypertext system whose primary features are its open architecture and its inexpensiveness for both information consumer and information provider. The bulk of my remarks in this paper have to do with what that experiment has revealed to us about the nature of ultimate success for this ongoing experiment, some obstacles which may stand in the way, and the way in which various institutions might act to overcome them.

Statistics

Statistics which purportedly capture an image of the chaotically expanding Internet often obscure more than they illuminate. Still, there is little doubt that something of major proportions has been going on for the last few years. Roughly three years ago the Legal Information Institute built the first Web site dedicated to legal information (and, incidentally, one of the very first sites outside the physics community). There are now roughly one hundred and fifty legal-information servers, the bulk of which are in the US but with significant collections quickly being built elsewhere. As with everything else on the Net, that word « now » is a kind of trick : by the time you read this — a month or more after it leaves my word processor — there will be many more.

New sites are appearing at a great rate. For the past several months, in the US at least, the greatest growth has been in sites offered by government agencies and by the private sector, in the form of legal publishers and law firms. There was a time when those of us who are evangelists for this new medium would have considered that rate of growth an enormous success in itself — and in fact we still do, tempered by the realization that if we pat ourselves on the back each time a new site appears we will develop some sort of repetitive stress disorder. But popularity is only one way to measure success, and skeptics are quick to suggest other dimensions along which that success might not appear so great. « Very well », they say, « but is there anything of substance there ? Who’s using this stuff ? Isn’t the technology out of reach for most people ? How will anyone be compensated for providing information ? » Evangelist or skeptic, a series of questions remains, and in the end it comes to this : how will we know when this experiment has succeeded, if it does ? What ought we to be seeking in a useful, public realm of electronic legal information ?

I. WHAT IS TO BE DONE ? NECESSARY CONDITIONS FOR AN EFFECTIVE LEGAL-INFORMATION CYBERSPHERE

Those same skeptics might assume that the reason we welcome new Web sites is that each new one is in effect an endorsement of our own impeccable judgment in undertaking the experiment in the first place. Despite what you may have heard, computer geeks are human, and there's no doubt that in this case our vanity is being fed from the same plate as our evangelistic principles. But there is also the belief that each new site brings new information and so brings us closer to some goal of comprehensiveness.

A. Comprehensiveness

Just how important is comprehensiveness ? One can argue that as a goal it is a kind of relic drummed into our heads by the marketing claims of online service providers, and sustained by the outmoded belief that information access rather than information selection is our overarching aim. There are certainly many realms in which non-comprehensive collections are every bit as useful as those which claim to be complete ; one imagines having access to the personal library of an expert, for instance, and realizes that sometimes value is added through informed exclusion. We might ultimately prefer a realm which is selective rather than comprehensive.

On the other hand, comprehensiveness is, in the minds of practitioners at the very least, the great virtue of the traditional online services. Nobody, least of all a lawyer, wants to be surprised later by law they didn't find. But this is not the only argument in favor of a comprehensive realm, even if one is not concerned with the needs of practitioners. Those of us who are building this new realm need to consider the here-and-now requirements of those authors who wish to build expert commentary on a foundation of other texts, texts which are somehow more « basic » in that they contain less added value. We might base our argument on the well-worn analogy of hypertext link as electronic footnote. From that standpoint, print authors writing footnotes in ink at the moment enjoy a considerable advantage over their hyper-counterparts. At the stroke of a pen, they can reference information in the reasonable expectation that the reader will have access to it through a library or other large print collection. Our electronic systems have not yet got this kind of assumed breadth, and the author of hypertext often finds himself wanting to deepen original material with hyper-references only to find that in the words of Dorothy Parker, « there is no there there ». This suggests that not only is an appropriately-concealed comprehensiveness a good thing, but that there is an order in which we ought to approach it, a point to which I shall return later.

B. Navigability and resource location

Comprehensive collections have their drawbacks. They necessarily confront the user with that much more to hunt through when he wants something specific. There is no better demonstration of this than the Net today. Considered as a

whole, it looks rather as though someone had gone through the Library of Congress and carefully removed the bindings of the books just before the whole place was leveled by a cyclone. We need to be able to find things, and right now we can't, at least not very well. There are a number of ways to bring that goal in reach.

Technological solutions to the resource-location problem get all the attention of computer enthusiasts, and some are fairly well developed. Though at the present there are not yet any full-text-searchable, distributed catalogs which span legal-information sites, there very soon will be ; the software is freely available and it is simply a matter of various sites cooperating to implement them. There are issues involved in building these so that their varying scopes are both meaningful and understood by end users, but this is an area in which librarians and academics have a great deal of experience (perhaps too much, in fact). The widely-touted « intelligent agent » technology is much further from realization, and may encounter the same intractable problems which have dogged natural-language recognition and other applications of artificial intelligence (AI) to information retrieval.

There are ways to skin this cat using a different kind of « intelligent agent ». Librarians, bibliographers, treatise-writers, and others who have traditionally provided organizing value for print materials can and do continue to do so in the electronic environment (though in far fewer numbers). Indeed, at the moment it seems that automated resource-location systems are most useful when they are used to do a « first cut » which is then editorially refined and annotated by someone who has substantive expertise in the law and experience in organizing information for the benefit of some particular audience. Much harder, at least in US law schools today, is developing the collective will to bring these electronic cataloging and organizing activities into the mainstream of institutional life. We have, over the course of many years, mobilized significant institutional resources to help us find things in print, and we understand and to some extent reward the activities of those who help us do that. No such broad mobilization of human resources has yet taken place with respect to electronic materials, though a few exceptions (largely constructed by enterprising individuals with or without institutional endorsement) can be found.

C. Standardization versus diversity

As with so many things, solutions breed new problems. We would like to have comprehensive collections, but this sets us the extra task of making things locatable within them and, ultimately, of changing some of the activities and reward systems of our institutional culture. The conflict between our twin goals of comprehensiveness and ease of information location is not the only such dilemma. A similar dynamic exists between our goal of offering access to as many people as possible and the equally important goal of presenting information to them in a way which is consistent with their expectations and relevant to their needs — a problem of standardization as an aid to navigability versus diversity of audience. This problem gets considerably more complex when we consider

questions of who in this distributed galaxy of legal-information providers will offer what, how they will offer it, and how we will avoid duplication of effort in an arena where there is no one player with sufficient resources to undertake the whole task.

The one thing which is certain is that the audience for legal information — including information about government and its activities — is far larger than anyone imagined prior to the current explosion of Net use. It goes well beyond the population being serviced by online providers, well beyond the bounds of that group we think of loosely as « law people ». In it are people with and without experience in our legal system, inside and outside the private sector, sophisticated and naive. At the most abstract level this is hardly surprising ; when one thinks of the number of people touched in some way by law and government, and the number and diversity of those connected in some way to the Net, it's not surprising that the overlap of those two groups contains many different kinds of people with many different kinds of needs.

But this is not an abstract problem ; the widely varied audience recorded in the log files on our Web server at Cornell shows that it's a very real one. We are doing two things which are targeted specifically at problems of audience diversity. The first is our use of alternate forms of organization, expressed as topical indexes or tables of contents, to guide three different kinds of audience through our materials : law people (lawyers, legal academics, and law students), non-lawyers, and lawyers from civil-law jurisdictions. We are also directing a fair amount of effort at the construction of so-called « context information » for each major category of legal information we either offer ourselves or point to elsewhere on the Net. You might think of these as legal encyclopedia entries intended to orient a mythical « man from Mars » and provide some understanding of where in the legal universe various collections of information may fit. We do not pretend that they meet the needs of all of our audience all of the time ; we do not possess the kind of extrasensory perception required to anticipate those needs. And it is frightening for a single provider to imagine all the effort needed to provide all of the necessary editorial and organizing value for even a modestly comprehensive collection in a single substantive area.

Fortunately, we need not service all those needs from a central source. The technology is inexpensive, and at least from a technical point of view there are few barriers to entry by new providers. Moreover, distributed hypertext allows us to link together material from any number of providers in a way which is more or less invisible to end users. The question is one of how we will ensure that this diversity of providers, each of which is servicing one facet of a highly diverse audience, can all obtain the informational raw materials they need. Alternatively, if we retain a model in which there are exclusive sources of supply for some information, how can we guarantee that these sole-source providers will service the needs of all who come to them for information ? In the past, our approach to diversity of perspective in legal information has been reminiscent of Henry Ford's remark about the Model T : Customers can have any color they want as long as it's black. The new technology permits much, much more.

Ultimately, practical and scaleable methods for providing context and organization will depend on the fact that no one provider need service all audiences. The interconnection of information no longer depends on its springing from a single source. We need to encourage a diversity of information providers sufficient to understand and provide for the needs of as many segments of a hugely diverse audience as we can. Many in the US[1] believe that this can be done by simply staying out of the way of those who would become such providers and letting the market take its course. Not surprisingly, this view also implies a great deal about the proper role of government, about which I shall have more to say in a moment.

D. Open architecture

Assume that we abandon any notion of exclusivity among providers in this new realm. This has its problems too. Consider the experience of a hypothetical user approaching (perhaps during a single interlude in cyberspace, and perhaps with a single informational goal) a wide variety of sources offered by a wide variety of providers. The user will expect that the means of navigating and searching that data — indeed, that the kinds of things which *can* be searched for — will be relatively uniform from collection to collection. There is both good news and bad news here.

The good news is that, thus far, both the architecture and interface offered by the WorldWideWeb have remained relatively free of proprietary extensions and that the standards which dictate the inner workings of the system are not shrouded by intellectual-property protections. Everyone is free to develop clients and servers which will interoperate and indeed many are doing so. The bad news is that this happy situation is continually threatened for reasons both good and bad. I say « good » reasons because there will always be an interval of time in which worthwhile innovations remain proprietary ; one developer has done whatever it is and the rest haven't[2]. This is quite normal and even expected on the Net, and whatever its disadvantages as an approach it is probably superior to the stultification which takes place when committees attempt to fully map standards in advance[3]. As to bad reasons, there are of course information providers who are not yet capable of doing the new market calculus which comes with this environment. These providers believe that proprietary interfaces and

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1 Especially Professor Henry Perritt of Villanova; see the excerpt from his report to the Office of Management and Budget at « http://www.law.vill.edu/Fed-Agency/OMB/pub.info/ombtoc.htm ».

2 This does not mean, of course, that the author approves of the level of corporate arrogance with which such innovations are customarily announced. Neither, apparently, does the rest of the Net audience. Corporations such as Netscape Communications which have repeatedly used this tactic now seem to be at some pains to assert that they are good guys with deep respect for standards. It may also be that this kind of good citizenship is much easier now that it is apparent that there is no money to be made in the browser market.

3 As evidence I offer the International Standard Organisation (ISO) standards process, which while both comprehensive and representative went for 14 years without producing a full implementation of the specification and is, for all intents and purposes, a dead nag at this point.

access systems will permit them to « lock in » market segments. There are a number of factors that they disregard at their peril. First, end users simply won't put up with a wide variety of interfaces and access systems once they have a need to access a number of information sources. They don't want to use one interface for legal information, another to read the newspaper, and a third to buy groceries. Second, we are rapidly approaching a point where end users will see isolated collections of information as fundamentally flawed ; this is already true to some degree in professional markets and is basically another expression of the goal of comprehensiveness. Finally, providers who « lock in » some end users will inevitably « lock out » others. At a point when nobody has a true picture of the extent of the global market for any particular type of information, this seems at best short-sighted and at worst crippling.

E. Making the strange familiar

The user's experience of the medium is not limited to interface, of course, or to the architecture by which information reaches them. The underlying architecture of the information itself is important too. For example, if I can search a collection of opinions offered by the University of California based on the name of the judge involved, I ought to be able to do that at Cornell, too. And if the statutes and regulations published electronically by the State of Indiana are divided up into separate hypertext « chunks » on a section-by-section basis, the State of Ohio ought to do likewise. We are a very long way from developing agreement on these sorts of standards, though there are some encouraging signs. The most notable of these is the effort underway in the United States to arrive at a system of vendor-neutral, media-neutral citation. At least one other deserves mention, an effort to standardize the representation of legal text in which the lead is being taken at the University of Cincinnati along lines suggested by the international Text Encoding Initiative (TEI)[4]. While this is quite a recent enterprise, it is a promising one ; it involves a great deal of very necessary spadework which would be needed as the basis of any standardization effort regardless the ultimate standard used to capture it.

F. Technology and compensation

One of the pillars on which the legal cybersphere will be built is simply a guarantee that those who build it will be compensated for their work in some way. Without getting into the merits of particular schemes, or of the legal regimes needed to perpetuate them, let me simply say that this is an absolutely critical factor and one for which both technology and administrative apparatus are just beginning to emerge. It is critical because we already have information-quality problems ; for too long, we have expected too much from volunteers.

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4 Like the rest of TEI this is essentially an effort to construct an SGML Document Type Definition (DTD) which will preserve the full range of value represented in a legal document.

We are about to up the ante. As collections cease to be isolated from one another, as we move toward some level of standardization and navigability, we will inevitably expect extra effort from providers. We will be asking them to build collections in ways which go beyond their immediate purposes to service the requirements of a larger, and at the time perhaps unknowable, community. A low-key but important example of this is the need for hypertext authors to structure points of entry (link targets) into their collections which go beyond those necessary for access from their own collections ; others will wish to link to them in the future, very likely in different ways and at finer granularity than they can immediately envision. Providers will need incentives to undertake this extra work. Thus far, the only such incentive is peer pressure working toward some hypertextual notion of perfect penmanship. Though this may evolve into marketplace competition based on informational and organizational quality, there must first be a marketplace where money is changing hands.

That compensation need not follow old models. We need not necessarily charge by the byte, by the minute spent online, or by the search launched against a text database. Other models (such as subscription and sponsorship) may prove successful. There are, or soon will be, well-accepted ways of doing all these things, though one difficulty remains. As we move further into the hypertextual soup, it seems inevitable to me and to others that the granularity of the text being bought and sold will get smaller and smaller ; we'll be buying paragraphs and pages, not books. At the end of that road lies a situation where the value of the goods being sold is actually smaller than the transaction cost of collecting the fee. Some work on the apparatus which would make such « microtransaction » systems viable is underway, but it has some distance to go.

II. ROLES : WHO WILL DO WHAT AND WHY ?

My comments on the current state of the art and our aspirations for a public realm of legal information hint at important roles to be played by different actors in the public, academic, and private sectors. A few years ago, Henry Perritt pointed out that distributed information systems have the effect of « unbundling » different types of value to be added by these various actors. As a practical matter, this means that no one group or organization need undertake all of the value-adding processes which are important to a high-quality legal-information regime. One group might simply issue content, another provide organizing value ; still others might add editorial value of different kinds, and yet one more might market the whole thing. There is a diversity of potential roles for individual actors which reflects and interacts with the diversity of content needed to serve various markets. The legal-information economy as we will know it will be generated from this combinatorial explosion.

Any examination of roles in this new world, then, is ultimately a debate about who is, or can be, well situated to add different kinds of value, and to undertake the initiatives sketched earlier. It may also be a debate about which aspects of traditional practice in legal-information distribution ought to be eliminated as counterproductive in this new arena ; in fact, it is likely that the new ways of doing

things will only be valuable if some actors give up doing things they have done in the past.

With all that in mind I propose to offer a few thoughts about the respective roles of academics, practitioners, publishers (both traditional and otherwise), and government.

A. The role of academia

When Peter Martin and I began our joint enterprise three years ago, we envisioned the Legal Information Institute as an entity which could enter into partnerships with the private sector and with government in much the same way that (for example) engineering schools have done for the last forty years or more. Our vision was a hazy one ; at that time nobody involved (or potentially involved) had much of an idea what any of the partners would have to offer the other. Three years later, we have a much clearer idea of what legal academia can bring to the table.

Of all the different populations contained under the general label « law people », academia is currently the best source of leading-edge expertise about the various aspects of Internet technology which would be useful to both providers and consumers of information. This is probably less true than it was a year ago, and probably more true than it will be a year from now, but for the moment the academic law schools in the US and elsewhere have a decided lead over their counterparts in the private and governmental sectors. Maintaining this lead will require that they bring research and development efforts in this area into the mainstream of institutional life both in terms of programmatic resources and in terms of integration with existing activities. There are a few places where this is happening, among them Cornell and the University of Montreal, and the reservoirs of expertise about the technology and about the process of bringing legal content to the Net are potentially very valuable to partners in private practice, publishing, and government.

These are new and frankly unusual activities for law schools, to be sure, but new and unusual initiatives are not the only ways in which academia can be of value. Law schools are and have always been formidable repositories of other kinds of expertise as well, and their faculty and students can be great sources of editorial and organizing value, including treatise-like orderings of particular substantive areas and commentary which runs much deeper than that we now get from traditional online services. Two new undertakings at Cornell illustrate this proposition. The first has a group of students providing commentary and context for the opinions of the New York Court of Appeals. Within four days of the opinion being handed down, subscribers will receive via e-mail a syllabus of the opinion, together with commentary which includes discussion similar to that found in law-journal case notes. The second such « enterprise » is the offering of a court-statistics service built by two professors atop data received from the Federal Judicial Center, accompanied by papers the two have written based on the same database.

Finally, law schools are capable prototypers and experimenters. Like their counterparts in engineering and the sciences, the professors, students, and technologists found in law schools can quickly and creatively generate proof-of-concept information products in ways and at high speed and low expense, when they can get their hands on the raw materials needed to build them. The proof of this is the legal-information sector of the Net as it now exists, in which efforts by academic institutions far outpace those of other actors.

This is not to say that legal academia provides a solution to all problems, despite what law professors may believe. Academic institutions are capable and nimble prototypers, but they lack the resources to maintain large collections consistently over long periods of time. As in other disciplines, they are best used to rapidly generate inexpensive research prototypes which are replaced by production efforts housed elsewhere — a process which frees academics to generate more, perhaps radically different prototypes, a smorgasbord of models from which others may choose. There are other functions best left to those others ; marketing is one which comes to mind immediately and about which I shall have more to say in a moment.

B. The role of practitioners

Practitioners initially appeared on the Net as information consumers. Most who have gone further have done so as a way of marketing their respective firms. It is the nature of that marketing which is interesting, however, since properly done it can represent much more than a cyber-billboard.

Firms, like law schools, are formidable repositories of expertise. The need to market that expertise provides a powerful motivation to showcase it — and this can in turn generate real contributions to the information available to the public. Some firms may regard this as « giving away the store », but others have found it a powerful way to attract clients, by providing tangible proof of expertise in a particular area in the form of expert commentary freely delivered. Implicit in all such offerings is, of course, the idea that if the reader wants or needs more she should hire the firm. For some firms, too, these cyber-offerings show a kind of solidarity with their clients. For example, an intellectual-property firm might well put material on the Net, in effect opening a branch office in cyberspace just as they might open a branch office in a major city to which clients had moved operations.

Firms also have the problem of making good their investment in knowledge which was developed at the behest of particular clients in particular circumstances, a kind of intellectual inventory which has never realized its full market potential. The Net, with its diverse and continually growing population, provides a way to do this, if only that population can be made aware that the product is available. This may well prove to be the most powerful motivator for firms as information providers in the future, though it is some distance from being realized. A precursor of this kind of activity is visible in the Lexis/Counsel

Connect service, which essentially makes marriages between corporate and outside counsel for these purposes.

Firms, I suspect, will be slower than most to step into a providers' role, in part because of a tendency to treat all knowledge as proprietary. Too, it is difficult to imagine a worse environment in which to undertake research and development than in a partnership structure which bills by the hour[5]. But this is the Net we're talking about, and there is no need for firms to undertake this effort themselves ; I have already pointed out that academics can fill the research and development role quite nicely.

C. The role of publishers

And what of those who have traditionally done all these things in print and on central computing systems, the publishers ? Some confusion about their role is inevitable, simply because Net technology is radically changing our ideas about who is a publisher and who is not. Indeed, this is probably the most important motivation for this group right now : the fact that if they don't contribute to this new realm they'll be left out.

Publishers clearly have much to offer in the form of large, well-organized and maintained collections of content, deep knowledge of « pre-press » processes and procedures, formidable quality control and marketing expertise. (Indeed one might argue that they have an old-dog-and-new-tricks problem in this respect). At the moment they are not adept with the various new technologies involved, but that is changing rapidly and ultimately we will be able to expect wide if shallow offerings from them. In short, they are potentially a powerful source of raw content for our new legal-information realm, but they need help, too.

Publishers like West or Lexis/Nexis are near the headwaters of a very wide stream of information — so wide, in fact, that it is practically impossible for them to deepen all of it uniformly. They cannot, ultimately, compete with providers of deep editorial value in narrow niches. It would be a mistake for them to try, since to do so they would have to employ every substantive expert on the law for the next ten years. Yet at present their marketing philosophies and rate structures do not really permit them to be upstream providers for those who can successfully function in these narrow niches. To do that they will have to reconceive themselves as being (at least part of the time) wholesalers rather than retailers, and it is not clear how willing they are to do this. Concentrated as they are on lawyers as their most important customers, they have also been slow to perceive the size of the potential market on the Net. This is certainly one area in which the experience of academic institutions can serve as a guide. Needless to say, those same academics and lawyers can also serve them as sources of editorial expertise, or, as I have hinted, take on a role as retail resellers.

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5 There is no better evidence to support this contention than the history of viable expert systems in the realm of tax law. Successful adaptation of this technology took place entirely under the auspices of accounting firms.

D. The role of government

Government information on the Web is, from one point of view, a fairly new thing. To be sure, there have always been US Government agencies on the Net ; it did, after all, have its origins as a project within the Department of Defense. There are very good sources of Federal information which have come to the Net within the last year — and also some very bad ones used primarily for hypermedia grandstanding. This latter category of server contains the sort of smile-and-a-shoeshine material epitomized by the White House Web server, which sports the digitized meows of Socks, the First Feline. It seems to be all the rage for agencies to put up a page or two with illustrated personnel rosters and audio clips in which the Secretary of Whatever tells you that you stand at the dawn of a new era and hopes you'll have a nice day. At the other end of the spectrum are services offered by the Securities and Exchange Commission (SEC), by the Library of Congress, and by the National Library of Medicine, genuinely deep and useful sources of information.

Why this unevenness ? At the abstract level, everyone seems to agree that relatively free flow of information from the government is a good and even vitally necessary thing. Broadly speaking — very broadly, for I am no expert in the law — this philosophy seems to flow from a long-standing American belief that the business of government ought to be done in public, and that the taxpayers have some right to information which in some sense they have already purchased. The most direct and visible efforts to put this philosophy into action are the various ways in which the work of Congress is now made available electronically, from searchable databases of bills in process to archives of the public laws. Similar efforts exist at the state level in a few states as well. There are also reasons which are far more pragmatic. Some agencies have mandates and missions which require that information be placed before the public ; others are in effect marketing government and its activities to others. Perhaps the most interesting examples of this latter practice is found not in the US but in Eastern Europe, where governments interested in encouraging foreign investment are electronically publishing trade laws as a kind of weather report on their favorable business climate.

There are obstacles which vary from place to place within government . First, there is a lack of technical expertise. It is somewhat revealing that the White House server is in fact operated by a NASA lab ; one presumes that there was nobody on the White House media staff who could do it. This problem will, of course, disappear as agencies and others acquire the necessary personnel, or as electronic publishing initiatives are concentrated as a sort of new Government Printing Office, or as government acquires other partners to act in this role.

Second, there are many agencies which derive significant revenue through more conventional publication of internal knowledge bases. This seems to be especially true of the state court systems in the US. These potential providers fear the erosion of those revenues if competing products are offered, and are reluctant to enter into non-exclusive agreements with newer kinds of providers, feeling that such deals would jeopardize their existing relationships. It would

seem that some of this reluctance would vanish were they to understand that the new markets potentially offer far greater revenues. This has been a difficult case to make, but it is getting easier as the size of the potential market becomes clear to even the most reluctant.

Finally, it ought to be clear from the opening discussion that a rising informational tide will not necessarily float all boats uniformly. There is simply too much diversity of government information and of the audience which wants it, and it would be impractical to expect a single source of supply, even one with the resources of government, to be all things to all people. Indeed, the court-statistics project undertaken by Eisenberg and Clermont at Cornell demonstrates this proposition. Precisely because it cannot be all things to all people, the Federal Judicial Center (FJC) issues annual reports which contain prepackaged summary information derived from the overall database ; presumably the prepackaging represents the FJC's notion of a manageable subset of the kinds of summaries most people want. By contrast, the Cornell interface permits the user to make his own judgments about which summaries and slices will be useful. At the same time, it records each query in a way which would permit one to figure out which kinds of queries are in fact the most popular, rather than relying on prejudgment, arbitrary decisions, or guesswork.

None of this is meant to suggest that pessimism is the order of the day. In the US, these problems are by no means uniformly encountered across the government landscape. The best way to describe Federal offerings in general is « spotty », with some low points and some high points as well. Some agencies — such as the Social Security Administration and the National Technical Information Service — have long histories of data publication and sharing which are either an explicit part of their mandate or have been found to benefit them in other ways. Others, such as the Securities and Exchange Commission, are gradually moving their primary operations to data-based systems with the intention of making them widely accessible. The SEC's EDGAR database has been a terrific success in this respect — not only serving its users, but spawning a variety of « aftermarket » providers who link its information with other sources to produce new and useful things. The keyword here is again « variety » ; EDGAR tapes are available to all comers at a price ; no exclusive arrangements with « retailers » are permitted.

CONCLUSION

And that, I think, is the crux of the matter when it comes to considering the future role of government among the various other actors involved. I am a great believer in government as a wholesaler of information ; I don't believe it can be an effective, exclusive retailer if we are to meet all the needs outlined at the beginning of this paper. There is certainly no doubt that government is at the headwaters of a great many information streams — too many for it to service fully by itself. The raw material generated by government is at best a wholesale product, which needs the added editorial and organizing value provided by

academia, practitioners, and publishers if it is to be genuinely useful to an international public.

People network computers out of a belief that collectively we can do more than we can individually, and that no-one need lose by cooperation. This is not some dewy idealism ; there are working models of these cooperative arrangements in place now. There are logical and complementary roles for academic, private, and public-sector organizations to fill. We can do a great deal toward building a system which meets all the requirements outlined in the first section of this paper if we simply allow each to do what it is good at without granting exclusive fishing rights in any stream.