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Borough of Crafton
Student Consultant, Joseph Arasin
Community Partner, Douglas Sample

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EXECUTIVE SUMMARY

Student consultant Joe Arasin worked with Douglas Sample and the Borough of Crafton, located at 100 Stotz Avenue, Pittsburgh, PA 15205. The Borough Government works to maintain a stable population and preserve the level of municipal services to the community. Douglas Sample, borough manager, works to maintain smooth operation of borough services and plan future development.

We attempted to improve data analysis and management with the implementation of a database application to manage permits and citations. We decided to develop a solution in-house as an examination of existing commercial solutions revealed none that fit within the Borough's limited budget. After working through the implementation of a partial solution in Microsoft Access, we decided there was no way to adequately balance usability and sustainability on a project of this scale. For the future, I am recommending the development of a web-based in collaboration with other local municipalities in a similar situation. The web interface will enable additional services such as on line permit applications, and the collaborative effort will increase sustainability by enabling the concentration of limited resources. In addition, I recommend the development of a plan defining the role technology will play in the development of services and automation of workflow over the next several years. A cohesive technology plan will allow for results-driven initiatives and more accurate budgeting.

ABOUT THE ORGANIZATION

Location

The Borough of Crafton is a 1-square-mile Borough located just southwest of downtown Pittsburgh. It is located near several major highways, and is accessible from downtown Pittsburgh via Port Authority bus via the West Busway. The borough government and public services are housed in the Crafton Municipal Building, located at 100 Stotz Avenue, Pittsburgh, PA 15205.

Staff and Responsibilities

Borough management consists of the borough manager, building inspector, and two secretaries. The borough management is responsible for the administration of the borough, including finance, personnel, emergency services, parks and recreation.

One particular responsibility is efficient managing of all 2300 parcels of property within the borough. This includes enforcement of building code and zoning ordinance and the maintenance of public property and infrastructure. Currently, the building inspector/zoning officer conducts field inspections, recording data by hand. Information from these is brought back to the office and processed, with data being copied either to a citation or a permit. Secretaries file the records and alert the property owners. Approximately 500-1000 of these requests and citations are processed annually.

Because of the small number of people involved, internal communication generally occurs mostly face-to-face or via cell phone. Communication with the community takes place at biweekly borough council meetings, local television, a telephone hot line, and semiannual print newsletters. A website exists, containing digital copies of the newsletters as well as other borough documents, but nobody in the organization knows how to update it.

IT Infrastructure

The borough's IT infrastructure consists of several Windows desktops of various age and one Windows Small Business Server. The machines are networked and have a broadband Internet connection through Comcast. Data is backed up to the server, which is backed up to tape, although tapes are not taken offsite. Staff has Crafton e-mail addresses. No full-time IT staff are kept, rather, IT Management is outsourced to Compu-Fix. New

technology purchases occur as needed, but there is no effort to develop solutions with technology.

Budget
The Borough's annual budget is about $3.5 million, with approximately $1500 dedicated to purchase of computer hardware and software.

PROPERTY MANAGEMENT SYSTEM
Opportunity
Records are currently stored in a series of filing cabinets. These records include permit applications, code enforcement citations, and copies of issued permits. While this is fine for archival purposes, this method of storage provides for limited data analysis capabilities. About 500-1000 of these requests and citations are handled annually. A central database and distributed client application is to be implemented to allow any of the users in the office easy, access to the data.

Approach
- Examine the types of data to be stored, the methods by which it is gathered, and desired analysis capabilities to determine specifications for a system, whether purchased or developed in-house

- Locate and evaluate several commercial software packages by contacting other governments and searching the Internet. Although many packages that fit the specifications, none fell within Crafton's tight budget constraints

- Work through the various functions of Microsoft Access, including tables, queries, and forms.

- Populate the database with records acquired from the Allegheny County government, and designed tables to store permit-related data

- Develop a prototype user interface to the database using forms and reports

Anticipated Outcomes
- Community Partner will have a clear idea of what is needed in a solution, and be aware of the functionality of available commercial solutions

- Community Partner will understand basic principles of relational databases and the various functions of Microsoft Access

- The Community Partner will be able to instruct other users in the usage of the database

Anticipated Impact
- Expedite the permit application process by avoiding repetitive copying

- Centralize and simplify data gathering and reporting

- Improve the decision-making process by making possible and practical new ways of analyzing data tracking trends

OUTCOMES AND RECOMMENDATIONS
Property Management System
We were attempting to streamline data access and analysis with the creation of a database to manage permits and code enforcement. We intended to have a system that would improve productivity and analytical capabilities.

Outcomes

- **Defined the needs:** We worked through the permit application and citation-issuing processes, talking to the Building Inspector to get a better idea of the meaning of some ambiguous fields. We decided that, at the bare minimum, we were looking for a system that automated the permitting and code enforcement process. In addition, we desired network functionality with synchronization enabling building inspectors can access the data from their laptops while performing an inspection.

- **Evaluated Several Commercial Packages:** We looked at PTWin32 from Black Bear and CityView from Municipal Software. Both of these systems provided the necessary permitting and code-enforcement functionality. CityView offered some interesting capabilities for customization, but neither system had the desired synchronization capability. More importantly, though these and all other available programs to handle the task range in cost from approximately $1,500 to well over $20,000, well outside of the borough's IT budget.

- **Created a working proof of concept in Microsoft Access:** We created a Microsoft Access database to manage occupancy permits, one of the more simple documents. We were most concerned with the development of tables and the user-interface, the tables being prerequisite to any further development and a usable interface necessary for user adoption. The community partner is capable of constructing tables in design mode and forms via the wizard. The problem, though, is that for projects of this size, wizard-generated forms are, for the most part, unusable. When I went to figure out the time and skills required to develop a usable interface, one form took about 7 hours and required significant Visual Basic code to develop.

- **The chosen course of action was unsustainable:** After this experience, Doug and I felt the use of Micoroft Access for this application was not going to provide a solution manageable by the largely non-technical borough staff, which the main reason for choosing Access in the first place.

Impact

Through the design and development process of the property management system, the Community Partner understands basic concepts of database design and has performed several tasks with Microsoft Access. These skills are relevant to the borough's mission because they aid the important task of records management. The ability to develop small databases to manage information will allow for better organization, analysis, and reporting of borough data, and potentially improve the planning, or at least the records management capabilities of the borough.

The development of database applications promotes a new vision of technology within the Borough by formalizing the concept of electronic storage. This is a more maintainable, recoverable system than the filing cabinets currently in use. In addition, the development of these database applications creates a centralized resource where data can be accessed.

Recommendation: Develop a Web-Based Property Management System

While we have a proof of concept and the beginnings of an application developed in Microsoft Access, developing a truly useful application for the specified purpose is extensive and extremely time consuming. After consideration of the limited extensibility of Access applications, spending any serious amount of time on the Access project is frivolous. Instead, resources should be directed towards developing a web-based application.

The web application will offer many tangible benefits over the previously attempted Access database:

- **Improved Internal Interface:** Simultaneous usage by multiple users is to be expected, rather than an afterthought. Building inspectors could have the ability to record inspection results on PalmPilots or

SmartPhones, which then could be either saved and submitted upon connection. Remote Internet access from these devices will allow for the immediate accessibility of this data, as soon as the inspection is complete. In addition, recopying of data will be avoided.

- **Expand External Interface:** This application opens up many potential opportunities for the development of public applications. For instance, provide the capabilities for people to file permit requests online and check the processing status.

- **Connection with other products:** There is no reason for the borough to be maintaining the same data as the county. Duplication of effort leads to more errors and increases total data entry costs. Interfacing borough applications into the county database creates an more up-to-date, cheaper to maintain, system. Web applications offer the ability to provide an interface to the general public, allowing for better government transparency. In addition, creating an online interface will allow citizens to submit permit requests online, creating an entirely electronic workflow and eliminating redundant data entry.

Implementation

- **Cooperation:** Many other local governments probably find themselves in a similar situation as Crafton. The application developed would be useful to any local government, and cooperation will increase available resources, saving costs for all involved parties. The other municipalities may bring different ideas into the process, as well. In addition, the successful development and implementation of this system will require an external consultant, who could probably be obtained through the Carnegie Mellon Information Systems Department *<http://is.hss.cmu.edu/studentprojects-overview.html>*or the Web Application Development class taught by Jeffrey Eppinger *<http://www.cs.cmu.edu/~jle/>*.

- **Services:** The involved municipalities will need to determine the functionality they want to get from this system. Important issues to discuss are services the municipalities need to manage workflow, services the municipalities would like to provide to citizens, and who has access to what functions. The consultant should be included in the process, particularly with regards to assessment of technological feasibility. In addition, Public Sphere Information Group hosts a "Municipal eGovernment Best Practices" site *<http://www.psigroup.biz/megap/best_practices.php>* linking to many municipal governments across the country that have particularly interesting examples of online tools in various categories, including permit management and code enforcement. Also, the US Department of Housing and Urban Development has a document on the experiences of municipalities of different sizes on the implementation of electronic permitting systems. *<http://www.pathnet.org/si.asp?id=690>*.

- **Hosting:** Web applications reside on a server on the Internet. One important decision is whether to host the application internally or outsource the hosting. Hosting the application internally grants full control over the system, but also full responsibility for its maintenance, including backups and security patches. Given the lack of a full-time IT staff, I recommend outsourcing hosting to one of many companies that provide this service. Two particularly well-respected web hosting providers are TextDrive *<http://www.textdrive.com>* and Dreamhost *<http://www.dreamhost.com>*. The cost of the hosting will depend on the requirements exerted by the application, ranging anywhere from $10 to $100 per month. This cost could be offset if multiple municipalities work together in developing the project and sharing a host, lowering costs and increasing support.

- **Testing and Data Migration:** The consultant will develop the application, and the involved organizations will need to work with the consultant to implement testing procedures. The organizations will report feedback, and the consultant will make any necessary changes. When this process is completed, a migration plan will need to be developed. Some concerns are how much past data to enter into the system, user training, and future procedures.

- **Privacy:** If the Borough decides to implement public online services, privacy becomes a paramount concern. Borough Council will need to discuss the desired balance between privacy and functionality, and a privacy policy should be developed. Important issues to consider in the development of the privacy policy are the Borough's practices in gathering and sharing data, users' ability to correct mistakes, and users' access to data in general. The OECD released the Fair Information Practice Principles *<http://www.oecd.org/document/19/0,2340,en_2649_201185_1815059_1_1_1_1,00.html>* which provide excellent guidelines as to the requirements guideline as to the requirements

Recommendation: Technology Planning

While computers are central to daily work in the borough office, there is no long-term plan that defines the current and desired role of technology in the borough. Technology is given very little attention in the annual budget – funded if there is a pressing issue. The lack of a long-term vision as far as technology is concerned severely limits the borough's future capabilities. A well-defined long term vision allows for the better use of resources and the measurement of progress. To establish this technology plan, the borough will need to evaluate their long term goals, define how technology can be used to help achieve these goals, and budget whatever financial and human resources are needed to achieve them. In general, the role of technology within the borough needs to be clearly defined.

Implementation

- **Define an objective:** This should be simple and straightforward: Improve municipal services through the use of technology.

- **Determine what can be done:** Evaluate the borough's current situation, with regards to technology. Repetitive tasks, data entry, and internal and external communication are often good places to start looking. An external consultant with strong technical knowledge would be a significant help here as far as suggesting technical solutions or analyzing the feasibility of programs. Use the above recommendation as an example

- **Plan a time line:** Break each task into specific points of action, and define a target for completion. Setting specific targets ensures that the necessary resources can be allocated for the work.

- **Assess Resources:** Again possibly with a consultant, determine the necessary resources for completing the various projects in the plan. Examine what human and computer resources are available, and how they can be applied to the proposed solutions. Document any shortfalls and budget for them when possible.

- **Plan for Disaster:** One element you may want to include in this technology plan is improved disaster planning. Right now, a fire or flood at the municipal building would have disastrous affects as far as both paper and electronic records are concerned. Develop a routine for backing up the server that includes rotating a backup tape off-site to provide for reasonable disaster recovery capabilities. By digitizing the paper records and maintaining backup copies physically separated from the originals the borough would be able to easily restore it's systems and data in the event of a disaster.

Resources

- One resource for Technology Planning information can be found at *<http://www.techsoup.org/howto/yourstories/techplan/page1458.cfm>* This offers an example of the technology planning process as experienced by one organization, and details the elements of a technology plan as well as many pitfalls to avoid.

- The PSI Group page mentioned above also will be valuable in constructing a technology plan.

Examining strong uses of technology in similar settings should generate ideas regarding how Crafton can best incorporate technology to simplify workflow and provide services.

ABOUT THE CONSULTANT
Joe Arasin is a junior majoring in computer science and minoring in history. He plans to pursue graduate study in the fields of public policy and law.