Communities in Action

Communities in Action:
Papers in Community Informatics

Edited by

Larry Stillman, Graeme Johanson
and Rebecca French

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PREFACE

BY LARRY STILLMAN, GRAEME JOHANSON, REBECCA FRENCH
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The chapters in this volume began life as papers at the Conference on 'Community Informatics – prospects for communities and action' in 2007, the fourth successful community informatics conference held at the Monash University Centre, Prato Italy. Papers were submitted afresh as chapters from academics and practitioners, and the best have been refereed and selected here for publication.

The Conference was auspiced by the Centre for Community Networking Research, Monash University, with the support of Turabo University, Puerto Rico, the School of Information and Library Sciences, University of Illinois-Champaign, the Royal Institute of Technology, Sweden, and the Swedish International Development Agency IT Support Program. This support from Sweden assisted with the attendance of delegates from Peru and Mozambique, and many generous conference delegates contributed towards the attendance of a number of others. People from over 22 countries attended – ranging from Finland to New Zealand, with a number from the Latin South.

It was thus appropriate that the first International Conference of the International Development Informatics Association was held within the conference, and several chapters deal with developing regions. They constitute a rich multicultural exploration of community action – from Puerto Rico, Johannesburg, Turkey, Japan, remote parts of Canada, New Zealand, Cape Town, Mindanao, and Beijing. There is a fascinating and illuminating exchange of ideas from developing and developed countries. The reader will also note that the implementation of Information and Communications Technologies (ICTs) in developing economies has constraints not applicable in developed regions. Constraints cover a wide range, from technologies and infrastructures (energy grids, networks) to human aspects such as poverty and low or no literacy.

This book creates a platform for exchanging experiences, case studies, and possible solutions to address the difficulties in deploying ICT in many

contexts. ICTs have become a very powerful community resource. The types researched in this volume include portals, messaging, various information systems, community networks, videoconferencing, telecentres, mobile devices, wikis, community radio, and others. In this book, the most common form is the community network, with cases emerging from formal and informal education, health, community development, local government, earthquake management, business, technology support, knowledge management, and public administration. It is notable that ICTs facilitate both the supply and demand side of e-government, with a specific community action slant – the provision of government services and information, and vital feedback to authorities on the adequacy and relevance of government.

In fact all ICTs are widely viewed by authors as two-way mechanisms, facilitating the perpetuation of and reflecting esteemed community values. The contents of this volume make it crystal clear that ICTs have a huge capacity for incorporation into different forms of community action, including social change, community learning, community connection, community knowledge, and community well-being and community development. Through learning about multiple forms of ICTs and action and how action is understood, we improve our grasp of the complexities of social-technical relations.

In the book derived from last year’s proceedings there was a mistake in a citation, for which last year’s editors apologise. In the 2006 book (ISBN 1847182771) at p. 87 there is a chapter by 'Graeme Johanson, Natalie Pang, Tom Denison, Don Schauder and Kirsty Williamson' titled 'Public Libraries as Communal Knowledge Commons'. The author order was incorrect. The correct author order is: Natalie Pang, Graeme Johanson, Tom Denison, Don Schauder and Kirsty Williamson.

Please note that spelling and punctuation conforms to both Australian/British and American styles depending on author choice.

COMMUNITY ICT PROJECTS: DO THEY REALLY WORK? REFLECTIONS FROM THE WEST END CONNECT PROJECT ONE YEAR ON

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The West End suburb of Brisbane is an example of a socially, culturally and economically diverse community in Australia. The suburb has traditionally been home to Indigenous and migrant populations as well as being a refuge for many of Brisbane's homeless people. The demographics of this suburb, however, are being significantly altered by new property developments with wealthier residents choosing to move close to the city. West End is rapidly becoming a digitally divided community. In 2004/05, academics from the Queensland University of Technology, worked with staff from the State Library of Queensland and the Ethnics Community Council of Queensland, and members of two West End community groups, the Women's Ethnic Network and the African Women's Network, on a community Information and Communication Technology (ICT) project. Twelve members from the two community groups participated in a series of personalized ICT training sessions. This paper presents the results of a focus group with the participants one year after their initial training experience to determine what ongoing impact, if any, the training had on their life and their community. Drawing upon the researcher's experience of conducting the project and having consulted the existing literature in the field of ICT projects, the following recommendations (or are they predictions?) for future community ICT projects are offered. Community ICT projects should (i) identify and utilize 'communities of practice'; (ii) be inspired to be community ICT initiatives; and, (iii) use community leaders or educators.

Introduction

This paper discusses the West End Connect Community Information and Communication Technology (ICT) project. The aim of the project

was to help bridge the growing digital divide within the West End community by designing and delivering ICT training courses to meet the specific needs of two West End community groups: the Women's Ethnic Network and the African Women's Network. The project was a collaboration between the Queensland University of Technology, the State Library of Queensland and the Ethnic Communities Council of Queensland (EECQ). The expected outcomes and benefits of project for the West End community were: (i) increased ICT skills and knowledge for the residents of the West End community; (ii) increased understanding by the residents of the West End community of the potential of ICT in their lives both personally and professionally; (iii) increased community capacity building within West End; and (iv) increased understanding and interaction between the West End community, Queensland University of Technology and the State Library of Queensland. The West End Connect project, like many ICT projects, has a definite start and end date. On completion of the project all participants reported that the training had a positive impact on their lives and their community. But did the West End Connect project really work? Did it have lasting impact? This paper presents the results of a focus group with the participants one year after their initial training experience to determine what ongoing impact, if any, the training had on their life and their community. Based on the participant and researcher's experience of the West End Connect project several recommendations are offered to guide other projects seeking to foster inclusive communities via community ICT projects. The paper is divided into three parts. Part one provides a brief discussion on community ICT projects with a focus on the issue of evaluation of long term effects and benefits. Part two outlines the West End Connect community ICT project. The implementation of the project is detailed and the key results from the initial project evaluation are presented. Part three discusses the follow-up evaluation of the project one year after the project ended.

The Effectiveness of Community ICT Initiative and Projects: A Brief Review

The number of community ICT projects has increased considerably as communities are around the world attempt to find ways to not just bridge a growing digital divide but to find avenues to foster social inclusion through ICT. In 2006 Gaved and Anderson examined the evidence for both long and short term effects of community ICT projects or initiatives. They undertook the examination with the view to guide policy

recommendations for the implementation and maintenance of future projects/initiatives. One of the key observations they made in their examination was that "detailed empirical research in to the effects of [community ICT] initiatives is scarce, especially over the long term" (p. 4). They suggest that this "may be in part because it was assumed that their effects would be positive, which may have led to a relative lack of assessment" (p. 4). They also note that because many of these community ICT activities are relatively young, occurring only in the last decade, and most evaluating and reporting has focused on the effects while the projects and initiatives are in operations. The fact that many of the ICT initiatives are "project based" (i.e. they have a set time period and fixed funding) means that long term effects or benefits are very rarely captured because there is very little research that explores what happens after initiatives finish. Gaved and Anderson (2006) point to the fact that whilst initial evaluation after the ICT initiative might suggest there is benefit to the community in the form of knowledge formation, skill development and improved quality of life or social capital, the reality is that the ending of the ICT initiative may in itself cause difficulties through the withdrawal of ICT access or support; and that this may lead to the reversal of any initial benefits observed. Gaved and Anderson (2006) conclude their evaluation of the current literature with several recommendations. Most notably is the need "to instigate a systematic programme of follow-up research on existing or recent initiatives to assess their social impact" (p. 29) and for all new "funded initiatives to insist as a condition of funding on the implementation of longer term (>4-5 years) multi-method studies of their social impact" (p. 29).

The West End Connect Project: An Overview

West End: A Brief Profile

West End is a rapidly changing, economically and culturally diverse inner city suburb of Brisbane. In the 2001 census West End had a population of 5832 with 2.4% of people identified as being of indigenous origin and 31.3% of people who were born overseas. The main three countries of birth were Greece, the United Kingdom and Vietnam. There were 3001 males and 2831 females. The median age was 33 years. The 2001 Census also indicated that 56% of the population had no educational qualification or stated no educational qualification. In terms of the labour market, 12% of the residents were unemployed with 35% of the employed residents holding part time positions only. The median weekly income for

the area was $300-$399. In 2001 less than half of the suburb's residents had a PC in their home and less than 12% of homes had an Internet connection (ABS, 2001). Currently, increasing property values and extensive unit development reflect the growing popularity of the area amongst professional and business people wishing to take advantage of the suburb's proximity to the West End CBD. West End enjoys a vibrant café society street profile with an influx of visitors on weekends. Gentrification of an area now considered valuable real estate is likely to impact the community in a number of ways. Increasingly, the population is separating into groups who have access to and are comfortable using ICT – the 'haves' – and groups who do not have access to and are not comfortable using ICT – the 'have-nots'.

The West End Community: A Working Definition

One of the first challenges to be faced in the project was establishing a working understanding of what is the "West End Community". The project team made two decisions (i) to have a flexible and adaptive understanding of the "West End Community" and of "West End Community Groups" (i.e. group members may either work or live in the area and/or the group holds meeting and events in the area); and (ii) to consult with the ECCQ (which is based in West End) to aid in identifying community groups appropriate for the current project. Through the ECCQ the following two community groups were invited to be involved in the project:

- The Women's Ethnic Network is a community group working with and for immigrant and refugee women. The group is based at the ECCQ and holds regular meetings and events in the community with group members working and/or living in West End
- The African's Women's Network is a community group aimed at supporting immigrants and refugee woman from Africa. Whilst the group is not based in West End per se (many of its members live and work outside of the area), the group holds it meetings at the ECCQ and as such has ties to the community.

These two groups were chosen for the project on the basis of that their represented the "socially, culturally and economically diverse" West End community. The fact that both groups were women support groups was an unexpected, but rewarding part of the project.

The Project

The project was undertaken within the Participative Action Research framework which has been successfully used in a wide range of fields including education, health, community development and agricultural extension (McTaggart, 1991). This framework best encouraged the inclusion of a diversity of perspectives, regular critical reflection and active involvement by participants and stakeholders in the design and conduct of projects. The ten month project began in November 2004 and consisted of four stages. Stage 1 involved exploratory research with the two community groups to identify their unique ICT training needs. A focus group was held with each community group. Most of the participants had mixed feeling about the ICT they had used – realizing it was of benefit to them but that is also created a lot of frustration and problems that took up time and forced them to rely on husbands, children and grandchildren to help them with the problems they encountered. All participants expressed the desire to develop the skills and confidence to sort out their own problems. Many of the women had found previous formal training courses difficult due to barriers created by terminology, language and the pace of the instruction. Most of the women were active within the community and almost all wished to be able to create flyers, newsletters and brochures to more effectively communicate information to others.

The findings from these focus groups informed the second stage of the project – the design of ICT training courses. Three training programmes were designed to cater for the specific needs of the two community groups: (i) Beginning Email; (ii) Effective Communication Flyers; and, (iii) Beginning Internet. Gerogogy, or "the strategies employing in teaching older adults" (Formosa, 2002, p. 73) formed the theoretical basis for the design of the sessions held with the Ethnic Women's Network. Participant's in the initial focus group with the community group ages ranged from 48 to 77 with a mean age of 65.84. As the focus group participants were also going to be the ICT training participants, geragogy was an appropriate guiding framework. The design and delivery of the training sessions were developed to incorporate key features of gerogogy: socially-involved group discussions and slower-paced peer learning (Formosa, 2002). The session with the African Women's Network was guided less by geragogy and more by adult learning theory or andragogy (Knowles, 1978). Focus participant ages ranged from 25 to 53 with a mean age of 44.25. Once again, as the focus group participants were also going to be the ICT training participants, andragogy was an appropriate guiding framework. The design and delivery of the training sessions therefore took into consideration Knowles's description of the typical adult learner

as someone who prefers to learn through purposeful activities which have meaning to their everyday lives.

Stage three of the project involved the administration of the ICT training courses. Three training sessions were held for the Ethnics Women's Group – one each of the three sessions. One session – the Beginning Internet – was held for the African Women's Network. This was the only session held for the group because of difficulties in arranging times for the group to get together. The training was held in two locations (i) a training room at the State Library of Queensland; and, (ii) a training room at the West End State School. Photo 1 presents a photo of one of the ICT training sessions taking place.

Figure 1. A West End Connect Training Class

Evaluation was the final stage of the project. Three evaluation strategies were used to assess the impact of the ICT training on the participants and their communities: post training survey; one-on-one semi structured interviews with participants three months after the training; and ICT trainer reflections. A full discussion of the results can be found in McAllister, Hall, Partridge & Hallam (2005). In summary, the evaluation revealed that social change could be effected for a target group by providing opportunities to develop basic computing skills training at a level that encourages continued engagement as well as skill and

confidence building for the community members involved. All participants expressed a wish to use their skills to promote the activities of their community groups thus facilitating further social change. Not long after attending the Effective Communication Flyer training session one of the group members designed and developed their own flyer to advertise a community event taking pace at the ECCQ (see Figure 2). Participants expressed a desire to develop further ICT skills which indicates a growing interest in continuing lifelong learning with ICTs. All has shared the experience with others in their communities and they had names of others wanting similar learning experiences. The project has promoted social change by providing an opportunity for a specialized learning environment that allows the group members to learn and grow at their own pace and style.

Figure 2: A real life outcome from the West End Connect project

The West End Connect Project: One Year Later

Eighteen months after the West End Connect ICT training project was completed, a focus group was held with the project participants. The focus group sought to identify what, if any, impact involvement in the ICT

training had on the participants and their communities. A focus group was used for data collection as they allow for the gathering of qualitative data through "carefully planned discussion designed to obtain perceptions on a defined area of interest in a permissive, non-threatening environment" (Krueger, 1994 p. 6). All twelve participants involved in the original West End Connect project were invited to attend the focus group. Invitations were issued via the ECCQ. Six of the 12 participants indicated that they would attend. However because of illness and other reasons only one participant attended the focus group. Interestingly two other community members—who had not been involved in the original project—quiet unexpectedly decided to attend the focus group session. The two "unexpected" community members had "heard about the focus group" and had decided to attend "because of the good things said about the training". It soon became apparent that by attending the focus group the two community members were hoping to be offered the opportunity to take part in a similar training programme that the original participants had experienced. Both participants had some basic experience with using a computer and the internet but were interested to learn how to use both more effectively for their committee and community work. Both had attended ICT training classes at the local library or Centrelink provider and had found the experience less than satisfactory. The session did not meet their specific learning needs because it was too fast, didn't provide enough time to practice or was aimed at a completely different audience (i.e. younger job seekers).

The one participant who had been involved in the original ICT training sessions indicated that she was now actively engaging with technology. She used the computer on a daily basis and has recently purchased a digital camera, but was struggling to learn how to download the images to her computer. She still had to rely on grandchildren to assist with this. She used the internet to book airline tickets and expressed interest in trying internet banking but was not ready at this point to do this as she didn't trust the internet for this type of activity. She had also attended another internet training session at the library but found it "too much too fast" and with "little time to go over the same things". She also indicated that she felt confident now to ask for help – something she said she would not have done previously: "I used to be too stupid to ask". She also spoke proudly of her ability to be able to pass on or share her new skills to friends: "I can show someone how to turn on the PC and open up the email". She has spoken widely about her experience of the ICT training sessions to others in the community and indicated that she had the names of another 6 to 10

friends who have asked her to let the project team know they too would like the same opportunity: “I am so lucky I said yes”.

Whilst only three people took part in the focus group, and of these three only one was actually involved in the ICT project, a few interesting observations can be made. These observations are based upon the initial discussions with the project participants and the follow-up focus group as well as the ongoing researcher observation and contact with the ECCQ (the organization who has regular contact with the two community groups). Firstly, ICT and ICT training does empower and change people’s lives. Secondly, ICT training for community groups should be provided via specialized learning environments that will allow the group members to learn and grow at their own pace and style. Thirdly, ICT training that directly involves only a small number of community members can still have considerable impact on the larger community group through shared narratives and support by the training participants with the other community members.

Limitations

The research has several possible limitations that must be considered. First, the research relies upon the use of self-reported data provided by participants. Self reported measures provide a useful opportunity to collect data otherwise not readily available. But self reported data is limited by what “individuals know about their attitudes and are willing to relate” (Nunnally, 1967, p. 590). Additionally, much of the information is recollections of past events and is therefore subject to the problems inherent to memory (even if the past was only the last twelve months). As such a significant potential limitation in the current study is the overall rigour of the data collection measure employed. Second, the research is subject to the influences of the researcher’s characteristics and backgrounds and rely heavily on the researcher’s interpretation of events and focus groups materials (Williamson, 2002). This may limit the validity of the research findings. Third, the sample size is quite small. With only one participant from the original project participating in the follow-up study the extent to which the results can be generalized to the entire projects participants’ is limited. As such any conclusions drawn are only suggestive at best. Fourth, caution must be taken when interpreting the findings in relation to the broader Brisbane community. This is because the participants were recruited from a small catchment within this community (i.e. only two community groups). Thus, what is presented here is a picture of the ICT and its impact on the West End community as

understood by only two specific groups within the broader community and more specifically by only a very small per cent age of members from these community groups. The existing picture can be deepened through replication.

Recommendations

Warschauer (2004) notes that "good big things come from good small things" and this was certainly the case with the West End Connect project. As already noted the current study is limited by its small sample size (i.e. only one participant took part in the follow-up focus group). Having 'experienced' the project from beginning to end (and beyond), and having consulted the existing literature in the field of ICT projects, the following recommendations (or is that predictions?) for future 'good small things" are offered.

Firstly, community ICT project should identify and utilize "communities of practice". Communities of practice are "networks of people who engage in similar activities and learn from each other in the process" (Warschauer, 2004, p. 120). Communities of practice are often found in informal networks such as families, occupational groups or in social contexts such as sports teams (Warschauer, 2004). Warschauer (2004) notes that learning in communities takes place through a "process of apprenticeship" (p. 121). This learning can occur formally through direction instruction or informally when "learners and experts observe, imitate, experiment, model, appropriate and provide and receive feedback" (p. 121). Thus, "an ideal learning situation provides the kind of scaffolding needed for apprenticeship learning to take place in a safe, supported way" (p. 121). Warschauer (2004) argues that communities of practice are important for community ICT projects because the "most valuable learning in society involves not so much *learning about* as *learning how*" (p. 122) and that learning how is intimately tied up with learning to be (i.e. developing the disposition, demeanor, outlook and identify of the practitioners). The West End Connect project clearly revealed that a "community of practice" was essential to success and that "apprentices" were a vital tool for passing on the "learnings" to the broader "community".

Secondly, community ICT projects should aspire to be community ICT *initiatives.* Mehan (1997, cited in Lenhart & Horrigan, 2003, p. 25) notes that "language has power" it makes a difference to the way "we talk about events and people…[and] in the way we think and act about them". He concludes that "words have constitutive power; they make meaning. And

when we make meaning, the world is changes as a consequence". Gaven and Anderson (2006) note that ICT developments are frequently labeled as "projects or initiatives" (p. 6). They support the view of Day and Cupidi (2004) that ICT developments should aspire to be "initiatives" rather than "projects". This is because an "initiative" emphasizes the need for ICT within community to be developed as "an integral part of community infrastructure" and that the "short term nature of the project mentality" is considered detrimental to the aim of social sustainability" (Day and Cupidi, 2004). It is true that the West End Connect project had a closed timeline and limited resource funding which are the frequent hallmarks of a "project" however by opting instead to refer the project as an "initiative" may have helped shaped the mind set of all stakeholders that there could be (should be) longer term implications for what was trying to be achieved.

Thirdly, community ICT projects should use community leaders or educators. Warschauer (2004) observes that ICT projects and initiatives often have powerful leveraging potential that can be used to support broader strategies of social inclusion. The roles of leadership, vision and local "champions" are crucial to the success of ICT projects for social inclusion. He notes that a common mistake made in ICT development projects is to make primary use of computer experts rather than the best community leaders, educators, managers and organizers. The West End Connect project did not involve any ICT "experts" per se. It was a collaboration between three institutions prominent in the broader West End community. The sessions themselves were run by qualified librarians (also qualified teachers).

Conclusion

In 2001 Luciano Floridi, in his invited address to the UNESCO World Commission on the Ethics of Scientific Knowledge and Technology (COMEST) observed that "information and communication technologies have put humanity in charge of the world. We are the masters of the universe…The problem is that our ethical development has been much slower than our technological development (p. 4). Floridi (2001) argues that "how information and communication technologies can contribute to the sustainable development of an equitable society is one of the most crucial global issues of our time" (p. 2). Floridi (2002) contends that our challenge is to build an information society for all, and this is a "historical opportunity we cannot afford to miss" (para. 14). The West End Connect community ICT project outlines in this paper will help the West End and

the Brisbane community to take steps to re-align ethical and technological developments within its boundaries. More community ICT projects are needed if Brisbane is truly to be come a 'smart and inclusive city' (BCC, 2001). If we are to meet Floridi's (2004) challenge of developing an 'information society for all' than we must become more actively engaged in social change that will bridge the digital inequality within community.

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COMMUNITY INFORMATICS AND KNOWLEDGE SOCIETY IN PUERTO RICO: PROMOTING CIVIL SOCIETY'S VOICE

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This paper presents the situation of Puerto Rico, where the present government, has indicated its intention to "move" the country towards a knowledge economy. Most of the efforts to achieve this have been directed to attract multinational corporations that participate in the production of goods allegedly associated to the information and knowledge sector, particularly biotechnology. While this occurs, a segment of the civil society is actively organizing its opposition to government policies as well as pushing for true changes in the government operation and structure, particularly the legislative branch. People working in community informatics projects are beginning to raise their voices and become organized to make others take notice of the importance of digital democracy to advance a conceptualization of an information and knowledge society that represents more democratic access to information as well as to the possibility of transforming that information to knowledge. The recently founded *Red de Infocentros* is one of the efforts being conducted to develop a social network that can influence public policy in order for the civil society not to be left out of this discussion that have had as its centers academia, industry and government. It is the contention of the author that a strong development of community projects, informed by a socio-technical approach to the infusion of technology in communities can raise awareness and allow for a broad discussion and participation of sectors that might be otherwise left out of this important decision making process either by design or omission.

Introduction

Puerto Rico, like many other Latin American societies, is in a process of transition. The question many Puerto Ricans ask themselves is: where is this transition headed? In this article I discuss my country's current situation in light of the existing governmental agendas and tensions

resulting from the decline of the economic model implemented in the country since the 1940s. We will explain the ways in which the government plans to promote the country's economic development and how these include a particular configuration of the knowledge and information society for Puerto Ricans. We will discuss the character of the demands set forth by certain sectors of civil society in political, economic and cultural terms. Within this context, we suggest that initiatives geared to a socio-technical approach and aligned with the practice of community informatics, such as the Infocenter Web (*Red de Infocentros*), could become an essential contribution to promote a solid voice in the definition of the knowledge society to be built Puerto Rico.

From Hands to Work to Minds to Work: Towards a Knowledge Economy

In the mid 1990s, the Puerto Rican government announced an ambitious technology project, PRStar, whose main objective was to build an Internet network to serve government agencies. It also emphasized the acquisition of computers for use by government personnel. In 1995, according to data provided by the Office of Management and Budget[1] (*Oficina de Gerencia y Presupuesto* or OGP in Spanish), there was one computer for every 37 government employees. By 1999, the ratio was one computer for every three public employees.

The Puerto Rican government obviously understood the importance of information and communication technologies and the privileged position these have in the current information and knowledge age. In accordance with this, it has invested considerable financial resources to developing a robust telecommunications infrastructure that is recognized as the cornerstone for transforming the country into one based on a knowledge economy.

At this historic moment in time, Puerto Rico needs to develop new routes of social, political and cultural development that are consistent with the development of a knowledge society, an aspiration shared by a large part of humanity. However, the route that seems to be favoured by government is not coherent with national reality or the social majority's interests. Puerto Rican government agencies in charge of designing and deploying economic strategy have called these "new" development initiatives "Minds to Work" (*Mentes a la Obra*), paraphrasing the successful economic development program deployed in Puerto Rico

[1] Documento de Presupuesto, 2000-2001. Oficina de Gerencia y Presupuesto

during the 1940s named "Hands to Work" (*Manos a la Obra* in Spanish, known in English as "Operation Bootstrap"). At that time, the country was transforming from a fundamentally agrarian economy into an industrial society. In the current case, the objective "to lead Puerto Rico into the knowledge economy" invokes the idea in government leaders that minds and not hands will transform the country and make it competitive on a global scale. Public discussions about the success of the models in Ireland and Singapore, among others, are so common that it seems there is a consensus that copying them is the way to go. Certainly, the country's economic situation is critical. The increase in taxes, the rise in the traditional cost of living and the decline of the manufacturing economy model (based on incentives which were never under Puerto Rican control) paint a dire and hopeless picture for many. This, together with uncertainty and instability created by the leadership crisis in the main political parties, generates unrest and has prompted many compatriots to emigrate in search of a better life.

> "It is no secret that for the past thirty years the Puerto Rican economy has not had even remotely satisfactory growth. It has averaged an annual rate of 2.2%/2.4% which translates into a little over 1.0% per capita growth. This number is far below that of countries with which we compete, such as Ireland and Singapore, and others like Chile. If we analyze the historic trend it is evident that we have lost the capacity to compete and that it imperative to set in motion measures which will facilitate our economy's capacity to compete." (Villamil, 2006. p.1)

Faced with this picture of economic displacement, the government is relying on the development of a knowledge economy as an economic development strategy. In January of 2006, a bill was introduced to both the Chamber of the Representatives and the Senate that sought to establish the promotion of "Puerto Rico's growth towards a knowledge economy" as public policy. This bill defines knowledge economy as "an integrated set of enterprises that require and employ researchers, engineers and technicians with specialized knowledge in science, its research processes and the associated advanced technology. Currently, this [economy] necessarily includes key sectors for the scientific advancement and economic development of Puerto Rico, specifically (1) telecommunication and informatics, (2) biotechnology, (3) the pharmaceutical industry, (4) medical devices, (5) health services technologies and (6) other advanced technology services including engineering services." The governments in office since the 90s have created a legal framework geared towards developing information management policies, the promotion of the

knowledge economy and the inclusion of ICTs in all government activity, all of which seem to favor the development of such an economy.

The Digital State Law (*Ley del Estado Digital*, Law 110, 2000) was created June 27 of 2000 as the first legislative measure pertaining to the use of Information and Communication Technologies in the government[2]. In 2004, Law 151, known as the Electronic Government Law (*Ley de Gobierno Electrónico*[3]), was approved. This law defined electronic government as "the incorporation of information technologies into government tasks in order to transform and expedite the Government's relations with citizens and businesses, as well as government relations, so that Government will be more accessible, effective and transparent to citizens." These laws were followed by others approved at the beginning of this decade. Law 188 from 2003 appoints the Puerto Rico General Library (*Biblioteca General de Puerto Rico* or BN) as a national library and specifies in its exposition of motives that the country had not had "public policy related to the development of our libraries or adequate management of information processes, which nowadays are recognized as so important for economic and social development". That same year, Law 209 was approved, creating the Puerto Rico Institute of Statistics (*Instituto de Estadísticas de Puerto Rico*, or IE) affirming the decisive advantage of having reliable data and information available and accessible for individuals and government agencies. The IE is charged with standardizing existing data from the various databases and information repositories and establishing mechanisms and procedures through which necessary reports could be provided for effective and efficient decision-making. The BN, the IE and the Trust for Science and Technology (*Fideicomiso de Ciencias y Tecnologías*), created by Law 214 of 2004, are essential parts of our society's development towards a knowledge based society.

Meanwhile, in 2005, approval of Law 69 charges "all agencies, public corporations and any other instrument of the Government of Puerto Rico to publish and update through their respective Internet pages and other means of institutional communication the official statistics and indexes that each entity manages." That same year, Law 101 amended the Planning Board Foundation Law to "specifically add the provision of all telecommunication and cable television services for the administration of broadband". The text of the law states that "[it] is the public policy of our administration to achieve two goals for economic development and the

[2] http://www.lexjuris.com/LEXLEX/Leyes2000/lex2000110.htm. Retrieved July 11, 2007

[3] http://www2.ogp.gobierno.pr/PDF/Ley151.pdf. Retrieved July 11, 2007

improvement of our citizen's quality of life: 1) the promotion of education and citizen interest in the use of technology and Internet and 2) to provide each Puerto Rican access to telecommunications services." The most recent study on the reach of telecommunications and Internet on the island (conducted this year) indicates that 35.3% of the population over 12 years of age has access to the Internet, which is significant. The report further indicates that the main uses of the web are e-mail, searching, newspaper reading, homework and chatting (ISOC-PR, 2007).

Without a doubt, government actions suggest a strategy for developing a knowledge economy. However it is our position that a knowledge economy and society are much more than this. This strategy omits cultural and educational considerations that are highly significant in this new society. Also absent is the perspective of incorporating ICTs to promote a collective development that emphasizes, supports, and facilitates the participation of various social sectors in strategic decision-making. It is precisely within this framework that community informatics arises as a valuable resource for proposing alternatives to facilitate this participation so that the social and economic transformation serves the interests of the majority of Puerto Rican societal sectors and to get these sectors to form part of the strategic group that will define a new society.

Knowledge Society and Community Informatics: Civil Society's Voice

Creating a knowledge society in any context posits significant social change. As we have mentioned, Puerto Rican political discourse insists on an information and knowledge society within the economic context and conveys the notion that there already are a number of more or less strategic undertakings that will lead us to a knowledge economy. It is paramount to clarify that the construction of a knowledge society is far broader than the mere implementation of economic development strategies, however far reaching or innovative these may be. A knowledge society incorporates a knowledge economy but is not limited to it, since it includes elements of social and cultural change that reach further than the economic aspect. Considering how technological development has influenced our lives, it is easy to envision that in a knowledge society citizens will change their ways of working, amusing themselves and even the way they face relationship problems. In other words, this transformation goes hand in hand with a change in lifestyles and thought patterns. This in no way implies that it is unnecessary to seek out economic development models consistent with and that help bring about

this new society. However, It is important to develop economic development mindsets in tune with a knowledge society incorporating the ideas and aspirations of those sectors traditionally excluded from access to knowledge, information and the technological advances in all stages that influence public policy.

One of the tools for this comprehensive approach is precisely community informatics (CI). The socio-technical perspective inherent to community informatics facilitates the active participation of popular sectors. Socio-technical strategies allow us to advance projects and initiatives to empower individuals and communities in the process of appropriating information technologies for the purpose of their own development and benefit. We see CI as a structured approach to supporting community development and self-management through the adoption of ICTs. By transcending the notion of "access to equipment" as its purpose, CI practice aids communities to organize, motivate, and empower themselves. Because we recognize the distinct importance of adapting ICTs to community circumstances and not the other way around, several sectors in Puerto Rico have generated projects that converge in the Infocenter Network (*Red de Infocentros*) founded last year. This alliance advances the initiatives, organizations and social spaces from communities themselves, so that these may in turn make use of communications networks and infrastructure. This pays heed to the idea that "ICTs are not a magic formula that turns copper into gold or zeroes and ones into democracy, participation and development. . ." (Gómez, Martínez & Reilly, 2001). The Infocenter Network brings together public and private higher education institutions, sector alliances, municipal governments and NGOs. Currently, as part of the process of creating the Infocenter Network, philosophical and practical directions are under discussion, a natural and necessary step for all alliances. The Infocenter Network's influence is evident in the establishment of a collective purpose and agenda, not imposed from the top down, but achieved through negotiations and the combined efforts of all participating entities. Anyone who has ever worked with community network creation knows that this is a slow process, zigzagging, but full of possibilities. The strength lies in the base organizations, since they are the ones who can generate enough energy to establish a shared agenda that can guide the Network towards citizen empowerment.

Traditionally, community-based organizations have adopted democracy, education, cultural diversity and the common good as core values. These values are inherent to CI, so that communities can take control of ICTs and engender a different way of relating to these technologies, not from a

standpoint of dependence, but using them as tools for development, empowerment and freedom. As Castells reminds us, technologies are not neutral: he argues that the cost for inclusion in technological systems is "to adapt to their logic, their language, their codes" (Castells, 1996). Technologies cannot determine or configure community life; they are instruments which, despite their lack of neutrality, may be applied for domination or for empowerment. Community informatics practitioners in Puerto Rico understand that it is possible and necessary to incorporate ICTs in community life and that this process increases communities' social capital.

The Economic Development and Government Transformation Plan for Puerto Rico (*Plan de Desarrollo Económico y Transformación de Gobierno para Puerto Rico*, Oficina del Gobernador, 2006) collects and evaluates a series of studies and analyses from different historical periods on the Puerto Rican situation and illuminates the points of convergence amongst these. In essence, the same conclusions are repeated: that Puerto Rico must engender a transition process towards a knowledge economy and that the key to this is defining the strategies to build such a society. Regrettably absent from these studies is a description of the kind of knowledge society we aspire to build. Current government discourse states that Puerto Rico needs to be "led" to a knowledge society. Puerto Rico cannot be led to a knowledge society because this society does not exist; we have to build our knowledge society. This is more than a semantic game of splitting hairs. Castells (1997) has already advocated about the desirability of referring to information societies, recognizing the idiosyncratic diversity and the different shapes these new societies can take.

Creating a new society entails a schism with old notions and practices associated to the current state of development. It is necessary to disassociate the country from ways and models of living together, working, studying, providing services and governmental and civil management which are decayed and worn. It is not a matter of wiping the slate clean; as in all change processes, existing societal elements are reformulated to act in conjunction with new processes and innovations to support the transformation into what could become our knowledge society. It is crucial to emphasize that changes are not events, but processes that take place and develop over a period of time. We are referring to a paradigm change in the sense defined by Kuhn (1962), a radical change that requires a break with the past and its way of viewing life and the world. In this transformation, civil society has played an outstanding role and is ready to influence the process even more.

Puerto Rican Civil Society

For the past 5 years, Puerto Rican civil society has been active on specific issues of public interest. Topics such as the transformation from a bicameral to a unicameral legislative system have galvanized diverse sectors from different ideologies and political groups who coincide on the desirability of such a reformation. It is an increasingly frequent occurrence to hear this reformist posture in communities and other centers of public exchange. The growth of this support has been spurred on by the legislature's decision not to act upon an electoral mandate that ordered it to hold a referendum on the structure of the new legislative assembly. The referendum, resulting in a majority victory for supporters of unicameralism, has been ignored by the current legislative assembly and paralyzed the legal process that was defined by the consult's results. Within this context, civil society is organizing and taking charge in diverse aspects and levels to occupy the space previously reserved for the political parties.

The convergence achieved by this issue should serve as an example, as it did in the case of Vieques, in which residents of the island-municipality led a struggle for over 40 years for the US Navy to cease its bombings. In both cases, community interests have increasingly used ICTs to promote, organize and disseminate information about their activities. By the same token, the struggle against the death penalty or the war in Iraq incorporate incipient ICT supported rallying strategies. The creation of the Infocenter Network denotes a higher level of community struggle that incorporates ICTs for these purposes. This is one of the ways CI can marshal some of the country's Infocenters to generate community capacity for promoting the voices that are not easily heard by the country's powerful strata. Building an information society in Puerto Rico entails a social and cultural transformation where changes are reflected in all aspects of citizen life.

An interesting new development has taken place recently in the form of an initiative called Citizen Forums (*Foros Ciudadanos*), sponsored by the most highly circulated newspaper in the country and an NGO, the Corporation for Educational and Community Program Support or CAPEDCOM (from its name in Spanish: *Corporación de Apoyo a Programas Educativos y Comunitarios, Inc*.) These forums are designed to advance the creation of solutions to the country's problems amongst communities and individuals. The structure provides a limited time (three minutes) to describe a problem and suggest a concrete solution that may or may not be in the hands of the government.

At the time of writing, no one has addressed the topic of technologies, but the space to do so in November 2007 has already been requested by and granted to the author. The Infocenter Network will prepare an analysis of the situation already described and suggest ways to articulate our position, as well as the rest of civil society's, as pertains to the design of a knowledge society in which activities like the Forums are commonplace and accessible through the country's telecommunications network. Government agency representatives are already responding publicly to citizen suggestions, and although there is a danger of citizen strategies being ignored, tactics are being developed to ensure that these proposals are not forgotten, including their dissemination through the telecenters.

The knowledge society in Puerto Rico will take forms yet to be defined, but that have the potential to make a more livable society for all of us. However, this element is sometimes taken for granted. A knowledge society will be neither more democratic nor authoritarian than the current society; it all depends on how we as Puerto Ricans shape it. The new knowledge society to be constructed has the potential, for example, to provide greater access to the signature tools of this new era, information and communication technologies, along with greater access to develop information management skills and competencies that will help decrease the current environment of social and economic inequality.

In the same manner, however, we are currently experiencing greater electronic surveillance of citizens, especially in those sectors where poverty, unemployment and desperation underlie a surge in delinquent activity as a survival method. A knowledge society has the potential to keep knowledge as valuable merchandise, an asset for some of the country's sectors, creating greater inequality, just as has been the case in other countries, exemplified by the so-named digital divide.[4] Our knowledge society must be conceived as truly progressive, guaranteeing the enjoyment of its benefits to the greatest part of Puerto Ricans. In this sense, a knowledge society in Puerto Rico will be defined by our values and our vision of a Puerto Rico with a future for all of us and will be built with the participation of civil society.

Puerto Rico needs to create a new Social Contract that achieves multi-sectorial consensus and that is managed in conjunction with the citizenry so that citizens can identify with it. Already there is a group of syndicates, especially state workers, who have generated interest in advancing active participation in defining the route the country's progress must follow.

[4] This concept refers to the difficulty of access to information and communication Technologies and the limitations created by ignorance of their use.