

**(Re)Visions of the Village:
Building and Participating in
the Blacksburg Electronic Village**

by

Carmen Sears

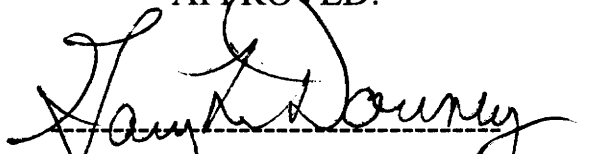
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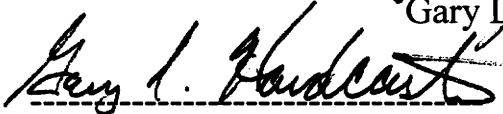
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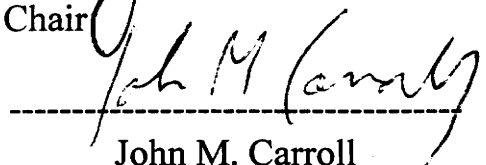
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(RE)VISIONS OF THE VILLAGE: BUILDING AND PARTICIPATING IN THE BLACKSBURG ELECTRONIC VILLAGE

by
Carmen Sears

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Science and Technology Studies

(ABSTRACT)

The Blacksburg Electronic Village (BEV) project was established as a partnership between C&P Telephone of Virginia, Virginia Tech, and the town of Blacksburg. In this thesis, I describe the formation of this partnership and the evolution of the project from early 1991 to the spring of 1996. The focus of this thesis is on the technical and policy decisions made in building BEV and on the involvement of the Blacksburg community. Several understandings, or visions, shaped and influenced how builders designed BEV and how the local community learned about it. These visions were described in the press conferences and media descriptions of the BEV project. The BEV Vision Statement included images of the project as a new marketplace, a place for electronic collaboration, a futuristic town, and a way for citizens to reconnect to their community.

While the partnership is no longer the defining aspect of the project, the original partners were able to generate enthusiasm for the project and to create a market for information services in Blacksburg. They created the electronic village first and then asked residents to come rather than involving the villagers initially in the construction. The BEV project has now entered a new phase where villagers, volunteers and local companies play a greater role in BEV's direction. This story of the BEV project provides some observations about envisioning, building, and participating in an electronic village.

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I: INTRODUCTION

The electronic village or wired city is appealing because it allows everyone to read in their own hopes for what it will bring -- economic prosperity, strong community ties, democratic decision-making, or an image of progress. These images smooth over the decisions that have already been made, the issues that are still being negotiated, and who is making decisions about the network.

Although there was a single vision statement for the project,¹ within that statement were a variety of visions of what the Blacksburg Electronic Village (BEV) could be. These visions changed and became stronger or faded as the electronic village was developed and continues to be developed. The story of BEV and the partnership that built it demonstrates an attempt to first define visions and sponsors for the project and then draw a user community to it. The interactions of these visions are reflected in the policies, funding, and technical choices made by the designers. The BEV project started as a partnership between industry, university and local government and has evolved to focus more on the separate organizational identities of the partners and the individual participants. The project has become less focused on strengthening the partnership and more on trying to attract a user community.

¹Wiencko, Joseph A. "The Blacksburg Electronic Village." Internet Research Vol. 3, No. 2, Summer 1993: 31-40. This article is the first published version of a BEV Vision Statement that was developed by Wiencko and other Virginia Tech employees and then circulated among the other project partners.

BEV started as a collaborative effort by Chesapeake and Pacific (C&P) Telephone,² the town of Blacksburg and Virginia Polytechnic and State University (Virginia Tech) to make Blacksburg a smaller version of an economically competitive United States. In the early 1990s, when the project was initiated, Japan was portrayed as the single economic competitor with the United States and BEV was pitched as a way to keep up with Nippon's plans to wire Japan by 2015. Reporting on a 1992 press conference to announce the BEV project, the Blue Ridge Business Journal reported,

Ninth District Congressman Rick Boucher says the urgency [to build the telecommunications infrastructure required for BEV] exists at least partially because the government of Japan has allocated \$100 million to bring the electronic village concept into general use [in Japan] by 2015. He wants to beat the Japanese by five years and ... has proposed that the phone companies be allowed into the cable TV business.³

Now, in 1996, the initial partnership is less prominent and BEV has begun to privatize some of its services in an attempt to integrate BEV into the community. The competition is still pitched as international, but there is no single competitor as there was at the beginning of the project. The initial organizations involved in BEV now play in a world-wide market and their partnership is not unified against a common competitor.

²C&P Telephone was the company initially involved in the BEV project, however their parent company, Bell Atlantic was also involved. In my text, I use the company names interchangeably as they are used in the newspaper articles and the planning documents.

³Smith, Dan. "Electronic Village: Technology Showcase." Blue Ridge Regional Business Journal. February 1992: 15.

While the national interest in competitiveness did give them a reason to create a partnership, the partners were not able to really create a partnership except in name. The partners have scaled down their involvement and have maintained their institutional boundaries. The shift in the focus of the project from a single competitor to a more dispersed market, the struggle to define the partnership and the attempt to bring in participants are played out in the technical, administrative, and policy history of the BEV project.

Many scholars have demonstrated that to understand a technology, you have to go inside and examine the decisions that were made and the options that were discarded.⁴ This is especially useful for something, like the electronic village, which is still under construction. Community networks are often treated as if they were self-evident and well-understood so that critics and proponents alike can claim they are worthwhile, emancipatory, democratic or manipulative without getting into the messy details inside. This approach focuses on implications and projections. In contrast, my approach to a study of the BEV project draws from both the ever-expanding body of work about the network after it is in place,⁵ and from the push to go inside the technology to get a more complicated and fuller picture of the technology's development.

In this thesis, I describe the apparent shift from a unified structure formed in the interest of creating an example for America, which was initially the public image of BEV,

⁴ See, for example Latour (1987) or Bijker and Law (1992).

⁵ The number of books about networking and the Internet has increased rapidly throughout the past year, probably more rapidly than the networks themselves!

to a privatized and down-sized free market model. I am also interested in the user community's role in the development of this project. Was the original unification simply a reaction to a nationalistic concern about being able to compete with Japan, or a desire to redefine ways that these three institutions might work together? Why did the partnership dissolve? Are there alternatives to the free market model for involving the user community? How do the various visions of BEV influence what it became? What is the role of the villagers in developing an electronic village?

In this chapter I explain some of the technologies and policies that define an electronic village, describe some of the decisions necessary for building BEV and discuss who the designers and builders of BEV are. While this is in no way a comprehensive blueprint for building an electronic village, I hope it will provide some background and a basis for discussing one particular electronic community, the Blacksburg Electronic Village in Blacksburg, Virginia. To understand this project and the partnership, one needs to understand some of the policy and technical choices made over the project's life and who the policy and technology decision makers were. Other resources are available to describe the technical, social and policy configurations of the Internet and electronic villages in greater detail than I present here.⁶

⁶See Civilizing Cyberspace for an exploration of the policies and social implications of networking. Miller, Steven E. Civilizing Cyberspace. ACM Press (1996). Internet guidebooks, such as The Internet Navigator, explore the hardware and software requirements for building a network. Gilster, Paul. The Internet Navigator. John Wiley and Sons, Inc. (1994).

What is an Electronic Village?

I understand a networked community to mean any group that communicates using some sort of mediated (not face-to-face) communication. One early networked community was the telephone party line, which allowed neighbors to pick up a telephone to talk with each other or listen in to their neighbors' conversations. With the party line, there was a networked community -- those who shared the wiring -- and an outside community that had to call or be called to participate in the party line. Geography and wiring made it easy to identify who was in and who was out of the network.

The networks built now are made up of electronic devices and complex ways of notifying others when we want to communicate with them. Anne Beamish, in "Communities Online," explains that all networked communities are a reflection of their local culture and are therefore unique. Beamish suggests categories based on Kendall Guthrie and William Dutton's work⁷ on networked communities. Beamish proposes the following technological and policy choices to differentiate different types of networked communities: system capacity, accessibility, information content, editorial control, ownership, financing, and architecture of communications channels. I propose adding the category of physical proximity of community members. This additional characteristic adds a dimensions that uniquely identifies the electronic village as a networked

⁷ Guthrie, K. Kendall and William Dutton. "The Politics of Citizen Access Technology: The Development of Public Information Utilities in Four Cities." *Policy Studies Journal*, 20(Winter 1992): 574-597. From Beamish, Ann Communities Online: Community Based Computer Networks.

community that is also physically close. As Beamish observes, there is a great deal of variety among the things that are called electronic or networked communities.

An electronic village is a networked community that is also bounded in geographic terms so that a community existed prior to the networking. For example, living in a particular city or neighborhood that built a network for the area would qualify as an electronic village. Because this definition is so broad, regarding the technical possibilities, the decisions builders and villagers make about content and policies define the electronic village more than any particular technology.

There are several things generally thought to make up an electronic village: the terminals for individuals to communicate together; the transport mechanism, like telephone lines or Ethernet, along with some control for transporting the information, like a telephone switch or the routers of the present-day Internet; the policies for publication and the information or content. The Virginia Tech BEV designers point out that the problems they ran into while building the electronic village were almost always training or procedural. They claim the problems were almost never technological problems.⁸ While what they defined as the technological problems may have been more surmountable than other problems, the technological decisions and choices were certainly not easy and are often tied to policy decisions. Builders assemble and coordinate the necessary technologies and plan for the communication infrastructure⁹ to support the

⁸ BEV Community Network Planning Guide. "Community Network checklist for success."

⁹Infrastructure is a highly over-used word. I use it to mean the underlying wiring and administration for a networked community. Often it is used to signify the wiring and administration required for creating a wired United States, the National Information Infrastructure.

electronic village. They must determine what services and software will be used and how to ensure that there is enough capacity in the switching mechanisms, the lines, and the computers which act as servers.

While the technological pieces are required to make the network function, the participants usually understand the electronic village as the interface (software) and the informational content. Content is the most visible component to its participants and the only thing that most participants can manipulate. This content can take a number of styles. It can be as simple as the text of others' electronic mail (email) messages or as complex as the pages on the World Wide Web (WWW), which include photographs, sound and video. An electronic village made up entirely of governmental public service announcements and telephone listings of local government offices has a very different character than an electronic village that consists entirely of personal communication between its residents. The first is designed for information retrieval by residents, while the second focuses on communication and interaction between residents.

Along with content, there are the policies regarding who can post information to the community. Is it all public or are there private conversations as well? Do only some people have access to certain areas of the community? Will conversations be censored? Is there suitable and unsuitable material for this community? Many of these issues are not determined initially, but are handled as they arrive. For example, Virginia Tech now has an "Acceptable Use" policy for its systems that all students, staff, and faculty that

was developed only after problems arose.¹⁰ This policy now provides guidelines for use of the shared computing resources at Virginia Tech.

The electronic village does not have a single definition because it can contain any combination of electronic access and can change and evolve over time. Network builders have to decide what types of interactions and interfaces they will include and endorse. While community members can lobby and sometimes build their own corners of the village, builders initially define which communications software, hardware and methods of interaction the majority of users will use, and set many of the policies for participation. In making these decisions, electronic builders define the village as they build it.

Electronic village builders also define membership in the electronic village. The electronic village is bounded by a place, not because it technically has to be, but by choice. Those outside the boundary have the ability to come and observe, and even to participate in some of the interactions, like chat sessions and newsgroups, but not to become a “member.” Membership does not mean that non-members are kept out but that it is easier (and usually much less expensive) for members to participate in the electronic village. For example, BEV membership as defined by BEV builders simply means that someone lives in the Blacksburg area and participates online.¹¹

Electronic village builders also must determine what type of technology is minimally required by villagers to participate in the electronic village. They determine

¹⁰ Virginia Tech’s acceptable use policy was developed by CNS employees following security violations to on-campus computers. All Virginia Tech students, faculty and staff are required to abide by this policy.

¹¹Online announcement of policy on BEV homepage message of the day. “Another BEV Milestone.” March 8, 1996.

which software is supported -- Microsoft Windows, UNIX, Macintosh or DOS for example.¹² The electronic village designers, by their choices of software and recommended technologies, determine what will be used by the majority in an electronic village. While the uses and purpose evolves over time, the choices about policy and technology establish the identity and the character of the electronic village.

Electronic Village Builders

Three partners were initially involved in the BEV project. The presidents or heads of these organizations were the most visible in the early press conferences and in the local press. They had important roles in defining to the Blacksburg public what the BEV might be. Behind the scenes at each of these organizations many people designed and created BEV. At Virginia Tech, this responsibility is within the Communications Network Services (CNS). The Electronic Village Technologies group is responsible for ongoing consultation about electronic village building in other locations as well as in Blacksburg. At Bell Atlantic several people were involved in performing the feasibility study, planning and implementing the installation of the switch, laying Ethernet and installing ISDN service to the area. For the town, the city manager, assistant manager and their staff participate by developing their own WWW pages and in one instance appropriating town money to encourage the project. Three organizations,¹³ BEV Inc.,

¹²While participants can retrieve or develop software that will allow them to participate on non-supported platforms, many BEV users use at least some of the software distributed.

¹³ For further discussion of these three organizations, see 3.2 of this thesis.

Blacksburg's Telecommunications Advisory Committee, and the BEV Working Committee, also have had a hand in determining BEV policy. Local computer and networking consultants have also influenced how BEV looks and what services are most used. Trainers, at the YMCA, at Virginia Tech and at the consulting companies also define BEV by how they explain and describe it to users. Finally, individual participants and organizations have made a difference in how BEV is built by participating in volunteer efforts to assist new users in finding their way around BEV or building a homepage for their organization. Many local groups, such as the BEV Seniors and some of the local churches have created their own very active corners of BEV.

Many people build BEV. In the early stages of the project, the majority of the work was done by Virginia Tech and Bell Atlantic employees who were, for the most part, not quoted in the local press. The heads of the three organizations who did participate in the public discussions of BEV performed an important function in describing images of the village to the press and to the Blacksburg community. While it is unclear how much these builders of the village were influenced by these public discussions, BEV was defined initially from the top down. Following the creation of the initial version of BEV by Virginia Tech and Bell Atlantic, BEV villagers started to take a more active role as builders.

Structure of Thesis

In chapter two, I discuss my theoretical approach and review the literature that influenced this history of the BEV project. I use both approaches from technology studies that focus on examining the choices made in building technologies as well as the wide array of literature about the information society. Many of these authors still struggle with how to analyze a networked community and what methodologies to use. I share this concern and also struggle to develop the methodologies they use. Additionally, in chapter two I outline my methodologies and the sources used for this project.

Chapter three is the early history of the BEV project, primarily focusing on the formation of the partnership. This formation is documented by the press conferences, the correspondence between the partnership members and the development of the BEV Vision statement. In the formation of the partnership I observe that the public representation of BEV demonstrates different visions of what it would be. However, missing from each of these visions is how the user community fits in to them.

Chapter four continues the history of the project to the present with a focus on the attempts by BEV builders to include the user community. In building the technology first and then asking the user community to participate, BEV builders found themselves in the position of trying to sell their electronic village product.

Finally chapter five explores the use of visions in designing a technological project and how the community of users can participate in such a project. I suggest that an electronic village is a different kind of technological project because of its requirement

that its consumers also be producers. It therefore is a more successful technological project if the user community is involved early in its design and construction.

This thesis is written with my personal commitment to the idea of establishing a strong community life. There have been great hopes and great hypes for the participatory nature of this new electronic medium. I am caught up in that excitement and admire the work that BEV builders have done here in Blacksburg. However I worry that we will miss a chance to talk about what it means to be a member of a community as this medium becomes yet another marketplace. This history and these observations reflect that concern.

II: Literature Review

Almost everyone has something to say about the Internet and the “wired world.” Architects, political scientists, sociologists, psychologists, philosophers, technologists and social commentators make their predictions and analyses. Theorizing about being wired or being digital is the current rage.¹ The image of “the network” that both the critics and proponents of the Information Revolution use is one that is very smooth, as if the wires were already laid, the software completed, and the policies implemented. While it is important to imagine and speculate about what it means, if anything, to *be digital* it is also important to look inside and understand what is changing and who is doing the changing. The technologies are often left out of these accounts of online society.

The Virtual Vanguard

In this group I include writers who explore the implications of being virtual to our cultures, governments and psyches. This group takes the wired state as completed. They comment after the fact, when the technology is no longer slow nor scarce but widely deployed and transparent. Many of them see themselves as pioneers in exploring this new virtual territory, but the frontier has gotten crowded. Some of this literature is written in broad terms about the collective consciousness and communitarian spirit of the medium (Rheingold). Others claim there is potential for redefining the way citizens think

¹ Many writers use this jargon of “being wired” or “being digital” to emphasize that people are connected to the Internet by telephone and ethernet lines. These terms also capture an image of recreating oneself as a digital being, someone dependent on that connection.

about their cities and its physical structures (Mitchell), or point out the dangers of wiring ourselves to death (Postman, Roszak, Stoll, Kroker and Weinstein). Some writers discuss the Information Revolution as a way to define our time (Beniger, Dyson and Gilder, Kling). Others examine the online world as a place to work out our real identities (Turkle). This literature suggests that there is potential for social, political, economic or personal change in a world that is wired.

The writers mentioned above exemplify a literature that focuses on the potential changes, benefits and costs of residing in a virtual space. The price for this new additional access is that these technologies now reside in your private space, your home and maybe even in your body.² They remind us that while information technologies may provide greater access and a more democratic or participatory medium, they also monitor. These writers demonstrate that while cyberspace may appear anarchistic and ungovernable, there are still people in charge. Those who design and sell on this medium are always interested in which services are used, which services are “needed,” and hope to design more spaces people want to visit. While it may be a different form of control, these writers remind us that there are similarities and differences between virtual and real life. These writers explain that virtual spaces can break down traditional boundaries of space or country, can be individually empowering, but can also monitor your every

² The smaller, lighter, and wireless technologies makes portable access to the Internet much easier. Technology can therefore travel with a person, almost as if it is were a part of the body.

virtual move. These writers provide sometimes contradictory pictures of where a networked world might lead.

Mark Poster, in The Second Media Age, claims that former critiques of mass media are flawed because they consider media only in the broadcast model. Now, he says, the technology has changed so that everyone can be an information producer as well as a consumer. He paints the Information Age as democratic and participatory, although with a loss of privacy. Poster explains that the communications superhighway “undermines the territoriality of the nation-state.”³ It serves to make borders of nationality, borders of legislative power and even borders of language obsolete. For Poster, the blurring of boundaries in a network is completed simply because there is a network. With this new model of individual participation and a blurring of well-defined borders, Poster’s analysis is that this is an individual’s medium with regards to national boundaries, but one that is instead controlled by industrial forces.

William Mitchell, in City of Bits, takes an architect’s perspective on the growth of cyberspace. “The network is the urban site before us, an invitation to design and construct the City of Bits.”⁴ He claims that the need for built spaces is being reduced with the advent of this medium and views it as an opportunity to redesign our cities, work and living spaces in, perhaps, a better way. The libraries, offices, bookstores, museums, schools and prisons are changed due to the ease of distribution and publication of

³Poster, Mark. The Second Media Age. 1995. page 28.

⁴Mitchell, William. City of Bits. 1995. page 10.

materials online. He investigates the city, workspaces, and new understandings of citizenship in an effort to understand what lies ahead. “The uncertainties and dangers of the bitsphere frontier are great, but it is a place of new opportunity and hope ... This will be the place for a global village.”⁵ Mitchell provides a hopeful look toward an online future where we transcend some of the problems of the real world. His analysis, like Poster’s, is that this medium empowers individuals to take control of their environments to redesign or represent the physical world in a new way.

By contrast, Arthur Kroker and Michael Weinstein take a more dystopian view of the future in Data Trash. They remind us that there is more going on when we sign up and sign on. Kroker and Weinstein use the new virtual technologies in combination with recombinant biology to explain that we are signing our bodies and minds over to be reassembled in the virtual world. They examine the world of virtual reality and tie it to a decline/decline of “the West.” “We no longer live in the time of technology, but in the empty space of virtuality.”⁶ Kroker and Weinstein describe the Xerox PARC office plan that monitors where employees are at any time and virtually represents them on the screen. They compare this to the electronic cuff worn by stay-at-home prisoners. Kroker and Weinstein point out that this is a kind of surveillance that is much less visible than the surveillance predicted in George Orwell’s 1984 because we actively seek to become virtual. We choose to be monitored. Kroker and Weinstein, along with poking fun at the

⁵Ibid. page 173.

⁶Kroker and Weinstein. Data Trash. 1994 page 51.

techno-utopian dreams of other writers, discuss capitalism on the Net. “Virtuality arrives through the effort of profit-making enterprises to find new markets when they are under stress. Virtuality sells.”⁷ Often the free market on the Internet is described as a way to be leaderless with no-one in charge. Kroker and Weinstein point out that there is definitely someone in charge -- the virtual class and those who profit selling virtuality.

This diverse group of writers emphasize that the new wired state crosses traditional boundaries, speeds things up and allows increased interaction. These writers also remind us that this cannot come at no cost. While the Information Society does hold promise, it also holds the potential to monitor and control. These observations are interesting and useful because they remind us that there is more going on when we implement new technologies. They do more than simply speed things up or make things easier. There are potential social, political and psychological changes associated with electronic communities.

Technology Studies

While the virtual vanguard provides an exciting and interesting picture of the potential of the Internet, wired city, or electronic village, I believe it is important to include the story and the decisions of the development of a technology. Various scholars have studied technologies by examining what goes into the development of a fact or an artifact by looking at the assumptions, decisions and institutions associated with building

⁷Ibid. page 69.

things.⁸ There are several themes that I find useful from this literature for the study of a technological project that remains under construction. These analyses demonstrate that it is important to understand failures as well as successes, the technologies that have staying power as well as those that are discarded. Technology studies literature also demonstrates that technologies do not simply follow trajectories from research to diffusion, but instead often continue to be developed and changed by both users and designers. These analyses demonstrate that technologies are part of the societies and communities that create them. Technological projects are influenced by those who create them, so looking at decisions made in the creation of technologies describes not only the technological artifact, but the ideas of the community of builders and participants. Finally, the descriptions used to envision the technology are important to its development. These descriptions define, not only what is hoped for, but why the technology is desired and what it might fulfill.

In their study of the TSR.2 project (Tactical Strike and Reconnaissance aircraft), John Law and Michel Callon examine the failure of a large project. Their history of the project illustrates the “interpretative flexibility” of objects as the aircraft “changed shapes both literally and metaphorically during the course of development .”⁹ They observed that in the process of developing and planning this large project, various groups understood the project differently and therefore made development decisions that resulted

⁸See, for example, Latour, 1987, Bijker and Law, 1992, Bijker, Hughes and Pinch, 1987

⁹Callon, Michel and John Law. 1992. page 42

in changing the shape of the project. In this case those oscillations led to the demise of the project.

For the Ministry of Defense and the RAF [Royal Air Force], it was not a strategic bomber but a tactical strike and reconnaissance aircraft. For the Treasury it was relatively (though insufficiently) cheap. For the Navy it was a successful competitor to the Buccaneer [An aircraft of similar design], and for the Ministry of Supply it was an instrument of industrial policy.¹⁰

Designs of the project by the groups differed in the technical requirements for what the plane should be able to do, such as a short takeoff capability or high speed flight. These features required different design strategies, wing lengths and wing locations. Other decisions such as where to locate the engine resulted in additional design changes.

Management of the project was by a complex series of committees which meant that none of the agencies or individuals involved was in a position to control the project. The technical committees often made decisions without regard to costs, while the committees concerned with expenses often had little information about the technical necessity of the tasks they were examining. This story demonstrates a project which was understood by the various participants in very different ways. Callon and Law learn which of the understandings won out from the technical choices made in the design of the aircraft.

¹⁰Ibid. page 24.

However all of the images, as well as technical and political constraints, changed and defined the resulting aircraft.

Callon and Law demonstrate the importance of understanding the technical and administrative choices for defining the visions and directions of a technological project. There are many similarities between the TSR.2 and the BEV project. BEV is managed by several committees, and is made up of several groups who have very different understandings of what the project is. The technology takes on characteristics of its builders and participants and continues to change over time as people learn new uses and capabilities. To say that an electronic village is constructed by the various images and constraints of its builders seems obvious because humans lay the wire, write the code, post the information and pass the laws that create the electronic village. However, why some images succeed and others do not is not as clear. Often a project's success or failure depends on a variety of technical, social and political issues which is why an examination of the decisions, public representations and documents is useful to an understanding of the project.

Gary Downey demonstrates that the software developers incorporate and build themselves into the code in his description of the Aircraft Synthesis (ACSYNT) project. This project, like BEV, involves three institutions: university faculty and students from Virginia Tech, industry representatives from Boeing and Lockheed, and government employees from NASA. Downey explains that his interest in the project is that "its members are blurring the boundaries among their institutions by means of the code

itself.”¹¹ He describes this rewriting of software as a way of redefining these organizational relationships and therefore changing common assumptions about the relationship between technology and society. This process of explicit change demonstrates the close connection between the code and the coders involved in the process. Instead of delegating organizational change to a faceless anonymous computer or network, the coders acknowledge that they are changing the way they and their institutions work together. By looking at the technical details of how the code was revised and constructed, Downey demonstrates the importance of going inside of the technology to develop a more complex picture of how the culture of those doing the constructing influences and interacts with the technology. He also demonstrates that institutional identities or national interests can be written in to a technological project.

The BEV project partnership also includes participants from industry, university and government and was initially formed in an attempt to blur the institutional boundaries for the benefit of the nation. However, in BEV’s case, these boundaries stayed intact throughout the project, and are even more evident in its current stage. In building BEV, designers attempted to form a partnership as an experiment that could be replicated in other locations. While it never really solidified as a partnership, the attempt is important to understanding and learning from the project.

¹¹Downey, Gary Lee. “The World of Industry-University-Government: Reimagining R&D as America.” *Technoscientific Imaginaries*. Ed. George E. Marcus. Chicago: University of Chicago Press, 1995: 200.

My Approach

I attempt to use ideas from technology studies to study the subject matter suggested by the virtual vanguard. I claim that technology studies can do more than those who have stayed on the surface of technology to talk about the future. Those who write about the Information Revolution do participate in an important process -- that of making observations about society, economy, culture and politics that is influenced by and influences a more computerized society. They emphasize the economic potential that network designers are counting on. My approach is to use the development of a technology, the electronic village, to describe change but to keep the politics and technology in the story. Decisions about what software to include, whether it be a closed network or to have access to the Internet, how participants are attracted and how decisions are made are important to technological and social change. I subscribe to the idea that the technological and administrative choices made reflect the designers, the participants, and society more generally. I plan to inform my account of the BEV project and its partnership with the idea that the visions and decisions along the way make important statements about the project and about society. My goal is not so much to explain the development of BEV as it is to learn something from it.

Methodology

The Blacksburg Electronic Village project has been extensively studied, but only documented by magazine and news articles which provide mostly giddy accounts of the

potential of the project. There are a large number of interviews with BEV planners and news articles that document the project. The BEV History Project¹² has done an excellent job of collecting some of the interviews and many of the news articles and minutes from Blacksburg's Telecommunications Advisory Committee meetings related to the project, making the job the of historian easier.

I also contacted researchers who had done interviews on various topics related to BEV whose interviews were not in the HistoryBase. This thesis was informed by six interviews done in early 1994 by Dr. John Dimmick, from Ohio State University, seven interviews by Jock Schorger, a Virginia Tech Ph.D. student in Education, done in late 1994 and early 1995. I collected and transcribed ten interviews by members of the computer science course CS6704: Community Networks, Networked Communities, which were done in late 1995. I also conducted and transcribed a supplementary number of interviews in 1995 and 1996. The interviews were primarily with BEV builders and planners from the Blacksburg town administration, Virginia Tech employees, Bell Atlantic employees and local businesspeople, who all had a part in the specification, administration, publicity or design of BEV.

I reviewed several videos which documented the project's history. These included: two press conferences, one in January of 1992 to announce a feasibility study

¹²The BEV History project was initiated in 1994 to develop an online history of the BEV project. The project was supported by National Science Foundation grant NSF CDA-9424506, "Building a history of the Blacksburg Electronic Village." Principle investigators are John M. Carroll, Andrew Cohill, Gary Lee Downey, Edward A. Fox, and Mary Beth Rosson. The HistoryBase address is <http://history.bev.net/bevhist/>

for the project and one in January 1993 to announce the plan to go ahead with the project. Additional videos recorded the preparation for the 1992 press conference in which Virginia Tech employees prepared and tested the demonstrations, the news coverage by local television channels which followed the 1993 press conference, and a film entitled “Community Computing: If it Plays in Peoria,” which was shown to the town’s Telecommunications Advisory Board early in project discussions.

The BEV project has been publicized in the popular media and I have collected, with the help of the BEV HistoryBase, approximately 100 newspaper and magazine articles covering the BEV project dating from the initial announcement in early 1992 to 1996. I examined unpublished planning documents and communications provided by a former Virginia Tech employee and BEV planner, Joe Wiencko. These planning documents and letters, dating from early 1991, describe some of the early technical plans, ideas about partnership and visions for the project.

Along with collecting existing data, I participated in two Virginia Tech projects related to BEV. One was the planning phase for the BEV History Project which occurred in the form of occasional meetings during the fall of 1994 and spring of 1995. At these meetings, we discussed which documents were available, and which artifacts, articles, video clips and interviews could be saved in an online history. These meetings helped me to become interested in the oral and online history of such a project and the changes in both administration and function even at this early stage in the project’s history.

In the second project I participated as a graduate research assistant, working with Dr. Scott Patterson on a study funded by SouthWest Bell Communications. Dr. Patterson, an assistant professor in the Communication Studies department at Virginia Tech, has been doing research on BEV since its official opening in 1993. In the spring of 1996, I assisted Dr. Patterson in running five two-hour focus groups with volunteer BEV participants. These focus groups were fairly open ended and often led to other comments about using the Internet and BEV. Due to the timing of these focus groups I became aware that many townspeople felt cut off by the university's announcement of dropping modem support to non-Tech affiliated users in the spring of 1996.¹³ The participants in the focus groups were self-selected, and primarily represented the power users¹⁴ who were comfortable behind a computer. However they did express a variety of understandings of the electronic village.

The research for this thesis has been a process of digging and showing up. I have been a member of the BEV community since I moved to Blacksburg in 1994 and have shown up whenever I could to participate in the formation of this village. I am influenced by Emily Martin's research methodology and writing in Flexible Bodies. In her project Martin worked to discuss the immune system using a combination of interviewing, examination of visual and written representations in technical and popular press, and her

¹³In early 1996 Virginia Tech's BEV office announced they would no longer support non-Virginia Tech affiliated users on the Virginia Tech modem pool. Other modem access providers would handle access for Blacksburg residents who were not associated with Virginia Tech. Many Blacksburg residents conflated the modem pool access and BEV membership causing them to feel they were being kicked out of BEV.

¹⁴An uncharacteristically high number of the focus group participants were local Internet consultants and volunteers in the BEV office.

own experiences as a participant/observer in a medical laboratory and an activist organization. She interwove these representations and experiences to describe an understanding of the immune system and our cultural expectations for our bodies. I too have used a combination of interviews, images, articles and experiences with the electronic village to develop a picture of the project's history. Using slices of life in building and participating in the electronic village, I found it impossible to provide a complete picture. However, this research can contribute to developing images of the electronic village and to understanding and learning from what is occurring right under our noses (or keyboard-ready fingertips). The implications of revealing these images can help village designers think about how their work enforces particular images. It also may encourage villagers to take a more active role in the development of these technologies and policies.

Some of the writers I examined in the section on the virtual vanguard struggled in their writing to find a methodology that works. There are special problems associated with doing research on the Internet or virtual spaces. Such problems include how to accommodate participants' privacy and how to represent a wide array of voices on a medium where it is unclear who is represented. There are a large number of quiet participants and non-participants whose voices are not heard in accounts of creating a vision for BEV. The image-makers and leaders of the project are especially prominent in defining BEV and I found it difficult to compensate for that other than to simply point it out. I represent the public images of BEV, the BEV builders' struggle to reconcile the

visions, and their attempt to incorporate the villagers into their visions. However, in this I too struggle with the methodological challenges of working in a virtual space. By developing a framework for talking about an electronic village -- describing the decisions made, the components and the builders -- I hope to begin more discussion among villagers and builders.

III: United We Stand

The BEV project had no signed agreements, no technical or functional specifications and no legal documents when it was announced. The partnership seemed to initially stand on handshakes and smiles, most exemplified by the two press conferences. The first was in January 1992 when four men stood together in Blacksburg to announce a feasibility study for what would be called the Blacksburg Electronic Village and then again in January of 1993 when the same four men stood together to announce that the Blacksburg Electronic Village project was feasible. These four men represented the coming together, at least visually, of national government, local government, industry and university. Through those public presentations of the project and the activities of planning and building BEV, several distinct visions for the project emerge.

Formation of the Partnership

The BEV project was initiated during a time when the public was becoming informed about computer networks. Long before the first BEV press conference futurologists predicted an “Information Revolution” that would be cleaner and more empowering than previous revolutions like the Industrial Revolution. The ownership and control of information became important not only for competitiveness in the business community, but also to national interests. During the late 1980s and early 1990s, companies were laying fiber optic rings in office parks and larger cities, and beginning to

talk about high speed applications for transferring data, voice and video. Rick Boucher, Representative from Virginia's ninth district, introduced the "Cable Competition Act" in 1989, the goal being to "improve competition in the delivery of television programming, to prohibit discrimination by cable programmers, and to permit telephone companies to provide video programming."¹ Fortune Magazine told us that consumers wanted more access to information at home in the 1990s.

Many technological innovations in the Nineties will make staying home more fun. So-called smart television will read the TV listings and record programs you might want to watch later -- editing out the commercials -- while also scanning databases for information of interest, answering the telephone, playing compact discs, and running other appliances around the house.²

People were encouraged to think of communication more broadly and information technologies were presented as an integral part of life to be used to perform chores like grocery shopping or going to the library. Through these projections consumers began to understand what was possible with advances in information technology. However it still was not clear how all of these technologies would function together, whether the regulatory environment would allow an Information Revolution, nor who would provide and oversee these integrated services.

¹Bill H.R. 2437 of the 101st congress, 2nd session. The bill was not passed, but became input to the Telecommunications Act of 1996, which was passed in February 1996

²Fisher, Anne. "What Consumers want in the 1990s." Fortune Magazine. January 29, 1990.

In a white paper titled “Cable Competition Vs. Cable Regulation,” Congressman Boucher explained why it was important to allow the telephone companies into the cable market. This white paper was written in conjunction with a bill³ to allow telephone companies to provide cable service. In the white paper, Boucher called on the Congress to recognize that America needed to be aware of the progress other nations were making toward developing their own telecommunications infrastructures. He expressed concern that American businesses would be at a disadvantage if the United States did not provide new initiatives for its strong, but threatened, telecommunications infrastructure. Boucher noted,

Let me emphasize that our telecommunications infrastructure is still the world’s best, providing universal, affordable basic telephone service to nearly every citizen. However, we cannot close our eyes to the great strides made by other nations.

For example, FCC Chairman Alfred Sikes recently pointed out that Japan is readying its citizens for the ‘family computer,’ a terminal developed by the national telephone company, Nippon Telegraph and Telephone (NTT) for the purpose of educating Japanese children. Wide usage of that terminal will be possible because of NTT’s plan to deploy fiber to nearly all Tokyo homes with children within the next few years.⁴

³ Bill H.R. 2437 of the 101st congress, 2nd session.

⁴ Boucher, Rick. “Cable Competition vs. Cable Regulation: White Paper on Telecommunications Policy.” page 4. In the paper, Boucher refers to the remarks of Alfred C. Sikes, Chairman, Federal

Boucher proposed cable reform to avoid the creation of cable monopolies and to encourage competition in that industry. Boucher hoped this competition would result in the development of the complex infrastructure required by new communications services. “In dealing with cable’s market power, we have an opportunity to look forward to the potential of broadband video rather than backward at the problems posed by cable thus far ... The problem is more than just a matter of rate increases; it’s about the video future.”⁵ Although this cable reform legislation was not passed, Boucher expressed a desire to institute greater competition within the communications industry and to develop the infrastructure required for the projected services and products.

The BEV project was initiated in this climate of experimentation with communications technologies, and a desire to integrate data, voice, and video services to keep an economic edge. Members of BEV’s project team had a variety of reasons for wanting to build an electronic village along with these more national concerns. Some claim that the project was initiated as a way to mend ties between the town, the local phone company and Virginia Tech after Virginia Tech installed their private phone system on campus. This installation of ROLM phones and switches resulted in the loss of Virginia Tech as a customer for C&P Telephone and lost tax revenue for the town of Blacksburg. According to Ron Secrist, Blacksburg Town Manager, “When C&P ... was removed from ... providing telephone services on campus the loss in revenues in our

Communications Commission, before the United States Telephone Association, San Francisco, California, October 16, 1989, page 7.

⁵Ibid. page 6

consumer utility tax was upward of \$90,000.”⁶ With BEV, both the city and Bell Atlantic could expect increased telephone usage and additional services, such as Ethernet. Others claim that BEV was simply an effort by the university to reach off-campus faculty and students and provide the same services that they had on campus. Some thought that BEV was to be a high-tech testbed for software and hardware companies to come and try out their products. The most wired and most computerized town in the nation would provide the perfect real-life laboratory for these new services. Others hoped that the project was a way for Blacksburg to increase its earning potential and connect with the rest of the world. BEV could be an economic development project that would attract new businesses to the area by overcoming Blacksburg’s physical isolation. And still others claimed that this was a way to reconnect to the Blacksburg community and to build connections among the townspeople themselves. The Blacksburg Electronic Village was all of those things, especially in the early stages when everything was possible and Blacksburg represented not only a town, but perhaps, even a nation that would one day be equally as wired.

While the partners expressed different hopes for BEV, what unified the project was that it was a partnership. The embodiment of BEV could have been almost anything in its planning stage. What became important was that it was a joint project and that the boundaries separating local government, academia, and a corporation could temporarily dissolve. The project represented three institutions working as a team to anticipate the

⁶Interview by John Schorger with Ron Secrist. January 4, 1995.

future. The BEV project partners were able to do what none of them could have done as easily on their own due to budgetary constraints, technical expertise, or legislative restrictions. These problems seemed to evaporate in the name of a partnership project.

Some time in early 1991, Bell Atlantic and Virginia Tech employees began discussing the possibility of providing connectivity to campus computing resources for off-campus students, staff, and faculty.⁷ On April 17, 1991, “The Blacksburg Community Network,” as it was first named, was described at a meeting between C&P and Virginia Tech employees as a network for the entire community and a way to establish Blacksburg as a testbed for community networking trials. The project was envisioned as a network that provided a variety of functions -- educational, economic development, civic and improvement of quality of life to a rural community. The user community was described as including K-12 students and teachers, people in businesses and professional services, Virginia Tech students and professors, civic leaders and volunteers, and individual citizens.⁸ BEV was an exciting and novel project that C&P and Virginia Tech employees alike felt would push Blacksburg toward the Information Age.

The Virginia Tech and C&P agreement was formalized in a letter dated May 30, 1991 from Dr. Bob Heterick, Vice President for Information Systems at Virginia Tech. In the letter to Hugh Stallard, President and CEO of C&P Telephone Company of Virginia he asked Stallard to participate in the project. In the letter, Heterick commented

⁷Meeting notes from Bell Atlantic and Virginia Tech employees on potential electronic village project, dated March 1991.

⁸Taken from “Objectives” section of a presentation by Joe Wiencko, Virginia Tech to C&P Telephone on April 17, 1991, entitled “The Blacksburg Community Network.”

on the current state of networking and how much it had already affected both the business and university communities. Heterick states,

Lately, as I have looked back for that gathering wave of widespread network access that will sweep all of society into a 21st century networked nation, I have become increasingly concerned. That such a wave is barely, if at all, perceptible ought to be a major concern for the economic well-being of this country. Clearly this is an economic problem, not one of technology. Just as clearly, the logical and appropriate providers of this new transport network are the telephone companies. I suspect that from the telephone company perspective, the critical mass of services and applications, which would generate demand for data network facilities at the household and small business, [does] not exist. This seems to me to be the classic chicken-egg problem -- which comes first, the network or the information and computer-based services on the network?⁹

Heterick continues with a description of the Blacksburg Community Network as an “end-user and local business driven, information and computer systems application development project.” This letter served as an invitation to a meeting to discuss and announce a proposed feasibility study and partnership. At this stage Heterick describes his vision of the project as an economic development project that is important not only to Blacksburg, but to the nation.

⁹ Personal correspondence May 30, 1991 from Bob Heterick to Hugh Stallard.

Later that year, Heterick went to town officials with the proposal that three institutions-- Virginia Tech, C&P Telephone, and the town -- team up to provide residential networking access. Heterick presented the project as a collective idea between Virginia Tech and C&P Telephone to make Blacksburg a high technology area and to provide connections to other areas for increased learning and work opportunities. The town of Blacksburg was convinced to join the project, making the initial partnership complete.¹⁰

The First Public Negotiation: Feasibility Study Announcement

The first announcement of the project was a press conference held January 20, 1992. At the conference James McComas, president of Virginia Tech, announced a feasibility study for a project that would “go beyond geography and technology” and would make “knowledge and understanding more available.”¹¹ Hugh Stallard, president and CEO of C&P Telephone, spoke about the shift he saw from thinking about moving people to jobs, schools and leisure activities to moving information, jobs, education and services to them. The feasibility study, which would be performed by C&P, was to examine the technology required, the costs, and capabilities of the project. Stallard said that their company would work with the other partner to push Blacksburg to the forefront

¹⁰Minutes from Telecommunications Advisory Committee meeting.

¹¹Videotape of Press Conference January 1992.

of the Information Age. Stallard presented a vision of Blacksburg as *the* progressive town and an example for other Southwest Virginia towns.

Joe Wiencko, Virginia Tech project director, presented the plans for BEV that had been discussed by C&P and Virginia Tech employees. “This is a project about people, not technology,”¹² he said. Wiencko explained that the technical tools necessary for the project were already available and the task was to match them with the needs of the users. Wiencko separated the technology from the townspeople in his description, explaining that one could be overlaid, or matched with the other. He explained that the townspeople are the important component, but describes the technology in his presentation. Wiencko explained four tiers of service for the project, by now renamed the Blacksburg Electronic Village, which allowed a gradual ramp up to more complex technologies, starting with existing telephone lines and modems to access campus servers. He says, “We have a plan for the future. We have forged a partnership with government, university and industry.”¹³ Wiencko developed a vision of a technology testbed town and emphasizes the importance of the three institutions establishing a strong partnership to develop a prototype for other communities.

The three representatives of local, state and national government expressed excitement over what the project might mean toward the development of a networked future. Rick Boucher, Ninth District Representative, voiced his support for the project

¹²Videotape of Press Conference. January 1992.

¹³Ibid.

and pitched his cable reform legislation. He painted a picture of a variety of high-end services that could be made available to the town of Blacksburg -- video shopping, banking, and movies on demand. Boucher emphasized the need for financial incentives to telephone companies to modernize the networks. Former Virginia Governor and Center for Innovative Technology President Linwood Holton shared his hope that Blacksburg could set an example for the world of “how information can be manipulated for the betterment of humankind.”¹⁴ Dr. Roger Hedgepath, Mayor of Blacksburg, was the final speaker and he focused on the strong possibilities for such a partnership emphasizing that the town was prepared to become a full partner. While all the participants voiced strong support of the project, no one described what role each of the partners would play, nor the role of the villagers in Blacksburg.

Following the speakers was a demonstration of existing software applications that could potentially be part of the services BEV would provide. When he directed the group’s attention to a table filled with computer monitors, Heterick claimed, “It really isn’t magic. It is really very simple.”¹⁵ While it may have seemed simple to Heterick, the display of technology on the table was meant to impress. Among the applications demonstrated by Virginia Tech employees were an online architecture course complete with videos, slides and music, the Cleveland Freenet, a community network for the town of Cleveland, Ohio, the Virginia Tech library system (VTLS), an interactive French

¹⁴Ibid.

¹⁵Ibid.

language session, and Prodigy, an online service which provided news, weather, online investing and shopping. The demonstration was described in the Roanoke Times and World News.

A row of thirteen computers stood ready on one side of the room, a blue curtain covering a maze of plugs and cords. One computer showed a shuttle launch, another showed Heterick and others at the lectern.

The technology isn't new, but it still seemed somewhat elusive to some who watched the demonstrations.

“Oh gosh, I still have a rotary phone,” said Francis Parsons, a veteran member of the Town Council. “Some of us will have to go back to school I think.”¹⁶

Although none of the software was developed specifically for the BEV project, the demonstration provided a picture of the possibilities for multi-media communication and information resource sharing.

C&P Telephone had the primary responsibility for completing the feasibility study which was to yield results on the technical and financial issues by the summer of 1992. On June 8, 1992, Robert Heterick updated Blacksburg city council members on C&P Telephone's feasibility study. He explained, “It's not a feasibility study from the standpoint of the town and the university. There *will* be a Blacksburg Electronic Village.

¹⁶ McCue, Cathryn and Madelyn Rosenberg. “A look into the future.” Roanoke Times and World-News. New River Current. January 21, 1992.

The issue is to what extent C&P wishes to be a part of this.”¹⁷ Despite the unified image of the first press announcement, Heterick indicated that one of the partners, C&P Telephone, could be less involved. “Heterick predicted C&P would lose out financially for involvement in Blacksburg’s village. But their costs will be recovered when they can replicate the concept in other places without the mistakes they make here.”¹⁸ The feasibility study appeared to be focused on C&P’s potential earnings and their vision of the village was one of a model or testbed community that they could sell to other customers. This vision of BEV, of a replicable project, was described along with other visions at the 1992 press conference and was developed further by C&P’s feasibility study and their focus on an ability to develop BEV as a package.

The feasibility study was completed and apparently the results encouraged C&P’s investment. In September 1992, the Roanoke Times proclaimed, “The Blacksburg Electronic Village System should be available to the computer public early next year.”¹⁹ While the feasibility study was conducted Virginia Tech employees developed and tested a package of software to provide to the public. This initial software package included information access software (ftp and gopher), a news reader and electronic mail. The goal of Virginia Tech developers was to provide an easy to use interface from anywhere in the Blacksburg area to network services at Virginia Tech. Easy networking access was uncommon at that time because it required a strong understanding of networking

¹⁷Jilk, Linda. “Electronic village could be reality by ‘93.” The News Messenger. June 9, 1992.

¹⁸Ibid.

¹⁹Rosenberg, Madelyn. “Blacksburg users anticipate linking as ‘computer village.’” Roanoke Times and World News. September 3, 1992.

protocols and commands. The first software package was an attempt to provide the resources of the Internet to the entire town. The software was tested initially by a small group of users, the “beta group.” Despite the focus on the technical aspects -- the software, the switches and telephone lines -- Bob Heterick claimed that the real trick for the electronic village to work was generating interest. He said, “The main problem for us is attracting enough interest from people in the community to bring more businesses to the electronic village.”²⁰ At this early stage, the builders knew that the electronic village could be built in some form but were concerned that enough villagers and other businesses would be interested enough to sustain the project. BEV designers knew that the villagers were important to their project but did not seem to know how to include them in the process of defining the visions.

C&P Telephone, along with determining its investment and potential returns, was trying to decide which technologies to deploy. They planned to provide a new digital switch for Blacksburg to replace the outdated one. Although this replacement was described as a decision that was made independently of the BEV project, those involved acknowledged that it would significantly change the capabilities for town residents and would be required to operate an electronic village.

The decision to install the switch was independent of the village. Lowe [David Lowe, Vice President for External Affairs, C&P Telephone] said. C&P should have a decision on what type of backing the company will

²⁰Ibid.

give the project by mid-October ... Technology is one thing and C&P wants to be on the cutting edge, Lowe said. But C&P also wants to get back its initial investment -- an investment that would be at the very least, in the millions.²¹

During the feasibility study phase, the partners were working primarily independently. Virginia Tech employees were developing and testing the software, C&P was determining technical requirements for transporting the information and financial promise for the project, and the town was involved in advising the project through the Blacksburg Telecommunications Advisory Committee.

Each partner also participated on the advisory groups that were established to work with BEV. The three groups were the nine-member Telecommunications Advisory Committee, appointed by the town council; the Blacksburg Electronic Village Working Committee and the Blacksburg Electronic Village, Inc.²² The Telecommunications Advisory Committee was formerly the town's cable television committee, which had existed prior to formation of the BEV project, and was expanded to include the electronic village. The BEV Working Committee evolved from weekly project status meetings regarding the development and functioning of the project. BEV, Inc., which meets quarterly, was initially formed to manage the grant money for BEV, so that one of the

²¹Ibid.

²² "The Electronic Village." Virginia Town and City. October 1994.

partners would not have that responsibility. Ron Secrist, Town Manager, described the formation of BEV, Inc.,

Originally, it was formed to be a recipient of grant money. We just recently got a grant for 270 something thousand dollars. But we didn't get grants initially like we thought we might. There was some discussion that people like HP or Microsoft might use the Blacksburg community as a testbed for ... various programs but that didn't develop like we thought it would. And so the electronic village board has transformed over the years. ... They have transformed more to be involved in what types of services that ought to be provided on BEV? Are those services representative of the community? What kinds of fees should be charged for people who are signing up for BEV? ... It is more of a community standards board now than ... a money distributor.²³

Within these tasks and organizations, each of the partners was working out their own role for the project and how they fit in the partnership structure. Virginia Tech employees had primary responsibility for organization and management of the project and determining which services would be provided. The other two partners had consulting roles as to what was technically feasible and what would be of use to the town. The town's focus was on creating a futuristic village where people would want to live and Bell Atlantic was primarily interested in developing a marketable product.

²³Interview by Jongwon Park with Ron Secrist. November 1995.

Restating the Partnership: The Project Announcement

Following the feasibility study, the partners reunited once more to present publicly an image of a partnership. In January 1993, a second press conference was held at Blacksburg Municipal Building to announce that the project would go forward with an initial deployment in the fall of 1993. Four of the same speakers returned to represent national and local government in Representative Boucher, and Mayor Hedgepath, the university in Virginia Tech president Jim McComas and industry in C&P President Hugh Stallard.

“The result of the study was positive,” announced Boucher, indicating that the project could move forward in Blacksburg.²⁴ Boucher focused on the “very logical partners” involved in the project, each who were, in their own ways, known for taking the lead in such high technology projects. “The success of this project is important for the entire nation that needs an advanced telecommunications infrastructure as an aide to business.”²⁵ In conclusion, Boucher noted that the Clinton administration was to be inaugurated later in the same month. The new administration had already, in January 1993, made a commitment to developing this communications infrastructure.²⁶ While it was not clear how this infrastructure would be developed, Boucher hoped that the BEV

²⁴ Videotape of Press Conference January 1993

²⁵ Ibid.

²⁶ The Clinton administration had pledged to develop a regulatory environment that would allow development of the National Information Infrastructure, popularly known as the “information superhighway.”

partnership would be a model for these new communications technology projects. “In any case,” Boucher said, “the building of this infrastructure does not need to be financed by the government. If the telephone companies are free to offer these types of services, then they can deploy those networks on their own.”²⁷ The BEV partnership was embraced by Boucher as a way to demonstrate that the business and research communities could provide the funding and resources to develop the infrastructure with only the regulatory support and advertising of the national government. For Boucher, the electronic village represented a testing ground for the development of a national infrastructure which required no national tax dollars. Mayor Hedgepath declared that Blacksburg was the ideal laboratory for this experiment and the citizens of Blacksburg, who were highly computer literate, were the ideal user community. He was proud that the experiment would occur in Blacksburg.

These government leaders demonstrated the desire to make Blacksburg a model for the 21st century village. The town government of Blacksburg could use the electronic village project to create an image of a leading edge community and a futuristic town. Blacksburg is often portrayed as an isolated town in the Appalachian Mountains²⁸ and BEV provided the possibility of a high-tech connection to the rest of the world.

The second speaker at the press conference, Hugh Stallard, focused on the importance of finding new partners to make BEV work. Stallard’s vision was one of a

²⁷Videotape of Press Conference. January 1993.

²⁸See, for example, “Wiring Dixie” in *Netguide* January 1995.

model that could be demonstrated to other businesses and towns. He announced that the partners were already making BEV a reality and that Blacksburg would become the envy of the world. The success of the project, he said, was more than just the three partners; success would depend on community involvement, the involvement of *new* partners and a regulatory environment that allowed additional freedoms. Despite the emphasis placed on the original partnership, Stallard emphasized that he envisioned this as something that would attract other companies and other partners to come and test their software and hardware in Blacksburg. Additional investment was vital to the fulfillment of their testbed town vision.

Stallard reported that following the six-month feasibility study, C&P Telephone laid 42 miles of fiber-optic cable and installed a digital switch in its Blacksburg Central Office. The company also planned to roll out an Integrated Services Digital Network (ISDN) product offering and had several trials planned, including a bulletin board system for the schools which included everything from homework assignments to PTA meetings that parents and students could access any time of the day or night. Stallard explained that participation in the BEV project was integral to Bell Atlantic's, C&P's parent company, vision for the future. Successful realization of BEV relied, for C&P, on enough users and enough additional partners and applications to allow BEV to be the testbed for the information age.²⁹

²⁹Ibid.

Stallard's image was an additional medium for commerce, a new marketplace and the opportunity for economic development in rural Virginia. It would be possible to buy and sell from the comfort of the keyboard. The electronic village could affect information consumption and production -- especially in *where* the production and consumption occur. It reinforces the image of the home as a center of production and consumption.³⁰ Stallard describes BEV as a way to test and eventually market information technologies and electronic villages to other communities like Blacksburg. Several BEV planners had a vision of marketing BEV to other small town customers.

The intention and objective of the partners is to replicate this successful network service set in other localities. This aspect, which is at the core of the project planning, forms a vital link between the investment that will be made in Blacksburg and the future market success in information technology that are vital to the future of the companies participating in BEV. In essence, BEV provides companies interested in 21st century information service markets an opportunity to tune network service offerings prior to their large-scale introduction throughout the country.³¹

Stallard reminds the other partners that BEV's continued existence was dependent on the creation of a marketplace where others want to invest.

³⁰ Ruth Cowan. More Work for Mother. Cowan discusses how the change in household technologies caused a shift from the home as a center of production (of agriculture or salable items) to a center of consumption (of services and products).

³¹"The Blacksburg Electronic Village Project." Unpublished document written by Virginia Tech and C&P BEV planners during the Feasibility Study phase of the project. (1992)

McComas, the third speaker, focused on the project as being committed to a vision of *shared knowledge*. He reminded everyone that no one could fully comprehend what would happen with the electronic village but that “citizenship in the electronic village will not require technical genius.”³² It would be a new model of cooperation, and not the traditional “town” and “gown” separation. McComas saw this project as a way to bridge the gap between the university community and the town.

Some authors who write about the Information Society, describe electronic space as a place where McComas’ collaborative ideas are taken to their extreme. In this new space, the brain is removed from the physical body so that the meeting is therefore more egalitarian.³³ This vision, a meeting of the minds, was portrayed in Dr. McComas’ descriptions of BEV as a way for the research community to collaborate on projects.

Dr. Erving Blythe, Vice President for Information Services at Virginia Tech, wrapped up the press conference by reminding the audience that BEV was to be a catalyst for economic development. It would provide the ability for Blacksburg residents to communicate with world communities and allow collaboration with others across the world. In the end, Blythe claimed that, despite the work of the partners, the residents of Blacksburg would define the village. “We are in a world where success relies on collaboration ... but in the end, the residents will define what the village is.”³⁴ While

³² Ibid.

³³ For further exploration of this concept, see [The Virtual Community](#). Howard Rheingold, especially chapter one: “The Heart of the WELL.”

³⁴ Videotape of Press Conference from January 1993.

Blythe emphasized the universal nature of BEV, he also noted that the BEV participants would play a big role in shaping its future.

Although the representatives of the partnership expressed somewhat different visions of the project, they again emphasized that the partnership was strong and the details would be worked out. The audience, which included the local press, Town Council members and Blacksburg citizens, appeared to be much more interested in the financial aspects of the project. In the Question and Answer session that followed, audience members asked about the contributions of each of the partners and the expected costs for Blacksburg residents. Stallard responded that C&P's contribution was to accelerate the schedule of switch upgrades to the area, in contradiction to earlier accounts that the switch upgrade was not a part of the BEV project. As a comparison, he said, C&P had 350 million dollars available for upgrades within the entire state of Virginia and that six million dollars had been spent in Blacksburg to cover the new switch, the fiber optic cabling and incremental costs for the ISDN trial. The company planned to spend more as new partners were identified. Virginia Tech's response, given by Blythe, was that they had developed and assembled the software for the project and worked with the potential user community so their contribution was in having salaried employees spend time and resources on the project. He claimed those costs were difficult to name explicitly. None of the partners estimated future costs. As for membership costs for Blacksburg residents, Stallard responded that there would be no charge for trials like the

school system, but would be for things like ISDN products. Blacksburg residents would be subject to the same charges as other residents of Virginia.

One questioner asked who was expected to become a future partner in the project. A Virginia Tech representative explained that they envisioned software and hardware vendors who wanted a connected user community to test their wares as future partners. However at the time of the press conference, no-one had been identified. Virginia Tech employees planned to work on outreach following the assurance and announcement that the BEV project would move forward.

This press conference represented a unified excitement about what the BEV project could entail, but also clearly demonstrated that each of the partners had different goals and expectations for the project. Each of these visions -- Blacksburg as a model for the wired country, an economic development project, and a project to share knowledge -- was important to and influenced the project. However, none of these visions really included the insight of the residents who would become electronic village citizens. Despite Blythe's concluding statements about the importance of the user community, Blacksburg residents had primarily been observers and questioners at the project press conferences.

IV: Looking for the Villagers

Once the partnership was established, BEV designers had to decide whom to target as consumers and participants in BEV. Robert Heterick described the project at the 1992 press conference as a real-world “Field of Dreams” scenario. The planners thought that if they built it, Blacksburg residents would come.¹ The partners planned to build BEV for everyone but counted on residents to come online on their own initiative. BEV designers created a new place and were fairly certain that there was a potential audience who would help shape the project. They targeted an entire town, and waited to see who was interested and who wanted to invest time in shaping the future of the project.

Critical Mass

The BEV designers counted on a “critical mass”² of participants in order to do field trials of software and hardware. Attempts to reach a critical mass of users led journalists to describe Blacksburg as a totally wired town. Phillip (Theta) Bowden, Director of Project ENABLE, the Virginia Tech Administrative Systems Initiative, described the achievement of a critical mass in the document “The Blacksburg Electronic Village Partnership.”

There will be so many folks utilizing data connections that people will assume the availability of a network connection as a given. Teachers and

¹Videotape of Press Conference January 1992.

²For further discussion of “critical mass,” see Weincko, Joseph. “The Blacksburg Electronic Village.” Internet Research. Summer 1993

doctors will utilize the net in their everyday interactions with parents, students, and patients. Local businesses will naturally want to use the net to ply their wares ... and new services will emerge, many of which have no analog in the current service provision environment.³

In this planning document, designers express the desire to include all Blacksburg residents in BEV, in order to increase and equalize residents' participation in the town's new online marketplace. However BEV's audience was defined differently in each of the early visions of the project. For the shared knowledge vision, they were disembodied minds. For the marketplace vision, they were consumers. For the futuristic town vision, they were citizens and subjects for experimentation.

Following the press conference there was still a great deal of work to do to prepare for the fall opening. Each partner had a variety of responsibilities and jointly they had to make decisions about how the electronic village would be implemented. Bowden described four key design features of the project.⁴ First, the project was a service provider, not a technology trial. Because the project was not tied to any particular technology, they could focus on the services they provided. This was in contrast to some of the telephone company-run testbed towns where the focus was almost solely on the technology being tested and the business case for the company sponsoring the trial.⁵

³Theta Bowden. Unpublished document "The Blacksburg Electronic Village Partnership" October 1993.

⁴ Ibid.

⁵For example, other corporate sponsored technology trials during the same time period were GTE's Cerritos Project in Cerritos, CA and the Bell Atlantic and New Jersey Bell Princeton Gate Fiber-to-the-Home trial in South Brunswick, NJ.

Second, they wanted to encourage all sectors of the community to participate in the network -- schools, government, local businesses. This was in contrast to some of the existing community networks, which focused on the private citizen.⁶ The project planners saw the business community and schools as integral to the project. Third, Bowden and other project team members created a network-based service instead of a host-based service. This distributed the work of BEV across a network instead of on to a few servers like a bulletin board system (BBS).⁷ Fourth, they hoped to achieve a “critical mass” of users -- admittedly a vague term. The goal was to create services that became so commonplace that residents would not know how they had gotten along without them. BEV, they hoped, would become like the FAX machine or telephone, something that became an integral part of village life.

The creation of a network solely for Blacksburg was never really a design option because two of BEV’s goals were to have the widest access possible to allow for greater economic development and to connect an isolated community to the outside world for the purposes of shared knowledge. The choice to connect Blacksburg to the outside world also reflects this initial image of Blacksburg as an example for the nation in setting up a worldwide and futuristic village. BEV was imagined as the first of its kind. Virginia

⁶The WELL in the San Francisco Bay area and ECHO in New York City, for example, were designed to encourage communication and exchange between its members rather than providing static information.

⁷A Bulletin Board System is a scaled down version of a networked community, often run by an individual on a single computer. A BBS might provide local or special interest information. Multi-User Sessions in Community (MUSIC) in Dorchester, MA is an example of a BBS developed for a neighborhood.

Tech employees planned to eventually provide advice and consultation to other communities hoping to develop similar projects.⁸

Although, each of Bowden's design features could have been fulfilled with a local network, BEV designers also wanted to help Blacksburg gain a world-wide reputation. They made connection to the outside world a vital part of their initial package of services.⁹ As an economic development project, an Internet connection would benefit the local business community by allowing them to communicate with clients, employees or business partners in other parts of the world. The BEV designers also wanted to provide the townspeople and off-campus students, faculty, and staff with the same access that was available on campus, including Internet service. This would also allow for the shared knowledge vision, with access to researchers in other areas.

Over the summer of 1993, Bell Atlantic installed Ethernet connections in four apartment complexes and their central office, and installed a ten Megabit per second (Mbps) connection to the campus. Virginia Tech employees continued to develop the software package including connection establishment software, to make connecting through the modem pool easier. Virginia Tech employees set up a high speed modem pool and provided on-campus students with Ethernet capability. In October of 1993, the BEV office was in operation and in November, they began to distribute software. At that time, the software only ran in DOS, with Mac and Windows software planned for the

⁸The hope of providing electronic village consulting has come to pass for Virginia Tech employees. There is a section on the BEV homepage with information and classes for starting an electronic village.

⁹Videotape of BEV Press Conference 1992. Presentation by Joe Wiencko included multi-tiered service for BEV which always included Internet connection.

following year. The Virginia Tech computing center had recently decided to encourage campus members to use Macintosh computers. Those interested in the electronic village went to the office, in Virginia Tech's research park, to pick up their software and pay an \$8 registration fee.¹⁰ There was also a monthly charge of \$8.60 for high-speed modem pool users and \$5 for Ethernet and low-speed modem users.

In January of 1994, the Blacksburg branch of the Montgomery-Floyd County Library installed seven computer stations so that any resident of Blacksburg could have access to BEV as easily as they could get a library card. The library was able to offer these services free due to the assistance of a federal grant, a hardware donation from Xyplex, Inc. and a phone line installed by Bell Atlantic.¹¹ Andrew Cohill, new BEV project manager commented, "The project is really about people, about community, about asking questions ... about libraries better serving the community."¹² This was an attempt to encourage community involvement in BEV by making access available to everyone and free of the registration and modem pool charges.

Cohill focused on the importance of involving people in creating a BEV community. When some writers discuss the electronic village, they think back to a time when people had strong connections to their neighborhoods or towns. Like Cohill, they hope that the electronic village can reinvigorate those ties. In the January 1994 issue of

¹⁰Yarbrough, Beau. "The future is now: Electronic Village is open to the public." The News. November 28, 1993.

¹¹Foster, Stephen. "A ride on electronic streets." Roanoke Times and World News. New River Current. January 15, 1994.

¹²Ibid.

Communications of the ACM, Doug Schuler, guest editor and Advanced Computing Technologist in the Collaborative Computing department at Boeing Computer Services, observed that while "the community network movement with its great potential for renewed participation in community life is rapidly gaining momentum ... the realization of this potential will depend on active, compassionate, creative, and persistent participation of computer professionals and others in technical, social and political roles."¹³ Schuler is clearly making a call to the computer science community to volunteer to create a particular version of the electronic village -- one built on strong connections to the village replayed in electronic form.

While this image appeals to small-town nostalgia, it is an image that BEV builders said could only be realized through the actions of BEV's participants. While Blythe suggested that BEV could renew community life in Blacksburg with his statements at the 1993 press conference. However, a communal construction became a more prominent image after the basic services of BEV were available and more of the community went on line. BEV planners hoped that the local community would take the project over and make this vision happen. They felt that this was not something that could be "designed in," but rather something that had to come from the community.

In the April "About Town Magazine," a Blacksburg monthly magazine, BEV administrators made a call to the community for participation in BEV. Developers hoped that residents would begin to take an active role in defining and designing BEV. They

¹³ Schuler, Doug. *Communications of the ACM*. "Community Networks." January 1994.

planned to move into more of a support role rather than developing new aspects, hoping that the local community would take a leading role. The results of a town-wide survey by Dr. Andrea Kavanaugh, BEV Director of Research and a Virginia Tech employee, and Dr. Scott Patterson, Assistant Professor of Communication Studies at Virginia Tech, indicated more of an interest in local news, commercial services and entertainment¹⁴ rather than the connection to outside and world-wide services, as planners had suspected.

C&P began providing ethernet service for students in apartments as part of a marketing test that took place over spring semester of 1994. There was no cost for the ethernet connection but at the end of the semester C&P surveyed the apartment residents as to how much they would be willing to pay. They hoped to determine a pricing scheme for projected wiring of other apartment complexes. Meanwhile BEV developers at Virginia Tech continued to work out bugs in the software and determine why people had a hard time getting on to the network through the modem pool. They began doing training and trouble-shooting over the phone. The BEV project was still an experiment and was still being built.

Cohill, Wiencko, and representatives from Bell Atlantic hailed the project as successful by the end of the spring semester 1994, but admitted that there was still a ways to go. The software was still difficult for people to use, modems were slow, the financing was still unclear, and no new partners had signed up. Bell Atlantic had made its initial

¹⁴ Kavanaugh and Patterson received 332 responses to the surveys sent to the entire town via the About Town Magazine. Users were polled as to their uses of BEV and for suggestions of additional services.

investment and was trying to determine if there was enough of a market to keep their interest. Some looked to the business community to play a role in the financing and use of services. BEV project leaders also looked to the Blacksburg community for the direction of the project. Kavanaugh commented, “The community really has to take charge if it wants to get a lot out of it.”¹⁵ BEV designers hoped that BEV members would not only join but would become designers and advocates. They felt that by providing the technology they had enabled the possibility for the kind of community participation suggested by Schuler. However it was still difficult at that time for residents to participate any more than by simply going on line, filling out some of the surveys, participating in town-wide discussion groups, or participating in focus groups. There were few volunteer opportunities or chances to participate in the design process.

Out of the Laboratory

Over the summer of 1994, Rick Boucher organized a teleconference at Virginia Tech to show off the BEV as a model for other communities. At this conference, Bell Atlantic president Jim Cullen proclaimed that the project was not an experiment but “an application... It demonstrates we can move out of the laboratory and into the real world.”¹⁶ This conference also included officials from the Federal Communications Commission (FCC). FCC Chairman Reed Hunt commented, “This public-private

¹⁵Foster, Stephen. “Road still a bit rough to info-land.” Roanoke Times and World News. April 5, 1994.

¹⁶ Associated Press. “FCC says network is model system for communities.” The Journal. July 19, 1994.

partnership sets an example for the rest of the nation.”¹⁷ BEV was imagined again at this conference as a testbed for the country and proclaimed a viable application, ready to leave the laboratory.

By the end of the fall of 1994, on its first official birthday, BEV included more than 1000 homes and 40 businesses.¹⁸ While they still attempted to get the local community involved, BEV administrators also began exploring local business use to encourage the growth of BEV. Doug Mauer, one of the founders of BizNet, a consulting company which helps businesses go on-line with their services, was involved in BEV almost as soon as they opened their doors. Looking back, Mauer commented,

We all had the dream of getting pizza on the Net ... Initially it was more of an advertising thing and a way of interacting with the customer more directly via email ... So the exciting thing for me was that people could interact directly with their clients for feedback as well as advertising and being able to put up essentially unlimited information ... it's really cheap.¹⁹

The business community began to use services like on-line advertising in the Village Mall, a World Wide Web page.²⁰ The Village Mall was similar to an on-line yellow pages for local businesses and was available to all local businesses at no cost. Bogen's Restaurant installed a Pentium computer in its bar, and billed itself as the first Blacksburg

¹⁷ Ibid.

¹⁸ Reed, David. "Happy 1st birthday to Blacksburg Electronic Village." Roanoke Times and World News. October 26, 1994.

¹⁹ Interview by David DeVaux with Doug Mauer. November 1995.

²⁰ The BEV Village Mall address is <http://crusher.bev.net/mall>.

cyberbar, allowing patrons to surf the Net while they had their food and drinks. Listings on the Village Mall started to include links to businesses' WWW pages that included coupons and daily specials and even the possibility of ordering some products via email.

During 1995 nearly a dozen local consulting firms established themselves in the Blacksburg area to help businesses go on line. They provided WWW design services, offered space on computers to store information, and helped businesspeople and local organizations learn what they could do with the Internet and BEV. By the end of 1995, there were fourteen such companies, twelve of them founded in 1995. Nearly one third of Blacksburg businesses had a listing on BEV's Village Mall. While business owners said they hadn't seen increased business due to their ads they thought that the cost was low enough to warrant gambling on future success.²¹

As membership grew on BEV, the local business community and consultants became more involved. Blacksburg residents also became involved as volunteers in the BEV office or in creating Web pages and local electronic mailing lists. During this period, BEV administrators, especially at Virginia Tech, continued to focus on the importance of the local services. "What we've found out is that nobody cares about the vast resources of the Internet. There's a certain novelty item when you first get connected, but if you think about it what people do in their daily lives, they tend to be focused on activities close to home," said Cohill.²²

²¹ Based on interviews by Jongwon Park, David DeVaux, Mike Duckett, and Mark Missana with six Blacksburg business owners in the fall of 1995. These interviews were conducted for part of a final project for computer science course 6704: Network Community: Community Networks.

²² Farragher, Thomas. "Electronic Village, U.S.A." San Jose Mercury News. May 1, 1995.

From Partnership to Product

In the spring of 1996, the original BEV project partnership of industry, academia and government appears to be fading. Although it seemed initially to be a partnership in name only, now it seems that it is not even a partnership in name. There were several moves by the university to separate services for the town from services for the students, staff and faculty of Virginia Tech. While there is still a BEV group at Virginia Tech, the university has moved to providing modem services only for its paid employees and for its paying students. Bell Atlantic continues to provide the underlying infrastructure, but has also devoted less time to the project so that now their primary role is in maintenance of the lines and switches that they normally would maintain for telephone usage. Bell Atlantic became more active in other technology trials and did not invest further in Blacksburg and the future partners they had envisioned did not materialize. The town continues to be an information provider, and maintains its WWW page with town information. Overall, the excitement for the project, at least by those who determine financial and personnel allocations, has died down. Local enthusiasts continue to make things work through volunteer hours and local efforts. As resources from Virginia Tech and Bell Atlantic have been pulled away, a large number of small businesses have come in to fill in some of the void. The project has moved from a partnership of big institutions united to create an economically strong America to a loosely defined structure held together by a smattering of small entrepreneurial companies, work groups within the

original institutions and volunteers. The BEV builders' struggle to involve the local community has begun to see some success.

University: Off-Campus Service Provider

Virginia Tech has returned to its motivation of providing service for off-campus university members. In late fall of 1995, NRVNet became the first local company to provide inbound modem pool access. Citizen's INTERNet Service also began offering service in the Blacksburg area. Following these company offerings, Virginia Tech's BEV office posted a notice to all BEV members in early 1996 that those who were not affiliated with Virginia Tech would have to find another modem pool service by July 1996. A press release from March 8, 1996 stated, "Beginning March 15 the university will no longer accept non-Virginia Tech applications for modem pool use. Current BEV subscribers will have until July 1 to affiliate with private Internet providers such as NRVNet ... or Citizen's Internet Service."²³ The Virginia Tech administration declared the project was so much of a success that they needed to allow some of the local industry to participate in and capitalize on that success. In the same announcement, Blythe stated,

The first part of our experiment is finished -- we sensitized the community to the possibilities of electronic information access and created a market.

There are even several new local companies designing web pages. Now we need to focus on discovering new ways to use this technology to forge

²³Online announcement of policy on BEV homepage message of the day. "Another BEV Milestone."

strong communities. This will also allow us to focus more time and energy on Internet education and training. It's what the community is demanding of us now.²⁴

While the Virginia Tech BEV office continues to operate many services available to the community such as the World Wide Web server, and continues to perform the administration of day-to-day operation, many in the community felt that they had been abandoned by Virginia Tech when they were "kicked off" of the modem pool.

The community was informed in a Frequently Asked Questions (FAQ) segment of the same announcement that they would still be a BEV member based on their residence in Blacksburg. However, there was still confusion about what it meant to be a BEV member and one person described the move as being "shoved out of the nest."²⁵ In the same FAQ about the new policy, BEV administrators explained what it means to be a member:

The BEV is the idea of citizens gathering online, solving problems, making friends, discovering something new. BEV doesn't depend on particular hardware or software, it just can't be bought or sold. It's about people, not technology. It doesn't matter how you get online, just that you do!²⁶

²⁴Ibid.

²⁵Personal email from Blacksburg resident in relation to Focus Group participation.

²⁶Online announcement of policy on BEV homepage message of the day. "Another BEV Milestone."

While the university claimed that the plan had always been to encourage other service providers to provide modem pool access, they underestimated the perceived split that many townspeople felt.²⁷ The decision to limit modem pool access to Virginia Tech-affiliated persons seemed to some town residents to draw a line around who could participate in BEV. Despite proclamations of success, this represented to some townspeople another instance of the divide between the university and the surrounding community

The policy change created a division that some townspeople interpreted as an indication of BEV's desired audience. In the newsgroup bburg.general²⁸ one person, who was affiliated with Virginia Tech, responded to a comment by a fellow BEV member. The first member wrote, "NPR [National Public Radio] had a long feature about BEV on its morning news program today. Quite good and pretty complimentary." The reply indicated frustration with some of the hype surrounding the project and a sense of unfairness,

Yes, I heard it, and I about choked on my breakfast when the reporter continued to foster the completely false impression (which of course serves the PR needs of the BEV) that "access is incredibly cheap, available to EVERYONE in town for only \$8 per month, which is much

²⁷In the focus groups about the BEV, held April 21-30, 1996, several Blacksburg residents who had agreed to participate refused after the March announcement. Others who did participate were upset by what appeared to them as an abandonment of the local non-university community.

²⁸The bburg.general newsgroup is used by BEV members for a wide range of discussion topics ranging from how to quiet a neighbor's noisy dog to arguing over the best restaurant in Blacksburg.

lower than any other Internet access service” (or words to that effect). A description of how people can email their requests to K-92 (or some station) was offered as ‘proof’ of the ubiquitousness of Internet access in Bburg.

Note to the paid BEV staff: next time, see what you can do to give the reporters a true picture of how the BEV currently works, and the fact that “cheap” access is now only for people associated with Tech.²⁹

While BEV membership remains available to all residents of Blacksburg, a separation of town and university services indicated to many people a change in levels and quality of service and a separation of the university from the town. BEV staff, however continue to conceptualize BEV as universally accessible and to rely on the community to participate. It is only with this continued community participation that BEV can reach its stated goal of “critical mass” and continue to survive.

In the spring of 1996, Virginia Tech also scaled back its commitment to personnel for the BEV project, relying more heavily on the project’s core of volunteers. It appeared that Virginia Tech was providing BEV service for the university community similar to the way it provided other campus services such as telephone and ethernet connections.

²⁹Post to bburg.general on April 11, 1996 in response to original post of April 10, 1996.

Industry: Where is the return on investment?

In the early stages of the project, there was hope that the project would draw interest from large companies like IBM, HP and Microsoft as a testbed for new services and products. The project partners thought there would be ample opportunity for new partnerships and even the opening of branch offices in Blacksburg. For a variety of reasons, this never occurred except in the form of small local consulting companies. Andrew Cohill suggested one reason why that did not happen,

Someone from IBM told us that nothing we're doing in Blacksburg has any relevance because we're not charging for the service. Our electronic mail service is free. Our web service is free. I think that's a very short-sighted view but that does seem to explain why we've had such little interest. There's a view that community networks have very little to do with design and sale of commercial networks. I don't agree with that attitude but that's at least what one large software and hardware company believes.³⁰

Cohill suggests that BEV members had not been modeled as consumers in the eyes of other companies. Others suggested that Blacksburg's location in a rural area hindered investment due to the expense of investing in an area that was not easily expandable as a trial in a metropolitan area. Another suggestion was that Blacksburg did not stay technologically ahead of other towns and cities so that companies were discouraged by

³⁰ Interview by Jongwon Park with Andrew Cohill. November 1995.

the lack of bandwidth for trials that might have included video and other high-end products.

Bell Atlantic, the industry component of the original partnership, continues to be involved in maintenance and for fee services like wiring apartment complexes with ethernet, but has not taken any recent steps to invest or initiate more than their initial contributions.³¹ In retrospect, Dave Webster of Bell Atlantic said of Bell Atlantic's role,

You might characterize it [BEV participation by Bell Atlantic] as investment in both community and investment in relations with the university. Also in the political structure and then additional investment in the technology and what we can learn from playing the role of providing the transport for university services for off-campus environments as well as being the transport for the community for their, quote, electronic village.³²

As the project proceeded, Bell Atlantic began to see their participation in the project as more of a political investment than one that would pay off financially. In an interview in February of 1995, Bob Morris, the Bell Atlantic employee who was responsible for the feasibility study, acted as liaison to the university and town, and even relocated to the Blacksburg area for a short period to work on the project, commented on the challenges ahead for BEV.

³¹The Telecommunications Act of 1996, passed in February 1996 may allow Bell Atlantic to provide additional services like access to the Internet and compete directly with some of the local businesses, but that remains to be seen.

³² Interview with by Jongwon Park with Dave Webster. November 1995.

I think the main thing for me ... has been over the last six or seven months maybe even the last year, to get the company to recognize maybe this is something that Bell Atlantic would want to be a part of and it does have that economic, you know, viability where it could be moved to other places. I think my greatest challenge has been internal as opposed to external.³³

Over the life of BEV, the telephone company had been through significant changes in reaction to changes in the telecommunications industry. The instability in the telecommunications industry and changes in leadership certainly affected the company's relationship and commitment to the project. This caused other members of the partnership to feel that the phone company had stepped out of their initial promises. This may only be a reflection of their early commitment to participate with new partners who never appeared, or it may be Bell Atlantic's desire to ensure that BEV would be an economically viable project for them before making further commitments. Morris' comment reflects that internally Bell Atlantic did not believe that the investment would be worthwhile.

All three of the partners have encouraged local business community involvement in BEV and the town even provided some financial support for them to do so. Over the summer of 1995, the Town of Blacksburg provided a \$15,000 economic development grant to the Blacksburg Electronic Village, Inc. This money was to be distributed to

³³Interview by John Schorger with Bob Morris February 28, 1995.

assist businesses within the town limits to establish or improve their WWW listings in the Village Mall. Forty-seven grants, ranging from \$90 to \$390 were awarded in fall of 1995.³⁴ Ron Secrist, Town Manager of Blacksburg, suggested the grants as a way to assist some of the smaller businesses and ensure that there be a variety of online businesses. "I was looking at ways to use the funds that would enhance the average citizen's interest in using the electronic village. And I came to the conclusion that the more information and the more variety that's available to citizens, the more reason for the citizen to sign up and use it."³⁵

BEV, Inc. board members had a variety of goals in awarding the grants. One board member explained,

My real focus was ... enhancing businesses that brought money in from outside of the town -- that's the real economic development. That's called a basic industry kind of thing ... You don't want to just circulate money inside of the town as a lot of the local businesses do. But the real goal was to bring money from somewhere else in to town.³⁶

Many local businesses learned about the grants and called upon the assistance of local Internet consultants to help them establish an online presence with the grant money. Therefore, along with encouraging electronic commerce by existing businesses, an

³⁴For a list of the winners, see gopher://gopher.bev.net/00/BevBus/Grant.Awards.txt

³⁵Interview with Ron Secrist by Jongwon Park. November 1995.

³⁶Interview with Ken Anderson by Jongwon Park. November 1995.

unforeseen consequence of the grants was the proliferation of small consulting businesses in Blacksburg.

These small companies have mostly been founded since early 1995. Many have started with customers in the Montgomery County (Blacksburg's county) area and have branched out to include customers across the United States. Some companies provide server space and advertise themselves as one-stop shopping for creating an online presence. These small companies provide consulting required to involve the business community as well as user training, modem access, server space and software distribution for the townspeople. For example, NRVNet now provides a software package which performs connection services, as does the BEV software. It will be interesting to see how many of those companies will survive over a longer period of time.

Government: An Attractive Add-on

The local government has continued its role as information provider and advertiser for the BEV project and provides some administrative structure. Town leadership has worked to involve Blacksburg residents in contributing to and participating in the BEV project. Secrist said,

My initial vision and I can only speak for mine and the town's .. our initial vision was to use the electronic village ... as a means of enhancing communications between the citizens of the local community and their government ... that was it. We saw the potential for increasing our ability

to communicate with our citizens ... Secondly, we saw it potentially as a means of developing new business in the community ... because if we were able to put together the electronic village in a time that made us unique among other communities in this part of the state .. or in the country, it would draw attention to Blacksburg because its a place on the cutting edge or the frontier of technology.³⁷

Secrist saw BEV as adding a new layer to town activities, making Blacksburg an attractive location. The town contributes to the BEV project through such projects as the economic development grants which were made possible through local tax dollars. The town has not, nor did it plan to, taken a leadership role in the BEV project. Town management personnel see the project as a nice add-on to an existing community and as a way to attract potential residents and businesses, but it does not yet see BEV as so necessary that it should be administered by the town. Despite the town's addition of a WWW address to its municipal building street address, sewage and trash collection are obviously higher priorities than administration of BEV.

The two organizations who initially took the lead, Virginia Tech and Bell Atlantic, seem to be stepping out of their leadership roles, leaving space for smaller companies and Blacksburg residents. While the image of a united threesome of industry, university and government seems to have faded, something else has replaced it. This threesome did their work to create a marketplace in Blacksburg. However, as some

³⁷Interview by Jongwon Park with Ron Secrist. November 9, 1995

outside companies have pointed out, they created a marketplace with rates that were too low to be attractive to other potential industry partners.

BEV builders at Virginia Tech struggled to involve the community in many ways through the public access at library, free WWW space, courses and technical assistance. However, they found it difficult to determine how the villagers could play a role. By creating the technical space first and then inviting the community to come, they created a scenario which was better suited to a marketplace model. They found themselves in the role of sellers with the community members as buyers. Instead of incorporating the villagers into the village early on, the partners concentrated on the articulation of their own visions and built the village first.

V: Conclusions

Multiple Visions

A new technology often starts as a conglomeration of visions, dreams, hopes, and assorted equipment. Popular representations and even science fiction inspire the development of new technological projects like the electronic village. This imagining and envisioning is an important aspect of the development process. The visions, while they sometimes oppose and conflict with one another, are important guides for working out what the technology becomes. In some cases the visions with the loudest advocates win out, in other cases a technology seems to “naturally” support one of the visions, and in other cases it is not clear why one vision wins.

BEV has developed into a variety of things, but certainly not into everything designers and participants described at the early press conferences. BEV’s formation resulted from technical and policy choices, strong personalities, financial considerations, and, in some cases, the work of a few volunteers. Those choices and visions renovated the Blacksburg Electronic Village in ways that caused some visions to appear strongly and others to disappear. I do think this kind of a project has the potential to support a variety of images simultaneously. However, the BEV project staff has to, due to time constraints and limited financial resources, emphasize some visions over others.

Some of the choices made by designers provide examples of how one vision is given prominence or left behind. For example, BEV designers made an early decision

about whether or not to include Inter-Relay Chat (IRC) software or Multi-User Domain (MUD) software which allow synchronous interaction. They initially choose to have only asynchronous communication, like email and newsgroups. This decision made it more difficult to realize the vision of working together online. While collaboration does occur through electronic mail and newsgroups, the initial image was one of groups working together in real time. As Dr. McComas described at the second press conference, the partnership was committed to a “vision of shared knowledge,”¹ where researchers from around the world could work together. In the fall of 1995, a group of graduate students developed MOOsburg, a Blacksburg MUD.² MOOsburg allows online exchange, although at this point it is more of a social meeting place than a place for online collaborative work and shared knowledge. The MOOsburg project and others like it could reinvigorate this vision of online collaboration or shared knowledge.

Mixed in to all the hype about the electronic village and the multiple visions that it represents, the image of a new marketplace is often the easiest to realize. By making a separation between builders and users or between technology and society, we model villagers as consumers. As happened with BEV, the village was built and then the consumers were sold the product, rather than allowing villagers to design the village themselves. The marketplace is often presented as the vision that will allow an electronic

¹Videotape of Press Conference. January 1993.

²MOOsburg was initially created by Jon Kies, Brian Amento, Craig Struble and Mike Mellott for Computer Science graduate seminar CS6704 . It is located at <http://hci.ise.vt.edu/~jkies/Moosburg.html>. A MOO (MUD Object Oriented) is a MUD that allows participants to interact with virtual objects that they can manipulate as well as with other participants.

village to be self-supporting through advertisers and online commerce. Although I do not think that the other visions will disappear simply because of online commerce, visions of collaborative work or community connection are more difficult to realize in a marketplace model.

The electronic village in Blacksburg has created a new market for information technologies and has the potential to implement other visions. However, the technical and policy decisions made regarding the building of BEV primarily reflect the market vision. An electronic village, to be successful, incorporates and acknowledges a variety of visions because it is based on an existing physical village where there are also a variety of expectations and understandings. If visions of community connection or collaboration are really part of the electronic village, they need to be included in design decisions. BEV, because the original partners are not doing as much new development of services and tools, has begun a new phase where villagers can be more active as developers.

A Role for Villagers

The combination of commercial interests, town image, and community activism is not something newly created by the electronic village. The interplay of these kinds of images already shape traditional villages and communities. Due to the large donations of time and money by individuals, organizations, and government agencies, the electronic village can be a representation of a community. However, BEV can only serve as such a

representation if residents participate in building the electronic village and designers attempt to include that image in the project.

The electronic village does represent a chance for renewed participation in community life. From the focus groups³ and observation of some of the community discussion groups, my impression is that BEV does provide a feeling of attachment for those who invest a significant amount of time in creating an online community. BEV villagers achieve this either by participating in the design of a project⁴ or spending time with other villagers both online and face-to-face.⁵ However, community involvement is not something that comes automatically as a result of participating in BEV. BEV allows another way to create a community feeling, but not without work

I suggest incorporating a vision of community life into such a project. For example, the use of collaborative design for building components of the village or providing grants like the economic development grants but focused on community organizations and development projects could add that dimension to BEV. Groups like the BEV Seniors have created very active areas of BEV through the work and participation of the group's members. Instead of understanding the electronic village as something that can be packaged and implemented as is to other places, village builders should allow villagers to customize and develop their electronic village.

³Focus groups were held in conjunction with Dr. Scott Patterson's research in April 1996.

⁴ Several projects have involved community members in designing a part of the electronic village. For example, Stuart Laughton's dissertation work in building applications for teachers in the public school system involved Blacksburg teachers in the design process.

⁵ The BEV Senior group is very active and has created a community for many of its members by providing housecall service to help other senior citizens install and learn to use communications software.

I admire the work that BEV designers did and can see that there were a variety of motivations for building BEV -- including a desire to involve the Blacksburg community. It also appears to me that BEV designers wanted the community to take control of making the village grow. However, the designers struggled with trying to fit the villagers into their visions after the village was built. When these visions and the different roles for villagers became difficult to mediate, they fell back on a marketplace model, which was easier to manage. With the image of a partnership project fading, BEV has entered a phase where there is a possibility for interested groups and individuals to participate in revising the electronic village.

In conclusion, I raise questions about designing a technological project for a town. The electronic village is a special kind of technological project because it is overlaid on an existing community and must support a variety of pre-existing visions and understandings of what it is. How do you incorporate the visions of the user community into the design process? How should such a project be managed? Who should do the managing? Who should do the designing and building? Who should fund such a project? Which parts of a village does such a project represent? How do participants become interested without using a marketplace model? Why should someone spend time in an electronic village instead of a real one? Why should we believe that this new medium will instigate participation in a community? While I do not offer answers to these questions, acknowledgment of various visions and active involvement by the villagers can help to address these questions in designing other electronic villages.

BIBLIOGRAPHY

“The Electronic Village.” Virginia Town and City, October 1994: 60.

“One-fourth of Blacksburg now on-line with BEV.” Roanoke Times and World News, 22 January 1995.

Associated Press. “FCC Says Network is Model System for Communities.” The Journal, 19 July 1994.

Associated Press. “Living is easy in the Blacksburg Electronic Village.” Daily Press, 24 October 1994.

Beamish, Anne “Communities On-Line: Community-Based Computer Networks.” Masters Thesis. Department of Urban Studies and Planning. Massachusetts Institute of Technology, 1995.

Beniger, James R. The Control Revolution: Technological and Economic Origins of Information Society. Cambridge, MA: Harvard University Press. 1986.

BEV Staff Members. “The Blacksburg Electronic Village Project.” Unpublished Planning Paper. 1992.

Bijker, Wiebe E. and John Law (eds.) Shaping Technology/Building Society. Cambridge, MA: The MIT Press. 1992.

Bijker, Wiebe E., Thomas P. Hughes, and Trevor Pinch (eds.) The Social Construction of Technological Systems. Cambridge, MA: The MIT Press, 1987.

Boucher, Rick. “Cable Competition Vs. Cable Regulation: Rethinking the Cable Utopia: Competition Versus Regulation in the Video Future.” White Paper. 22 February 1990.

Bowden, Phillip and Joseph Wiencko. “The Blacksburg Electronic Village Partnership.” Unpublished. October 1, 1993.

Bowers, John. “Wiring Dixie.” Netguide January 1995: 48-53.

Callon Michel and John Law. “The Life and Death of an Aircraft: A network Analysis of Technical Change.” Shaping Technology / Building Society. Eds. Weibe Bijker and John Law. Cambridge, MA: The MIT Press, 1992. 21-52.

Cowan, Ruth Schwartz. More Work for Mother: The Ironies of Household Technology from the Open Hearth to the Microwave. New York: Basic Books, Inc., 1983.

Dellinger, Paul. "Bell Atlantic wants to bring Internet to Southwest Va.: Congress must first lift long-distance restrictions." The Roanoke Times and World News. 25 July 1995.

Downey, Gary Lee. "The World of Industry-University-Government: Reimagining R&D as America." Technoscientific Imaginaries. Ed. George E. Marcus. Chicago: University of Chicago Press, 1995. 197-226.

Dunlop, Charles and Rob Kling(eds). Computerization and Controversy: Value Conflicts and Social Choices. New York: Academic Press, 1991.

Dutton, William H., Jay G. Blumler and Kenneth L. Kraemer(eds). Wired Cities: Shaping the Future of Communications. Boston: G.H. Hall and Co., 1987.

Farragher, Thomas. "Electronic Village, U.S.A." San Jose Mercury News. 1 May 1995.

Fisher, Anne B. "What Consumers Want in the 1990s." Fortune Magazine. 29 January 1990: 108 - 112.

Foster, Stephen. "A ride on electronic streets." Roanoke Times and World News. 15 January 1994.

Foster, Stephen. "Road still a bit rough to info-land." Roanoke Times and World News. 5 April 1994.

Gilster, Paul. The Internet Navigator: The Essential Guide to Network Exploration for the Individual Dial-up User. 2nd ed. New York: John Wiley and Sons, Inc., 1994.

Guthrie, Kendall K. and William Dutton. "The Politics of Citizen Access Technology: The Development of Public Information Utilities in Four Cities." Policy Studies Journal. Winter 1992: 547-597.

Harrison, E. "Virtual Village Opens Up Alternative Reality for Townspeople" Los Angeles Times. 16 May 1995.

Jilk, Linda F. "Electronic village could be reality by '93." The News Messenger. 9 June 1992.

Kroker, Arthur and Michael A. Weinstein. Data Trash: The Theory of the Virtual Class. New York: St. Martin's Press, 1994.

Latour, Bruno. Science in Action. Cambridge, MA: Harvard University Press, 1987.

Marchman, Jim. "Electronic village may need fireflies." Roanoke Times and World News. 24 February 1994.

Martin, Emily. Flexible Bodies: Tracking Immunity in American Culture From the Days of Polio to the Age of AIDS. Boston: Beacon Press, 1994.

McCue, Cathryn and Madelyn Rosenberg. "A look into the future." Roanoke Times and World News. 21 January 1992.

Miller, Steven. Civilizing Cyberspace: Policy, Power and the Information Superhighway. New York: ACM Press, 1996.

Mitchell, William J. City of Bits. Cambridge, MA: MIT Press, 1995.

Postman, Neil. Technopoly: The Surrender of Culture to Technology. New York: Random House, 1992.

Poster, Mark. The Second Media Age. Cambridge: Polity Press, 1995.

Reed, David. "Happy 1st birthday to Blacksburg Electronic Village." Roanoke Times and World News. 26 October 1994.

Rheingold, Howard. The Virtual Community: Homesteading on the Electronic Frontier. Harper Perennial, 1993.

Rosenberg, Madelyn. "Plan would change fiber of Blacksburg." Roanoke Times and World-News. January 18, 1992.

Rosenberg, Madelyn. "Blacksburg users anticipate linking as 'computer village.'" Roanoke Times and World-News. 3 September 1992.

Roszak, Theodore. The Cult of Information. New York: Pantheon, 1986.

Schuler, Doug. "Community Networks: Building a New Participatory Medium." Communications of the ACM January 1994: 39-51.

Shirky, Clay. Voices from the Net. Emeryville, CA: Ziff-Davis Press, 1995.

Smith, Dan. "Electronic Village: Technology Showcase." Blue Ridge Regional Business Journal. Special Section on Business Communications. February 1992: 15.

Sproull, Lee and Sara Kiesler. Connections: New Ways of Working in the Networked Organization. Cambridge, MA: The MIT Press, 1991.

Stoll, Clifford. Silicon Snake Oil. New York: Doubleday Press, 1995.

Turkle, Sherry. Life on the Screen: Identity in the Age of the Internet. New York: Simon and Schuster, 1995.

United States. House of Representatives. Bill H.R. 2437 2d session. "Cable Competition Act." Introduced by Rick Boucher 22 May 1989.

Utne Reader. Special Section: "Cyberhood vs. Neighborhood." March-April 1995: 50-75.

Wiencko, Joseph A. "The Blacksburg Electronic Village." Internet Research Vol. 3 No.2 1993: 31-40.

---. "The Blacksburg Community Network." Presentation to Bell Atlantic. 17 April 1991.

Yarbrough, Beau. "The future is now: Electronic Village to open to the public." The News. 28 November 1993.

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