Community e-kiosk portal technology on Wall Street

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Abstract

The community of downtown Wall Street in New York City continues to cope with economic disruption, due to the World Trade Center disaster of September 11. This case study explores design factors of engagement in the implementation of a Web-based e-kiosk portal, which is furnishing residents of the community with critical cultural, financial and social information on the re-building of the downtown economy. The e-kiosk portal was an emergency project implemented by computer science and information systems students at a major metropolitan university. The preliminary findings and implications of the study indicate the importance of social and technical cachet in the design of a Web portal community. The study introduces a framework for research into civic Web communities that empower its member residents.
Keywords: community, e-government, government-to-citizen (G2C), Internet, kiosk, portal, touch-screen technology, World Wide Web.

1 Background

Community is considered to be a critical characteristic of the Internet Armstrong and Hagel III [1]. Community is concretized as a "feeling of membership in a group along with a strong sense of involvement and shared common interests … [that] creates strong, lasting relationships." Rayport and Jaworski [2]. Definitions of community consist of "a social grouping which exhibits … shared spatial relations, social conventions … and an on-going rhythm of social interaction Mynatt et al. [3]. Features of community are empowered by connection and communication functionality of the World Wide Web. This functionality helps consumers and citizens in continuing to engage in dialogue

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on the Web with business and governmental entities. The culture of community is enabled not only in an off-line but an additional on-line context.

Communities in an on-line context are characterized as those of fantasy, interest, relationship and transaction [1]. Communities of fantasy are illustrated in chat and discussion games on ESPNet. Communities of interest are indicated in financial Motley Fool Web-blogs and forums, and communities of relationship are indicated in interpersonal Cancer discussion Forums of help. Communities of transaction are indicated in Land's End forums of product inquiry friends and shoppers. Communities can have elements of each of the forums on the Web [1].

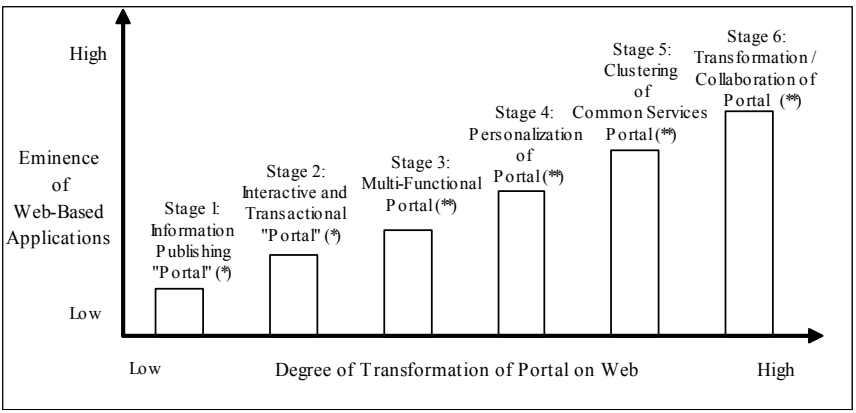
The design of an on-line community on the Web is considered a constant challenge Ginsburg and Weisband [4] for technologists. The first intent is to enable social capital, defined as a "network" Cohill and Kavanaugh [5], Nahapie and Sumantra [6] and Schuler [7] or "web of social relationships that influences individual behavior and … [impacts] economic growth" Lesser [8] and Pennar [9]. These networks of relationships furnish empowering information to citizen and consumer members of a "trusted" Putnam [10] community. Interaction in customized forums of citizens and governmental agencies is further indicated in an "empowered deliberative democracy" Fung and Wright [11], which may help disadvantaged members. Empowerment is enabled in the implementation of a community design that is considerate of diverse concerns of community members and residents. Community design is facilitated in the introduction of a government-to-citizen (G2C) portal that is currently transforming the home page of a traditional Web site.

2 Introduction

An on-line portal is defined as a dynamic or static site on the Web that collects content for a group of members that have common interests Heflin [12]. A portal can be considered horizontal and public, as in a G2C or business-to-consumer (B2C) portal, or vertical and private, as in a business-to-business (B2B) extranet, personalized business-to-customer (B2C), or business-to-employee (B2E) intranet portal Donegan [13]. Portal in this study is defined as horizontal and public to members and residents of a distinct community. Members can contribute and get information on the horizontal portal from other members and from other sources of interest for the members. The immediate benefit of the Web portal is the integration and interoperability of diverse information sources.

Designers of a community G2C portal are challenged by the heterogeneous nature of information sources, in order to have a common standard for information display and exchange and a highly functioning and intelligent site Gant and Gant [14]. Though a portal is the framework for the federal government to develop its electronic (e-Government) strategies through the Web Fletcher [15], internal issues in the agencies of the government are frequent in the development of e-Government portals Liu and Hwang [16]. State governments are not even distinguishable in the efficiency, functionality and innovation of

their information portals Watkins [17]. Figure 1 below indicates the slowness in the implementation of e-government portals in the United States, in phases of transformation: information publishing "portal", interactive and transactional "portal", multi-functional portal, personalization of portal, clustering of common services on portal, and full collaboration and transformation of portal Wong [18].



(*) Individual departments of government; (**) Multiple departments of government.
Source: Wong [18] (Adapted).

Figure 1: E-government portal transformation in United States.

Design of a community portal is concurrently impacted by the perception of the portal by members and residents in the community. Studies in the literature frequently indicate the importance of trust, usefulness and ease of use in e-Government services on the Web Warkentin [19]. Openness of services is often indicated to be important on the portal site Demchak et al. [20]. Perception of ease of use may be facilitated by increased innovation in electronic (e-kiosk) information and self-service touch-screen Web-based systems Boudioni [21]. Such systems may be failures though Dragoon [22], if friendly and simple graphical user interfaces and screen layouts and intuitive navigational tools Cranston et al. [23] are not evident for distinct Mendelsohn [24], limited literate Ekberg [25], and health impaired members. Residents may be disadvantaged in the community due to unanticipated catastrophe. Few studies in the literature have analyzed further factors specific in the design of an on-line community portal that may be helpful to potentially disadvantaged or challenged members and residents in solving immediate issues arising from a catastrophe.

3 Case study

This study analyzes a design of an emergency Web-based e-kiosk portal, for a community of citizens in the Wall Street district of New York City. The citizens consist largely of local disadvantaged residents and small businesspersons that

continue to cope with the dislocation of apartments and offices and the disruption of the downtown economy and life, due to the World Trade Center disaster of September 11 Rosenberg [26]. The function of the e-kiosk portal is to be a catalyst for economic development, in an initial facility for furnishing employment information and financial and governmental information on loan procedures, local rebuilding programs and social and cultural projects that are enabling the recovery of the economy. Its function further includes instillation of confidence in the recovery of the city and the World Financial District on Wall Street. Funded by grants from the Center for Downtown New York of Pace University, a member of the community, the e-kiosk portal is an extracurricular outreach implementation by graduate and undergraduate students of the Ivan G. Seidenberg School of Computer Science and Information of the university. These students responded enthusiastically to the post September 11 impact.

The e-kiosk consists of the following features: *Who Are We*, *What's New Downtown*, *What's New with the Rebuilding*; *Want to Learn More about Downtown*, *Want to Have Lunch and Shop*, *Want to Volunteer*, and *Want to Talk to Us*. These features are enabled in a pleasant and simple graphical Windows interface and intuitive and navigational touch-screen system, illustrated in Figure 2.

To enable community, the e-kiosk is not only an off-line physical facility of information, in installable downtown locations, but also an on-line virtual Web portal of interactivity that links small businesspersons and residents, and also tourists, to cultural, economic, employment, financial and governmental agencies. This portal is beginning to enable a bona fide citizen community that includes institutions and members beyond downtown and in New York State and in the Northeast Corridor of the United States. Students of the university, along with the citizens, are already members of the community.

4 Focus of analysis

The focus of the analysis is centered on factors contributing to citizen engagement in the e-kiosk community. Rayport and Jaworski define factors in a design method that introduces *cohesion*, *effectiveness*, *help*, *language*, *relationship* and *self-regulation* [2] in the functionality of a Web community. The factors are defined below:

- *cohesion*, element of design from which members have a feeling of belonging in the community;
- *effectiveness*, element from which members have a feeling of personal impact from the community;
- *help*, element from which members have personal help from the community;
- *language*, element from which members have a forum for specialized languages in the community;
- *relationship*, element from which members have interaction and friendship in the community; and
- *self-regulation*, element from which members regulate their interactions in the community [2].

These factors are imputed to facilitate fulfillment, inclusion, influence and emotional experience sharing [2] in a Web-based community. Though the students applied the factors in their implementation of the e-kiosk portal, in iterative prototyping and usability review, its extension as a model to other civic Web communities is not substantiated empirically by theorists. This study analyzes these design factors of engagement in the e-kiosk Web portal community, and its preliminary findings are demonstrating the importance of the factors in a functioning economic and social Web community in the Wall Street neighborhood.

Figure 2: E-kiosk portal on Wall Street (sample screen).

5 Methodology

The methodology of the case study is analyzing the e-kiosk community portal, in the downtown New York Wall Street neighborhood, in three stages.

In stage 1 a controlled off-line sample of students, of the School of Computer Science and Information Systems at Pace University, not members of the e-kiosk implementation team was surveyed by questionnaire by the authors. The questionnaire surveyed the students on perceptions of the importance of the *cohesion*, *effectiveness*, *help*, *language*, *relationship* and *self-regulation* factors in the e-kiosk Web community, on a simple *high*, *intermediate*, or *low* scale.

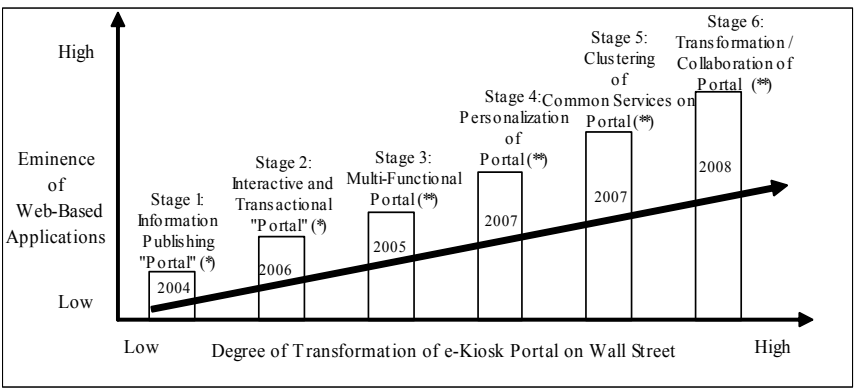
These students were mature subjects and were surveyed as though they were downtown residents and small businesspersons.

In stage 2 the survey is being currently expanded to include an on-line sample of non-student downtown residents, small businesspersons, and tourists. In stage 3 the findings of stages 2 and 1 will be analyzed through descriptive and statistical interpretation, with the final study to be finished in early 2007.

6 Preliminary analysis

From stage 1, and a limited stage 2, of the preliminary study, a summary of the analysis disclosed that most of the sampled subjects indicated *help*, *effectiveness* and *cohesion* factors as *high*, in importance ranking in e-kiosk engagement functionality. The subjects indicated *relationship* as *intermediate* in importance. They indicated *self-regulation* and *language* as *low*, in importance ranking in the functionality. They indicated What's New with the Rebuilding and What's New Downtown as *high* in feature importance on the portal. Want to Talk to Us was indicated as *intermediate* in importance, while Want to Volunteer, Who Are We and Want to Have Lunch and Shop were indicated as *low* in importance on the portal site.

The e-kiosk on Wall Street was indicated in the analysis to be at lower stages of e-Government information publishing and multi-functional "portals" in 2004–2005. It will be at higher stages of interactive and transactional, personalized, serviced and transformational portals in 2006–2008, if fully integrated with New York City and New York State portal systems. The stages of transformation are indicated in Figure 3.



(*) Individual departments of government; (**) Multiple departments of government.
Source: Anderson and Lawler, 2005 and Wong [18] (Adapted)

Figure 3: E-kiosk portal system on Wall Street (2004–2008).

The study needs further analysis and interpretation in stages 2 and 3 of the methodology, in order to evaluate the creditability of the initial methodology. Stage 2 will be finished in fall 2006, and stage 3 will be finished in winter 2007.

Though the findings of the study will not be final until 2007, the preliminary findings are helpful in analyzing a civic portal Web community.

(Further information on statistical findings in stage 1 will be furnished upon request of the authors.)

7 Implications

The preliminary findings from stage 1 of this study imply the design importance of the *cohesion*, *effectiveness* and *help* factors in the downtown New York community. The factors of *help*, *effectiveness* and *cohesion* are indicated to be high in importance in the e-kiosk portal, in expediting financial aid and employment for disadvantaged residents and small businesspersons in downtown New York and Wall Street. The e-kiosk is important in helping the Small Business Development Center of the university, in informing the small businesspersons and residents of over $10 million in governmental and economic injury loans and job services. This e-kiosk is further instrumental in informing residents, businesspersons and tourists of neighborhood recovery and social programs. Factors of *help* and *effectiveness*, furnished in the e-kiosk portal system, give the disadvantaged residents and the small businesspersons, if not the tourists, the feelings of increased confidence and pride in the recovery of downtown New York.

Factors of *relationship* and also *self-regulation* and *language* are indicated to be respectively *intermediate* and *low* in importance in the functionality of the e-kiosk Web portal community. Friendships of the residents and the small businesspersons, as members of the community in interaction on the network, are not currently forming social capital, as the e-kiosk is not community-driven Zhdanova and Fensel [27] and functioning as an information portal. However, the World Wide Web is helpful inherently in integrating members in a community Preece [28], fostering social capital. Further capital may be formed in integration of the downtown community with other constituencies in New York and on the Northeast Corridor of the United States. Though the benefit of an on-line virtual community *to the community* is its social capital, the residents and small businesspersons have a good foundation and process Fernback [29] in the existing e-kiosk portal system to enable a later social structure.

Findings indicated the design importance of interface on an e-kiosk community portal system. On-line kiosks are indicated in the literature to enable inclusion of senior citizens that might otherwise be excluded from an information society Ashford et al. [30]. Students, in a limited stage 2 of the study, learned that senior residents in the downtown Wall Street community were not excluded socially or technologically as members of the system. Touch-screens on off-line physical portals in the neighborhood facilitated interface to What's New with the Rebuilding and What's New Downtown, for senior residents frequently hesitant in keyboard and Web technology Coleman et al. [31] and Cranston et al. [32]. Usability of the touch-screens facilitated social inclusion [21].

Further findings indicated the importance of external e-Government projects in initiating kiosk community Web portals. Students in the School of Computer Science and Information Systems at Pace initiated the e-kiosk information publishing "portal" on Wall Street in less than three months in 2004, and the multi-functional "portal" in less than one month in 2005, as indicated in Figure 3. Internal state and city governments may often be slow in initiating service solutions through Web portal sites Douglas [33], as indicated in Figure 1. Governments may be limited by internal legacy systems. Full integration of the e-kiosk portal system on Wall Street with New York City and New York State systems is however a next step in the university.

Other findings of the preliminary study confirm the benefits of including self-motivated and mature students in a Web community portal project Alavi et al. [34]. The students that implemented the portal system indicated increased learning in the technological context of community Web design. They also learned design in the social context of the implemented e-kiosk portal Web community for downtown members and residents. The students were sensitive to socio-technical systems design Eason [35]. Residents and small businesspersons are as a result inquiring of further empowerment in a functionally enhanced informational e-kiosk portal system, to be implemented with requested student volunteers of the university. In short, the community of downtown New York on Wall Street and Pace University continue to benefit from a fruitful partnership.

8 Limitations and opportunities for research

The study needs empirical evaluation of the exploratory findings from the survey of students and of the forthcoming results from the survey of non-student residents in the Wall Street neighborhood, in order to extend generalizability. Further research will be initiated in future integration of audio podcasting, digital interactive television, and hand-held mobile tools with the e-kiosk portal system. Integration of the system with the New York City and New York State portal systems, and possibly with the portal system and its technologies in Washington, D.C., is intended in the near future and will be a new opportunity for research.

9 Conclusion

The study identified design factors of importance in engagement in an e-kiosk portal Web community. Further empirical research is needed in an expanded study, in order to analyze the factors of importance in the implementation of civic Web communities. This study of the downtown New York City Wall Street community is facilitating an evolving and new framework.

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