Expanding Citizen Access and Public Official Accountability through Knowledge Creation Technology: One Recent Development in e-Democracy

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Abstract
The authors describe an addition to the conversation regarding enhanced democracy through technologically-assisted means (e-Democracy) focusing on enhancing and expanding the typically unidirectional flow of statutes and procedural documentation from government to individuals. A new knowledge creation application is described that significantly improves the utility of available public records and enhances the ability of citizens to use them to ensure better and more consistent governmental outcomes. The application, called Minutes-n-Motion, uses neural net search algorithms to create multidimensional knowledge cubes inserted into a user-friendly interface to allow user-defined structuring of public information. The application improves access to public records and allows users to evaluate public actions in details from multiple perspectives with relative ease, thereby improving public official accountability and both the fairness and the consistency of the public process.

1. Introduction
The conversation surrounding the technologically-enhanced interaction between government and its citizens (e-Democracy) is emerging as one of the richest public debates today. The opportunities for enhancing citizen participation in the democratic process are great, but so are the dangers. Just as technology can make it much easier for individuals to vote, comment on public issues, and actively shape their local government’s policies, it can also open the door to fraud, invasion of privacy, and unscrupulous manipulation of the public process. Several states are entertaining discussions about internet-based voter registration and perhaps even e-voting. [1] Others are considering video and precinct-level electronic voting machines that would then provide results electronically to central registrars.

The concept of e-Democracy typically centers around three threads: (1) technologically-enhanced voting methods (e-Voting), (2) technologically-assisted public dialogues and debates (e-Testimony), [2] and (3) technologically-assisted information sharing. This analysis will focus on the latter of these threads, focusing on how government informs the citizenry of its choices, actions, and processes.

This area of e-Democracy is the least developed of the three threads. Information shared in public records serves several purposes. First, it is a way of communicating policy objectives and actions to the people affected by them. Second, it serves as a precise record of the transactions and actions undertaken on the public’s behalf. Third, and perhaps most importantly, it serves as a resource for the public to ascertain that public actions are consistent with both the letter of the law and public intent—a process called accountability in the political science and public policy literatures. This third role is essential to the democratic process as the information contained in meticulously prepared public records become a primary vehicle for holding public officials accountable to the ethical and procedural standards established by the citizenry.

The technology underlying this important information sharing function historically has been paper-based, but is now expanding into cyberspace. Transcripts of public meetings are created documenting the debate and votes made regarding each issue before the governing body. Most commonly called minutes or proceedings, these transcripts are now commonly made available on the internet in text files where any person can review the actions of the jurisdiction. This represents a quantum step forward in terms of the accessibility of the raw documents which historically were retained in paper form at City Hall or library. Some more aggressive jurisdictions have also expanded this access to include HTML versions of documents with some live links to supporting information.

As we will see later, the primary mechanism for using this raw information for public official accountability typically lies with the media, leaving the interpretation of the information (or knowledge) included in the record, in the hands of third party actors who may have personal agendas and relationships that can color the quality of that analysis.

Technology now affords the opportunity of bridging the gap between raw information and the knowledge contained in it. This paper explores the potential and implications of a new technology that is just rolling out in
several test markets in the United States. This knowledge creation technology uses a neural net search engine to develop information architectures that not only provide expedited search capabilities from raw public records, but also preserves critical informational and relational links between separate portions of the data set. The facility with which this technology can be used will enhance the ability of individual citizens to access the specific portions of the public record of their own particular interest, thereby increasing the transparency of government processes and expanding access to public information.

The implications of e-Democracy are global. A recent study by the Pacific Council [3] identifies the ways in which e-Government and e-Democracy technologies can enhance political stability and government efficiency in poorer, developing nations and highlights on their list the issue of providing citizen access and participation. This paper will evaluate one technology, *Minutes-n-Motion*, that can expand access and improve government accountability through knowledge creation technology.

1.1. A system model of local government

To provide a context for this discussion of the potential of knowledge creation software and some of its specific implications, it is first helpful to take a step back and consider the nature and composition of the process of governing in a democracy (and hence the importance of developing e-Democracy tools) and especially the information flows. The structure, processes, and nature of local government lend themselves well to application in a system format and a simplified schematic of such a framework is provided in Figure 1, highlighting the information flows (feedback loops) between the two states in question. Figure 1 provides a schematic of one possible approach.

In this model, individuals are the active items and move within two general states: Government (depicted by elected officials, appointed officials, and civil servants) and the Citizenry. Within the context of government, the three types of individuals could be represented as individual states, but that complexity is not necessary for our discussion. Elected officials are those whose powers derive by their selection as the elected representatives of the populace. Appointed officials represent those agents of the public interest appointed by elected officials, but not on the public payroll on a sustained basis. Civil servants represent those people appointed or “hired” by the elected officials to accomplish the public purposes the elected officials identify. Since most of the control for public activities is placed with the Elected Officials, these other individuals function as their agents and, only on rare occasion, as independent and uncontrolled actors.

The transition from Citizenry to Elected Official is decided by the electoral process—through voting and those transition probabilities are influenced by numerous information flows that can be characterized as feedback loops. The transition from Elected Official to Citizen occurs either by the voluntary termination by the individual (resignation) or through the end of the individual’s term in office. This latter event can occur as either a choice by the individual not to pursue another term, rules prohibiting additional terms, or a lost election. The first and third of these scenarios are also affected by information flows and feedback loops within the system.

Information flows from local government to the citizenry through three major mechanisms: public relations and education initiatives targeted at informing and influencing the public; legislative and policy measures passed by elected officials and implemented by appointed officials and civil servants; and the official record of actions of elected and appointed officials—most often contained in the minutes of public meetings.

These information flows are generally unidirectional in nature—the public relations and education campaigns, legislative information, and public records are all placed in a format most convenient to the local government and not the citizenry. The public relations and education information is typically customized to maximize the interests of the elected official while the government codes are provided in rigid formal volumes. The public

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1 The Pepperdine School of Public Policy and eNeuralNet have established the Murray S. Craig Digital Democracy Laboratory to explore the use of Minutes-n-Motion and similar technologies to improve public access to the government and enhance accountability through technology.
records are provided in the format of convenience, most often a chronologically-based record of events and actions. These flows all move from the government down to the individual and there is little opportunity for individuals to customize the format or sequencing of this information to suit their needs better.

Simultaneously, feedback is provided to elected officials through three major mechanisms. First, and most directly, citizens exercise their ability to shape policy choices through votes. Most often this is done by selecting individuals who profess to certain action agendas. In other instances, however, this voting action can be through referenda and direct initiatives where citizens establish policies directly through the electoral process. The second feedback mechanism is through public opinion polls and communications. Some of these are formal polls of specific issues, often commissioned by the media or local interest groups. In other cases, this feedback is accomplished at the grassroots level by individual citizens contacting their elected and appointed officials. In either case, elected officials are made aware of the preferences of the citizenry through direct communications, typically surrounding specific issues. The final feedback mechanism is the payment of taxes and fees for certain activities. This mechanism both reinforces the citizens’ participation in the process of local government and also provides a crude metric for public preferences as people choose whether to pursue a given activity or not.

1.2. Accountability and accessibility

Within the context of this system, the specialized issue of accountability arises. The citizenry grants special abilities and powers to elected officials, including taxing and policy powers that allow officials and their agents to restrict the actions of individuals and to seize property and resources from them. To curb abuse of these and other powers, the citizenry creates accountability and control structures that hold elected officials in check and prevent overextension of these powers. Constitutions, by-laws, charters, and statutes provide a framework in which these accountability rules and mechanisms are defined.

The most explicit form of these accountability structures is voting—individuals can remove individuals from elected status by electing someone else. There are also numerous provisions for punitive and censuring actions against elected officials (and their appointees) in violation of the rules defined in the governing documents—ranging from public censure to termination of status. There are also specific boundaries placed on the domain of action and control available to public officials. Enforcement of some of these provisions often requires the involvement of judicial actors as the police and adjudicative power of the courts is needed to overcome those powers accorded elected officials.

In every instance, however, this enforcement is dependent on feedback mechanisms to identify violations of the boundaries of allowable behaviors by public officials. Whether it is the misappropriation of resources, conflicts of interest, unfair selection processes, unfair taking of private property, or even the unethical termination of a civil servant, enforcement of all these accountability mechanisms is dependent on the flow of information—and specifically on the flow of information from local government to individuals (the “citizenry”).

A closer review of the three types of major information flows in Figure 1 points to some significant issues in the balance of information flow between elected officials and the public. The first information flow from elected officials to individual citizens is the use of public relations and education programs. These programs are crafted by the elected officials and their agents (including public employees) to convey their specific perspective on governmental actions and initiatives. As the products of intentioned efforts to create a specific public perspective on an issue, they do not serve as effective accountability-related feedback mechanisms.

The second category of information flows, the legislation and policies passed by elected officials and implemented by their agents, serves as one of the primary points of information for most citizens as they encounter the rules and regulations in the course of living and doing business in the community. These statutes and procedures, in and of themselves, are typically devoid of the information necessary to identify potential problems with their fairness, objectivity, and evenness of impact—issues around which the accountability process is built. There is no way of knowing if the rules are consistently enforced, if individuals, and especially elected officials, benefit unfairly from the rules, if the rule was imposed with appropriate “due process,” and so on.

As a result, a third category of information feedback is provided under nearly all local government structures—“the official record.” This official public record is designed to document all public rules and laws, including public testimony, and to provide a detailed record of the involvement of public officials, not only in the development of the rule or policy, but also the extent to which the policy or proposal may benefit them or their associates. This public record is designed to provide permanent access to the actions of local government and its many actors. As a recent assessment by the British government described public access as follows:

If citizens are to participate fully in the policy process, they must be informed. Electronic access to the information that is already electronically stored will help. Enriching the
information available online will make it easier for citizens and representatives to hold the government to account. [4]

For an information feedback mechanism to be effective in serving as an accountability tool, it must be accessible to the public and reliable. In most cases, the traditions and history of the parliamentary process, reinforced with safeguards like independently elected city clerks, result in a public record that is reliable and accurate. A 2002 study by the Pew Research Center finds that “making government more accountable was Americans’ biggest hope for e-government last year (36% most important result of e-government) and it remains their biggest hope today (30%). In that same study, 62 percent of Americans felt that e-government will make government more accountable. [5]

Accessibility is often a very different story. Certainly most communities keep these records accessible through the availability of paper copies of the minutes and proceedings of public officials in a repository—often city hall or the local library. Recently, communities have increasingly made these information resources available on the internet. There are, however, significant limitations to their functionality. Specifically, these records are flat, serial records as depicted in Figure 2. Minutes for each meeting are stored in stacks or books and are separate items. Searching for information on non-electronic versions is awkward at best, requiring a thorough visual inspection of each page for desired information. Even with electronic resources, the files are staged separately and require each set to be manually downloaded before a specific search can be instituted on a document-by-document basis. It is difficult to associate multiple occurrences of an event or issue across multiple meetings and players.

As a result of this functional inaccessibility, most communities rely on expert local reporters and newspapers who follow local events closely to provide the vital linkage across meetings and issues necessary to piece together the sequences of events and actions that often occur over long periods of time. These small local newspapers become the chief accountability brokers in local communities. Unfortunately, their effectiveness in providing comprehensive accountability is often hampered by their small size (a small newspaper often serves 4 or more communities), limited resources (they typically have small city desk staffs), high turnover rates (reporters for these low-paying, small, local newspapers often change jobs for larger newspapers), and the potential for their own conflicts as they operate in the very communities where they report.

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In the same Pew study cited above, the authors found that improving the ease of use of government sites “should be a priority.” The study finds that “28 say making them [government websites] easier to understand, 25% say that government Web sites should be made more secure for conducting business, and 17% say that they should be expanded to include more information and services.” [6] As a consequence, accountability is one of the areas where local, and especially small, communities can benefit from the development of new technologies.

2. Improved accountability and access through knowledge creation technology

Current developments in search technology, combined with new and improved computing platforms, have created an environment where some of the constraints posed by these traditional approaches to information distribution, and especially the distribution of public records, can be eased. The private sector has embraced a conversation about “knowledge management” [7] and how it can restructure the effectiveness and governance of businesses. Minutes-n-Motion, a new application designed by eNeuralNet, [8] an IBM-incubated technology company in Aliso Viejo, California, uses neural net-enabled search technology to build web-served databases that facilitate knowledge creation in the public arena. This application provides individuals the ability to easily access public information and records. In its next configuration, it will even identify exceptions to normal behavior in the public record that will allow individuals to even more easily identify problems and issues. At this time, Minutes-n-Motion is the only application available using its particular approach to knowledge creation. Expanding access to public records through HTML implementations provides some of the features discussed here, but has limited search potential and requires major time investments.

Consider an example city with a population of 200,000. Over the last ten years, the city has recorded more than twenty million words in its official records. It would take a trained speed-reader 42,000 working days
(168 years) to read them let alone digest their contents. To go back and find a particular item in this paper tower, standing three stories high, is like looking for the proverbial “needle in a haystack.” Current web and database technologies have improved the situation greatly, moving through the haystack item-by-item until the “needle” is discovered.

The searcher is still, however, looking at the records for a single meeting in a given search. Databases have gone even further allowing batched searches to span years of meetings looking for specific words—and putting together specific relationships between groups of words or issues would still require weeks. The ability to relate researched items depends on an individual’s organizational skills, intelligence, research abilities and late-night stamina. The use of a neural net-based database, such as that incorporated in Minutes-n-Motion, reduces these searches to simple menus that can access complicated relationships in the official record in a matter of minutes.

Going back to the haystack example, a knowledge creation sentient technology takes the haystack apart first and then reassembles it, retaining in its knowledge cube the location of all needles and how they relate to the surrounding pieces of hay. The neural net search technology at the heart of Minutes-n-Motion takes unorganized streams of linear data, both paper and electronic, and translates them into a single multidimensional Knowledge Cube that provides direct access to the context of each datum. As shown in Figure 3, the neural net database engine parses the raw data using a set of initial rules provided by the domain expert. It then reorganizes the data again seeking to build its own library of rules and repeats these steps until an optimal rule configuration is produced (such that there is no improved match with additional rules). The resulting database is a multidimensional “knowledge cube” that retains each data item’s links to all other items in the database. With this structural design, the cube can be rotated through any dimension to see the relationships between one datum and all other items.

Using this technology, Minutes-n-Motion creates a database that is directly linked to the source documents so that any search creates a direct link to the original documents as shown in Figure 4. Contrast this information structure with that depicted in Figure 2 and one can begin to see the power of this technology. Users can easily access specific record and information points without sorting through reams of documents. This provides the individual user with customizable, direct access to the public record.

In the process of learning the structure of the information contained in the flat files, the software develops a list of rules that allows it to structure and parse the data in multiple dimensions. For municipal governments, Figure 5 presents a screenshot of the initial categories.
Information in the minutes can be searched by the names of elected officials, file and permit applications and identifiers, project and issue names, specific street and property addresses, and specific by-laws and statutes. Additionally, text searches can be performed within any of these categories to identify interactions between players. The potential for this technology to enhance access and accountability is significant. Within each of these searches, the data elements related to all of the other possible searchable parameters related to the item found are retained and reported allowing the user to access them easily.

One can also look at the entire voting history of an individual regarding a specific issue or project. It can prepare a detailed list of all the transactions of a certain type (like approvals of proposed fences or construction), and even provide the user with access to the plans and permits associated with a specific address. With its MapInfo interface, the program will even provide detailed maps of the community for the user’s reference and plot locations.

The software allows users to specifically review items with the click of a mouse button and to parse the data in exceptional ways that preserve the complex relationships between individuals, issues, and locations. Minutes-n-Motion provides a knowledge layer above the raw information that allows the user to find information and documents that would otherwise be obscured by the physical and search limitations of the technology previously available, be it manual or web-based. This process is called “knowledge creation.”

This technology was developed to respond to concerns about government due process and conflicts-of-interest concerns in a small community in Canada. Not only has the software been used successfully to identify numerous conflicts of interest, but it has also been used to diagnose procedural violations and several violations of the public trust with respect to contracting. The use of this software in that community resulted in changes to the local by-laws, resolution of litigation, and public investigations—all the direct result of the knowledge layer created by the application.

Even though the Minutes-n-Motion engine creates the ability to structure and parse the knowledge contained in the raw information, it also provides the user with complete access to the original source documents. This is an important step in that it protects the sponsoring jurisdiction from litigation due to the misinterpretation of available information—the key results of the application’s work are all public records and, as such, no new liability is incurred by the application. Any failures, breaches of confidentiality, or incorrect information is the liability of the local government that produced the information, Minutes-n-Motion simply makes it accessible.

3. Implementing knowledge creation e-democracy applications

As the discussion above has shown, a knowledge creation application like Minutes-n-Motion can significantly enhance both public access and local official accountability. The issues surrounding the implementation and deployment of an application like Minutes-n-Motion are significant and include five general categories: (1) logistics of database generation; (2) supporting the search engine and database; (3) funding the databases; (4) training users; (5) providing points of access; and (6) evaluating the results. Let us turn to each of these in sequence. The first public deployment of the Minutes-n-Motion software is currently underway in the San Francisco Bay area in California.

3.1. Database generation

The first question to address is the development of available information to incorporate into the database. The program requires digital records to construct the database. These records can be in word processor, ASCII, or any other digital format except pure images. Pure images have to pass through an OCR step to be accessible to the database portion of the software. Paper versions of records would have to be digitized to be accessible. Most communities and jurisdictions have at least 10 years of public records accessible in electronic format at this time and some go back even further. As a result most communities will not have significant problems with the availability of resources. To build the actual database, the files are made available to the vendor for processing—in the case of Minutes-n-Motion it would be eNeuralNet. The initial construction of the database is also one of the primary cost drivers of the program.
3.2. Network support

The second challenge in implementation is providing application support and maintenance. Fortunately, since the application is web-based and web-hosted, this support function can be centralized at a single location. Users access the application over the internet and there is no need for local hosting within a specific political or geographic locality (this is still possible, if desired by the local government, but not necessary). One of the functions envisioned in the development of the Murray Craig Digital Democracy Laboratory at the Pepperdine School of Public Policy is to serve as a central web server and repository for local government databases from around California and possibly the nation. The advantages of this centralized access are numerous, including the potential for cross-jurisdictional studies, and the needs of local municipalities to provide updated information can be handled electronically over the internet as well.

3.3. Funding models

Funding deployment of the technology is the next major implementation issue. Initial funding for these initiatives will likely come from joint ventures between software providers, such as eNeuralNet, universities, local governments, and democracy-oriented foundations who wish to see an expansion of citizen access to information. This seed funding will lead to the creation of several working demonstration models where the benefits, feasibility, and effectiveness of the new technology can be proven.

The prototype launch of the San Francisco database includes a user-fee licensing mechanism that should offset part of the cost to the city of providing the access. This approach shares part of the cost with community members, although it can further complicate access for low-income citizens and residents.

Long-run funding for the technology is likely to come as an add-in in the local government’s information technology budget—much like the municipal web site—as the benefits of the resource are apparent and local citizens call for the access and accountability tools that the technology provides. Overall on-going costs are likely to be reasonable and well within the scale and scope of most local government information technology budgets.

3.4. Training models

As is the case with nearly every technology initiative in both the private and the public sectors, the real significant costs and resource demands come not from the primary acquisition of a given technology, but rather the development of community-specific resources for training the lay user. In the case of this technology, the technical issues associated with its maintenance and upkeep will be centralized and significant economies of scale will result from that centralization.

Training for lay users is another issue. Much of what is needed to use the software is fairly self-evident and local librarians could probably handle basic questions, much as they do for the internet. It is anticipated that a detailed, self-guided DVD will be prepared to facilitate training local lay users. These training DVD’s would then be supplemented with volunteer advisors from within the community who are more experienced with the application. Community classes could be held and a users’ group formed to provide additional support within the community. Finally, it is anticipated that some volunteers will be available electronically as a virtual “help desk” for the application.

3.5. Point-of-access issues

The most significant issues from a public policy perspective are embedded in the point-of-access issue—the “digital divide.” Wealthier communities and wealthier areas within communities are likely to have better resources and access to computers and to the internet. As a result, it is probable that implementing this software will not evenly spread the benefits throughout the community. This is a concern in nearly every community in the United States and one that is continually addressed by local governments. The main goal is to get the knowledge and information into the hands of as many citizens as possible. Fortunately, this technology’s demands are relatively light—internet access and the ability to use the software. Since most communities either provide or are starting to provide free internet access through their local libraries (they must be wired for internet technology anyway in order to access modern information resources), the physical point-of-access problem is likely to decline over time.

3.6. Evaluation

A final consideration of deploying this technology centers on evaluating its effectiveness. There are two aspects of this question. The first is whether people can actually access and use the software, while the second focuses on whether the technology actually enhances citizen involvement and knowledge.

The question of whether people have access to the technology will be partially assessed through a survey of web addresses of those accessing the databases. Licensed users are easily identifiable and information can be
collected about them at the licensing point. Users who visit through public access venues, such as libraries are more difficult to evaluate. One approach may be to randomly survey individuals as they make use of the public-access versions. One could also compare the number of users of the Minutes-n-Motion version of the public record against access of the document and pdf versions of the records that were already accessible on the internet. The public access usage letters could also be evaluated geographically across the jurisdiction to identify potential locational barriers to access.

The broader question of whether the technology actually enhances the public process is harder to measure. One approach may be to institute a survey of speakers in the public testimony to identify whether they have availed themselves of the technology. One could also track instances of public intervention in the political process as inappropriate public actions are identified.

4. Implications of improved information access through knowledge creation technology

Assuming that community-wide access to this technology is made available, what exactly does it mean to the local citizenry and government? Returning to Figure 1 in the discussion of the systemic relationship between local government and the individual, its strongest contribution is to render the information flow regarding legislation and public records bidirectional. Will the implementation of technologies like Minutes-n-Motion actually produce the results discussed and envisioned in this paper?

Since the technology is currently only in its initial stages of deployment, it is a great opportunity for assessing several of the key concerns and assumptions surrounding the ability of this technology to enhance access and accountability.

4.1. The question of accessibility

The question of accessibility really has two components. The first of these is whether the knowledge creation technology expands citizen access to the information in the public record. The second component of accessibility is, given an affirmative response to question 1, the citizen actually has access to the knowledge creation resource.

The ability of Minute-N-Motion to provide direct and enhanced access to the information contained in the public record as posed in the first question above is self-evident. For example, suppose that a resident of the community receives a notice that one of their neighbors is considering a second floor expansion that will overlook their back yard. The resident desires to understand (1) the process at hand and (2) what the precedents for these kinds of choices are in the public record. Prior to Minutes-n-Motion, that resident would have to go to the planning department (or its website) and review a dry description of the process, most likely without any specific examples. They would then have to proceed to the Planning Department of their local community and ask a planner to provide them with some examples of prior instances where the specific concerns they had were raised and what the outcomes were, relying on the planner’s institutional memory to provide a “filter” for the records and identify appropriate projects. Alternatively, the individual could search the meeting minutes for every meeting for the period available individually for a series of key words, then review each hit to see if it is relevant.

With Minutes-n-Motion, the resident would simply go to their nearest point of internet access and search the applications field for some specific key words (e.g. “second story addition”). The application would provide a batch listing of all of the occurrences and the user could then scan those for relevance to their purposes. Upon identifying relevant records, the resident would then type their addresses (or select them from a pick list) and see the details of the process for those addresses. Not only would these records provide important information for the issue at hand, but it would also provide detailed examples of the entire planning process to the individual (including the tendencies of voting appointees or elected officials). The resident could, in the same session, look at potential conflicts between planning commissioners (and councilmembers) and the applicant and, finally, would enter the meeting well-informed about the precedents and criteria established for the issue at hand, all in the course of an evening’s research.

The issue of whether this technology will be physically accessible to the citizen, as posed in the second question above, is a bit more complex. This question is confounded by two critical decision points: (1) the willingness of the government to make the records available to its citizens; and (2) the way in which the technology is deployed. Without some level of governmental participation, the effectiveness of the technology in expanding access can be reduced, but not eliminated. An actively engaged government, however, can such a tool a significant resource to the community.

In the case of the government’s willingness to participate, the greatest barrier to implementation is the ability of the vendor to obtain the public record, ideally in an electronic format. With the Freedom of Information Act, it is technically possible to obtain this information in any community, but the nonparticipation of the local jurisdiction can greatly expand the production costs of the resource.
A second component of this accessibility centers on the funding of the process. There are multiple models for pricing the development of the data resource. One approach calls for local governments to fund the development of the database and to provide free access to all of their constituents through public data terminals, such as those already common in city libraries. While this is the most direct model, it limits the availability of the knowledge tools only to those communities willing to make the public investment in the technology. An alternative funding model licenses the technology to individual citizens and funds it through user fees. This approach has the benefit of easier implementation as the threshold for a given community to participate is lower, but raises the issue of the universality of public access and concerns about the fairness of the availability of the resource to only selected socio-economic groups within the community.

The development of this technology over the internet is a key element to its ability to overcome this latter limitation—albeit it an imperfect response. The reality is that a joint deployment that uses both approaches is most likely to provide the greatest access. The government-sponsored deployment will allow communities to maximize the accessibility to residents, while individual licenses will tend to enhance the resources available to maintain the data sets. As the deployment of this technology begins, the authors are developing a study structure that will directly compare the differential experiences of communities that pursue alternative models for providing access to the enhanced public record.

4.2. Purity of the public record

Another concern that arises as one uses a knowledge creation tool on the public record is the issue of purity. Albert Meijer [9] argues that the mixing of “on the record” (the official record) and “off the record” communications can blur understanding and negatively affect the value and quality of the record. This can be a major problem if there is no clear distinction between the official record and the “interpretative” information created by the technology. In the case of Minutes-n-Motion this is not an issue because each record that is presented to the user is in fact the original official record. The application simply provides a framework for navigating through it.

4.3. Privacy

Another issue concern about making the public record more accessible is the issue of privacy and security. For example, one of the benefits of the Minutes-n-Motion software is that it can make the public record relating to a specific address easily accessible (as easy as a pick list) with an attendant mapping capability. To what extent does this expand the ability of the public to invade an individual’s privacy?

The answer is that this technology does not expand the invasiveness of the public record, but rather renders more evident the invasiveness of the existing public record itself. The information presented is no different that that available to anyone who is willing to go down to city hall and look it up. The privacy conversation in most cases here represents a publicly-determined choice between exposing personal information and maintaining public official accountability. The enhancement of the invasiveness of the personal component through knowledge creation technologies should be resolved as a function of this public policy choice. Blanchette and Johnson [10], for example, argue that some public records should be designed to “forget.” Clearly such forgetfulness in this case would come at the price of procedural consistency—a tradeoff with which many democratic communities would likely have difficulty.

4.4. Accountability

Finally, there is the question of whether such a technological development would expand the accountability of public officials. Barata and Cain [11], for example, argue that the presumed linkage whereby increased electronic access to information increases transparency, and thus automatically, accountability is “overly simplified.” Their argument goes to the point that the underlying structural accountability systems are more important than technological developments. This has major importance to the deployment of this technology into cultural and governmental contexts where those institutions do not exist.

In communities where strong democratic accountability institutions do exist, however, this concern is not problematic. Technology becomes a tool for expanding accountability.

The increases in accountability do not come simply from the presumption that more easily accessed information makes it easier to access the information and therefore hold officials accountable. Concurrent with the expanded access to public records and information is an expansion of the accountability that familiarity brings. Before the availability of this software, an individual would have to scour hundreds of pages of documents and information to identify the possible relationships between individuals, firms, and locations. With the knowledge cube designed by the neural net search algorithm, these relationships are much clearer.
Additionally, the technology will soon provide “exception” reports to the user—identifying those instances where the actions and relationships between two pieces of information differ from the prevailing occurrences. Neural net technology uses libraries of “rules” to parse and organize the data. It is therefore relatively straightforward for the application to identify instances where those “rules” are violated and, as a result, those instances where exceptional activities may have occurred. The resulting “exception reports” will provide a resource to local watchdogs in both the public and the media to hold government accountable to the rules by which it is supposed to govern.

4.5. Some final thoughts

The final results of the implementation of this technology, if it lives up to its potential, will be threefold. First, and most important, its implementation will result in a better informed public who have more functional access to the public record and the actions of their government. This improved knowledge will not only empower citizens but strengthen the democracy within the community.

Second, the technology will improve the ability of local citizens to hold local elected and appointed officials accountable. The combination of improved information and access with the “exception-seeking ability of this technology will allow individuals to hold local government to the highest ethical standards possible. This in turn should improve public trust in their governmental institutions and strengthen local democracy.

Finally, the expanded availability of public information through the internet will likely equalize outcomes within political jurisdictions. Not only will individuals have better information about prior discussions of recurring issues, but they will also be able to insist upon equal and comparable treatment by officials. Since this version of the technology is internet-based, it is also likely to be very broadly available. Although there is currently some evidence to indicate the existence of a “digital divide” within communities, the pervasive expansion of internet access across platforms (it is increasingly common on cell phones, for example) and across geographic boundaries as it becomes less expensive, will likely make access to internet-based information systems almost ubiquitous by the end of the current decade.

The systemic structure of the relationship between individuals and their local governments has been strongly shaped by tradition, history, function, and the technology of prior times—predominantly word processing. As knowledge creation technology and neural net technology advances the capability frontier, the unidirectional flow of important information from local government to the individual can be customized to be more interactive and bidirectional, resulting in more effective distribution and utility of information.

Much of the conversation in e-Democracy centers on the question of voting and civic discussions in an electronic arena. The use of neural net-based knowledge creation systems pushes this frontier to include the basic concepts of access and accountability into the dialogue. While still in the preliminary stages, the next several demonstration sites implementing this application should provide a clear sense of whether and how this technology will live up to the potential set forth here.


[2] For an excellent example of this aspect of e-Democracy, visit the Democracy Online webpage at http://www.e-democracy.org/do . California has adopted two types of e-Testimony in their deliberations regarding a new Master Plan for Education in California. The state is hosting a moderated internet dialogue regarding the Master Plan’s recommendations (http://www.network-democracy.org/camp). Concurrently, the state is also soliciting and accepting testimony over the internet regarding the Master Plan’s proposals (http://www.hpcnet.org/cgi-bin/global/a_bus_card.cgi?SiteID=94).


[7] The Artificial Intelligence Applications Institute at the University of Edinburgh provides an excellent overview of the field of knowledge management at their website http://www.aiat.ed.ac.uk/~alm/kamlinks.html.


