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"ENHANCING TRANSPARENCY IN LOCAL GOVERNMENT: A NEW MANAGEMENT INFORMATION SYSTEM FOR THE MUNICIPALITY OF SOFIA" A CASE STUDY

*info*Dev PROJECT ID: 256-80116

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Sofia is located in western Bulgaria.

[1] "Bulgaria" *Lonely Planet*, 2003.

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Acknowledgements

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Ronald Gdovic, Ph.D.
Professor of IT and International Economic Development at Carnegie Mellon University

Dinka Dinkova
Director of ARC

Nikolay Badinski
Project Manager, ARC

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Case Study Background

This case study is the result of a collaborative effort between *info*Dev and the H. John Heinz III School of Public Policy and Management at Carnegie Mellon University. *info*Dev is a World Bank grant program designed to fund information and communication technology projects in the developing world in an effort to boost economic and social development. *info*Dev's resources coupled with Carnegie Mellon's keen interest in ICT development proved to be advantageous for exploring the issues and benefits relating to the implementation of the e-government project in Sofia, Bulgaria. The case was written for a Master level course entitled "IT and International Economic Development", taught by Ronald Gdovic Ph.D. The authors are three Heinz School students: Angel Couoh, Christian Isely, and Alvaro Velezmoro. Angel is a Master of Public Management student. Christian is studying International Economic Development for his Master of Science in Public Policy and Management. Alvaro is studying Public Policy Analysis and is also earning his Master of Science in Public Policy and Management.

Relevant Links:

*info*Dev: http://www.infodev.org/

*info*Dev Project Summary:
http://wbln0018.worldbank.org/ict/projects.nsf/414c1d81314845d585256b180057ba4d/73c6e76b5a6a8e2285256b10005b7d0e?OpenDocument

Final Report from the Municipality of Sofia to *info*Dev:
http://www.infodev.org/projects/government/256sofia/256.pdf

ARC Fund of Bulgaria: http://www.arc.online.bg/

ARC Project Summary: http://www.arc.online.bg/mgmis/index.htm

Municipality of Sofia: http://www.sofia.bg

Seoul Metropolitan Government: http://english.metro.seoul.kr/

H. John Heinz III School of Public Policy and Management: http://www.heinz.cmu.edu

Executive summary

Background:

The Municipality of Sofia developed a plan to guarantee the information supply within the metropolitan area. The plan required the installation of a well-structured central database as an essential element to exchange accurate and efficient information within the municipality. This entailed the municipality changing from a paper-based information system to a fully electronic system made possible by the latest in information technology which in this case, happened to be provided by Oracle Financial Analyzer.

The idea of introducing ICT to the municipality originated with Mayor Sofianski, whose knowledge of telecommunications and information systems proved to be a substantial asset. Additionally, since he previously served as the Chairman of the Telecommunications Committee and as the Prime Minister for Bulgaria, the Mayor was able to lend a great deal of political capital to the project. Mayor Sofianski, in conjunction with Applied Research and Communications Funds (ARC), developed the necessary proposal to request funds from interested organizations including the World Bank.

The proposal consisted of the building of a central database which would be available to every municipal department and enterprise. This database would significantly improve the information flows within the municipality and encourage the growth of a more efficient, accountable, and transparent municipal government.

Our Goal:

We intend to provide a perspective on the effectiveness of the newly implemented management information system. In conjunction with this goal, we set the following criteria:

- Identify new capabilities after the project was implemented, assure that the database is reliable, explore the implementation of the project, and discover if there is any room for improvement in the future relating to implementation issues.

- By taking note of the current state of corruption in Bulgaria and comparing the project to other successful transparency projects, we can explore whether the new management information system would be a tool in combating corruption.

Our findings:

Leadership
Leadership matters. Mayor Sofianski, as the primary proponent of the project, proved indispensable to its success.

Implementation
Our findings show that during the implementation process, the biggest obstacle by far was getting the buy-in of the effected employees in the municipality.

The employees themselves had no technical experience and were weary of technological innovation. In response to this challenge, the project entailed courses for the municipal employees. The aim of these courses was to familiarize the employees with the new technology and convince them of its usefulness with regard to their everyday work.

Another finding is that the old system included outdated technologies, inadequate and inefficient information flows, and a lack of LAN connectivity. This had a tremendous influence on the outcome of

the project and the gains afforded by the new system. More research should be done to determine the compatibility of the new technology with existing systems and whether or not this would have an effect on technological choices in regard to the new system.

The goal here is to discover whether or not Sofia is exploiting the functionality of the new system. We would like to confirm with Sofia what attributes of the new system are currently being used. This would reveal how much of a success the implementation process was.

Department Choice
The Finance and Investment departments of Sofia were chosen for the pilot program since the municipality needed a system that was better able to control daily activities and create financial reports by use of an improved data processing system. These departments were not only better able to adapt due to a more updated existing system, they were integral to the everyday running of the municipality itself. Oracle Financial Analyzer was identified as the most suitable system to fulfill these needs.

Security Controls
With regard to security controls, we know through the final report that Oracle Financial Analyzer is able to provide and secure access to the database. The issue here is to know how the ID and password system was designed for the database. Also, the report mentions that most new users do not need password adjustments. Further research on this point is needed.

Transparency and Accountability
A major goal of implementing the new system is to make the Municipality of Sofia more transparent and accountable. Studying other cases of similar projects may prove helpful. In this case, we have brought up the case of Seoul, Korea. However, fighting corruption is a long-term process and the government of Sofia should actively monitor its progress on reaching these stated goals. One method would be to gauge both domestic and international perceptions of corruption. The index corruption reports from the World Bank and other international organizations would be a good source to monitor progress. Additionally, monitoring public perceptions of corruption in Sofia would also provide insight as to the success of the project.

A quick test to measure transparency is to know what new information is available to government agencies and to the public that was not available under the old system. Further research on this topic must be done.

Conclusion:

Leadership matters. The implementation process was successful although additional management techniques may prove helpful if the project is to be expanded. The department pilot choice reflected current municipality needs and the current state of technology. Security controls were effectively implemented but further research needs to be conducted. Comparing the project to other like transparency and accountability projects may prove helpful in determining the future outcome of the project.

Introduction

Citizens, businesses, nations, and international organizations are demanding that governments around the world become more transparent and accountable, and provide more public services effectively at reasonable cost. The introduction of technology into the municipality of Sofia, Bulgaria to satisfy those demands could not be more timely and relevant in today's environment of increased ICT applications to governance issues.

By means of international entities such as the World Bank, the European Union, and other organizations, technology applications are being diffused to many developing countries as well as being expanded in developed nations. These international organizations not only expect that this diffusion of technology will transform traditional governance into e-governance, but that it will expedite economic growth in these nations.

*info*Dev, as an agent of the World Bank granted $250,000 to the municipality of Sofia, Bulgaria to develop and establish a new management information system. This new server would enable the government of Sofia to improve decision making processes within the organization, make more information available to the public, and provide better service to its citizens and businesses.

There is no doubt that the criteria used by *info*Dev in deciding whether to fund the project and others like it is appropriate and justifiable. However, the absence of a methodology used to measure the progress and impact of these projects on grantees leaves the process space for improvement.

It was this need for further analysis and evaluation that spurred us to study this project. It is our aim to discern the effectiveness of the system, explore how the municipality is using it, and how it is helping the government of Sofia to combat corruption. Moreover, we have provided some recommendations where appropriate.

Background

Bulgaria has a population of 8 million, out of which 1.3 million reside in Sofia, the capital and largest city in Bulgaria. Bulgaria has a GDP per capita of $5,710 (PPP), GDP per capita grow of 6.33%, and an illiteracy rate of 1.58%. The Overall Networked Readiness Index of 82 nations reveals Bulgaria with the following rankings: government 55, business 69, firm level technology absorption 74, government prioritization of ICT 65, government online services 61. [2]

Bulgaria's infrastructure is underdeveloped. It has an extensive railroad system, but an underdeveloped highway system. The number of telephones per inhabitant is one of the highest in Europe, but the phone system is antiquated. The institutional infrastructure is especially wanting. Corruption is widespread. The unofficial economy as a percentage of GDP is estimated at 36 percent. [3]

Since a new government took power in late 1990 after the fall of the Communist Bloc, the country has been experiencing significant economic and governmental changes. Tough measures were implemented and the government aimed for the privatization of 72 percent of long term assets by 2000. Measures to fight corruption were also implemented. Financial stability started to appear after these measures were taken.

Sofia has played a key role in these changes. The municipal government has been introducing radical changes in the structure and working style of the central administration with the aim of creating a more efficient management information system.

A significant change made by the municipal authority was to move from a paper-based system to a fully electronically based information system in 2001. The local government realized that a new system was needed to create, access, and analyze information. This new system would decentralize responsibilities, make government more transparent and accountable , and help to increase economic development within the municipality and its 24 districts.

Relevant to the design of the new system was the manner in which the municipal administration of Sofia is structured. It is arranged into functional divisions and divisions are further divided into departments and subordinated services. This complex structure forced the municipality to implement a program able to expedite the information flows between departments and citizens.

Before the new electronic system was developed, the municipality had already developed a plan called "Policy to Guarantee the Information Supply within the Metropolitan Sofia Municipality" with the following operational goals:[4]

- Provide public services and information regarding urban planning, real state, healthcare, legal, etc
- Provide functions of the state administration
- Execute control and supervision on the activities of the municipal firms and enterprises
- Maintain, develop and modernize the municipality's informational database
- Research and specify the customer's requirements for each specific type of information

[2] "Final Report", *Enhancing Transparency in Local Government: Management Information System for the Municipality of Sofia.* InfoDev, June 30, 2001.
[3] Basic Facts of Bulgaria, European Forum Report.
[4] "Final Report", *Enhancing Transparency in Local Government: Management Information System for the Municipality of Sofia.* InfoDev, June 30, 2001.

These goals required the presence of a well-structured central database as an essential element for efficient data exchange at and within each informational segment. This marked the use of a new database system, Oracle Financial Analyzer. This database should be continuously expanded and modernized.

Origin of the Project

The idea for the project came from its current Mayor, Mr. Sofianski, who is a former Prime Minister of Bulgaria and was Chairman of the Telecommunications Committee of Bulgaria. His idea was to implement ICT solutions in the municipality through a pilot program of a municipal government management information system which would expedite the exchange of information within the municipality and to the citizens of Sofia, Bulgaria. This would be the beginning of a wider administrative modernization and decentralization effort in the municipality.

Applied Research and Communications Funds (ARC), a NGO working on ICT projects in Bulgaria, helped the municipality to put together the project idea and apply for funds from the World Bank, the EU, and other international organizations. ARC also played a key role in implementing the pilot program.

Leadership

Introducing new technology to any organization is always a challenge. The implementation of advanced technology in the municipality of Sofia was no exception. A key factor in overcoming this obstacle was the strong support and active participation of the Mayor, the municipality's management team, ARC, and Dinka Dinkova.

Mayor Sofianski played a critical role in gaining political support. His experience in politics and expertise in telecommunications were essential to the development and success of the program. Without his strong support this project would not be in place now.

Mr. Nikolay Badinski, the project coordinator, also contributed significantly to the project. He played an important role convincing employees of the benefits of the program, providing training, and providing technical support as needed.

Also important was support provided by ARC. Its presence and reputation of working with ICT made it possible to develop a convincing proposal to request funds from interested organizations including the World Bank.

Dinka Dinkova also played a crucial role in this project. Her expertise of working with local and international organizations, her involvement, and her support for this program helped to guide the project through the implementation stage.

Leadership matters. The coordination, knowledge, and commitment of all parties set the groundwork for this project to be successfully implemented. Mayor Sofianski, municipal employees, and other parties such as ARC and Dinka Dinkova showed enthusiasm and commitment to implement this project in the municipality thereby successfully engaging e-government solutions in solving organizational problems.

Implementation

The New Database

The municipality's program consisted of building a database of information, which is available to each department of the municipality, and is continuously updated by each segment linked to the database. The municipality also considered the possibility of expanding the reach of the information system to serve citizens and other end-users. One option contemplated was the development of local information kiosks. This section is not to be developed at this stage due to the lack of funding. However, the municipality is looking for grants not only for this idea, but for other related projects.

Currently, the database is divided into two sectors. First, there is information available to departments within the municipality. Second, there is information available to municipal enterprises, which perform their independent business besides their activities with the municipality.

Considering that the database is relatively new, the existing information available satisfies the municipality's needs. Nevertheless, Sofia should consider processing more and more information and more importantly make it available to its citizens and the public.

Capabilities of the Database

The new database has the capacity to handle much more information than the previous information system. The system provides mostly financial information to the municipality's top management in order to make the decision-making process faster and more accurate. We remind the municipality to take full advantage of the abilities of the system. We acknowledge that some more work may be needed to tailor the system to current needs, but it is also important to recognize that the groundwork has been laid and the next stage is to polish the system so that more quality information can be processed. Some of the relevant capabilities are explained in later chapters.

Pilot Program and Department Choice

The Finance and Investment Departments of Sofia were chosen for the implementation of the pilot program. The primary reason for this was the fact that these departments are critical to the workings of the municipal government. As the departments that are responsible for the financial management and budgetary processes for the city, the successful implementation of the pilot program would improve the operations of the entire municipality. Additionally, these departments possessed the most technologically advanced infrastructure and the most technically savvy workforce in the municipality thus making the pilot program easier to implement. Despite this easier implementation process, a successful launch would provide valuable insight into the potentials of the new management information system for other departments. For instance, the implementation of the database showed significant improvements in the execution of the municipal budget such as daily updates in the budgetary process. The work procedures were simplified and the database was better able to balance daily revenues and expenses from the budget reserves and calculate daily finances for each department among other relevant financial operations of the daily budgetary process. These improvements albeit specifically related to the Finance and Investment Departments hold out the possibility of benefits to other municipal departments.

Security Controls

Security controls are a necessity for the creation of any successful database. Successful security controls prevent the manipulation of data by both outsiders and insiders. Since the goal of the project was to implement a more transparent management information system, the creation of security controls was one of the first steps in creating the system. Log-on IDs and passwords were issued to every employee involved in maintaining the database. This is an example of a technical control whereby the technology itself facilitates the security control. However, administrative controls are also necessary and this was accomplished by training the employees on the correct work procedures. By issuing log-on IDs and procedures to the employees, the municipality was able to secure the database and increase accountability.

Oracle Financial Analyzer

The pilot program revealed the need for a final product that would be able to unify the current information system for financial and administrative purposes. The pilot program also revealed the need for a computer based data processing system.

In addition, it was determined that the final product should be adaptable to the current municipal information system and communications network, compatible with other databases and equipment within the municipality and other governmental offices, and allow for future expansions and upgrades.

Oracle Financial Analyzer (OFA) was determined to be the most suitable system to meet these criteria. [5] Here are some of the most relevant functionalities of Oracle Financial Analyzer:

- Budgeting and Forecasting
  It handles creation of budget, forecasting, and communications within the network. It also allows budget allocation from higher to lower levels, consolidation, closing, and prevents additional modification after period end.

- Financial modeling
  OFA provides a wide variety of instant financial modeling. These functions help managers to create forecasts, measure performance through financial ratios, and incorporate general ledger and non-ledger data for analysis.

- Flexible Network Architecture
  The system is able to work with spreadsheets and web-based works, offering more flexibility for the municipality and its entities to use a wide variety of data. Also, OFA can easily accept valid data from other databases and operational systems.

- Controlled Data Access
  The system can maintain the integrity of financial data and ensures users local and remote access. Access controls allow the administrator to determine, by user, what information can be viewed and edited.

[5] *ibid.*

Additionally, the database has nine dimensions integrated into its processor.

• Time	• Currency	• Municipalities
• Income	• Ordinances. Orders	• Municipal Enterprises
• Expenditure	• Priorities	• Years

These functionalities and dimensions enable the municipality to organize, process, and have access to the information as needed. Furthermore, these characteristics allow flexibility for future expansion.

There is no doubt that Oracle Financial Analyzer is a complete and suitable system that would allow upper management to expedite and make more accurate decisions. Furthermore, it is a useful tool to make more transparent the municipality's activities and help it to combat corruption.

Choice of Oracle Financial Analyzer

After analyzing the needs of the municipality and the attributes of the software in question, it was concluded that Oracle Financial Analyzer was the proper tool to be installed during implementation. It was determined that this software would enable the establishment of a centralized data processing system and a unified system for financial and administrative reporting.[6] Essentially, this new software program would provide the very basis and structure for the new management information system. The choice of Oracle Financial Analyzer was determined by the following criteria:

- adaptability with the establishment of a municipal management information system and communications network
- compatibility with the establishment of unified databases in each information sector of interest to the Municipality
- compatibility with the existing equipment and communications facilities
- minimization of financial and personnel resources
- built-in scalability of the system to allow future upgrading and expansion
- attunement with existing information systems of other central government departments and agencies[7]

Oracle Financial Analyzer was determined to meet all of these criteria and was therefore chosen as the product to be implemented.

In addition, the software had particular attributes that made it suitable for the Municipality of Sofia. First, Oracle Financial Analyzer is particularly adept at handling the budgetary process including budgetary forecasting. Its functions allow administrators to have a better picture of the budgetary situation and therefore permits more informed decision making by the managers of the Municipality. Oracle Financial Analyzer is also very useful in that it can adapt to almost any organizational structure. That is, the technology can be adapted to fit already existing information flows thus making implementation all the more easier. However, one of the most valued advantages of the software is the time that it saves. Whereas the previous system required two months to process the budget, Oracle

[6] *ibid.*
[7] *ibid.*

Financial Analyzer enables the same process to be done in half a month thus saving the municipality unnecessary expenditures.

Another important factor in the choice of Oracle Financial Analyzer is the control of data access. The software enables the administrator to determine what kind of information will be accessible at the different levels of the organization to make sure that the correct information gets to those who need it. By use of passwords the administrator enables different users to access their required information from the central database. Again, Oracle Financial Analyzer is extremely adaptive and can make use of any names or passwords in use in the previous system. For these reasons, Oracle Financial Analyzer was the product chosen to implement the new management information system. Next, this paper will explore the actual introduction of the software into the organization and any challenges that surfaced during this process.

Stakeholder Buy-In

The implementation process of any project can often be extremely challenging. The conception of the idea and the decision to go ahead are often easy compared to getting the organization to actually adopt the new system or new way of doing things. For the Sofia transparency project, this proved to be no different. The successful implementation of the project entailed the buy-in of the leadership, management, and employees. Even though this project was ultimately successful, implementation did raise some striking challenges. In fact, Dinka Dinkova stated that getting buy-in during the implementation process was one of the three greatest challenges ARC faced in carrying out the project.[8]

The first step to implementing any project requires the buy-in of the executive or leadership. In the Sofia case, this did not prove difficult since the idea for the project came from the executive himself, in this case, the Mayor. He conceived of the idea as a means to make municipal government more transparent and effective. The next class to tackle is the upper management. Again, the Mayor proved extremely useful. As a former Prime Minister of Bulgaria and Director of Telecommunications for Bulgaria, he brought a great deal of political capital, technical expertise, and tremendous enthusiasm to the project. Gaining the buy-in of the upper management proved relatively easy as most were on the same page as the Mayor.

One of the biggest challenges facing the entire project consisted of gaining the buy-in of the municipal employees whose everyday jobs would be affected by the introduction of the new technology. Clearly, even with the Mayor's full support and the buy-in of the leadership and management, the project would not get anywhere if the actual users of the new system refused to be open to change and incorporate it into their work. The majority of these were middle aged people who had worked for the municipality a long time and were very set in their ways. The municipality has not been successful in recruiting a younger skill set largely because of the low salary it offers. Dinka Dinkova described the demographics of the municipal employees, "The young people, as a rule, are not attracted to municipal jobs. These would be mostly middle aged people, technically not very savvy; underpaid, overworked, middle age people. Not motivated to adopt the technology."[9] This older labor force had been accustomed to the old paper based way of doing things and was extremely wary of changing their routine. Very few municipal employees had access to a computer to begin with. Dinka and Nikolay both mentioned in the interview that these employees were not technically savvy and were unaware of how the introduction of the new system would change their jobs for the better in terms of efficiency.[10] Indeed, this is not an uncommon occurrence for organizations adopting new technologies to increase effectiveness and efficiency. However, what made implementation in this case particularly challenging was the scope of the project. This was not a gradual adoption of technology. Essentially, the project entailed the municipal departments effected going from a largely paper based to a computer based system overnight.

[8] *Interview with Dinka Dinkova and Nikolai Badinksy*, April 18, 2003.
[9] *ibid.*
[10] *ibid.*

In response, the ARC team had to organize an extensive preliminary program to gain buy-in by the effected employees. Nikolay mentioned the use of courses to familiarize employees with the technology.[11] These courses were for many of the employees their first encounter with a computer. Not only did the courses have to teach middle-aged workers with no former knowledge of information technology, they also had to convince the adopters of the usefulness of implementing such a system. Additionally, the courses would have to instill a high degree of confidence in the employees with regard to their ability to use the new technology. Nikolay stated that in the end, they considered implementation a success because municipal employees did in fact adopt the new system and applied it in their day-to-day activity.[12]

The ARC team conducted courses to familiarize and convince the would-be adopters of the value of the new system and this proved a success. However, might there be other tools that could be used to gain buy-in? One management technique that is often overlooked in system implementation is the use of informal networks within an organization. Often times, organizational change is implemented in accordance with the existing formalized hierarchy. That is, instructions are given to supervisors who are expected to gain the buy-in of their subordinates. This represents a top down approach. However, all organizations have informal networks that connect people in different departments and across vertical hierarchical boundaries essentially forming alternate hierarchies that can sometimes undercut and contradict the formal organizational structure. These informal networks exist in two forms, friendship networks and advice networks. Friendship networks consist of friendships between employees. These ties of loyalty can often times prove stronger than loyalty to a supervisor. Advice networks provide employees with a means to seek out advice on everyday work related questions without having to go to a supervisor. When one does not take these existing networks into account, implementation can be slow or impeded by varied loyalties and information flows.[13]

The answer is to discover the layout of these networks and take them into account when implementing the new system. One common and successful method to utilize these networks is to single out individuals who have central positions in the friendship and advice networks. That is, locate those individuals who are considered to be a friend by many other individuals and those who are sought out for advice. Questionnaires are one way to gather this information. Once this information is gathered, the implementation process should not only hold courses for every employee to be affected but should also target these afore mentioned individuals for buy-in. The ideas is that once these individuals are converted to the new system, getting the buy-in of their colleagues will prove much easier as these individuals will convince them of the value of the new system. Some adopters might only respond to one-on-one meetings. Clearly, in many cases, organizations cannot afford to sit down with every effected individual to convince them of change. By getting the buy-in of key individuals in the informal networks, the organization can essentially let the employees convince themselves. Key individuals will convince their colleagues largely through one-on-on encounters thus enabling the organization to invest time and energy into other implementation tools.

Another challenge in implementing new technologies to increase transparency is the very goal that must be achieved, the elimination of corruption. Corruption provides an additional source of income to employees. They therefore have a disincentive to implement any program that will effectively reduce their income. The quandary then becomes: how does an organization overcome the incentives to engage in corrupt behavior and therefore make it possible to implement a more transparent information system which will effectively reduce future levels of corruption? In this case, it is helpful to examine the root causes of these corrupt practices. As Dinka stated, these employees are overworked and underpaid. Since people engage in corruption to supplement their income, one answer would be to provide raises for the employees one is trying to convert on implementation. Simultaneously, the leadership can increase

[11] *ibid.*
[12] *ibid.*
[13] Krackhardt, David and Hanson, Jeffrey. "Informal Networks: The Company Behind the Charts" *Harvard Business Review*, July/August 1993, Vol. 71, Issue 4.

their vigilance and punish corrupt behavior more severely. By taking away the incentive to be corrupt and raising the costs to those who engage in corrupt behavior, the organization should be able to convince the employees that it is in their interests to implement the new system. Another strategy would be to convince the employees that implementation is inevitable. This does not have to be done explicitly but rather can be done implicitly and through comments made to individuals on a one to one basis. The informal networks come into play here as well. When corruption is endemic to an organization, employees are more likely to engage in corruption since the perception is that everyone else is also corrupt. However, if an organization can successfully identify the influential members in the informal networks and wean them off of corrupt practices, then their colleagues are likely to follow suit. Although corruption can be attacked explicitly via general meetings stating the new policies to combat corruption, one-on-one meetings with influential employees where corruption is implicitly attacked are also likely to yield results.

Getting the buy-in of individuals in an organization is one of the most difficult challenges faced during the implementation of a new technological system. The Sofia case proved particularly challenging due to the largely paper based system used until implementation and the corresponding lack of familiarity with technology among the municipal employees. Despite this obstacle, ARC successfully used strategies to gain adopter buy-in. Providing courses for familiarizing employees with the technology and convincing them of its usefulness had the intended results. With regard to any similar future projects or the proposed extension of this technology to other departments, the use of informal organizational networks could also prove extremely useful. By discovering the roles of key players, ARC could target these people and use them to gain the buy-in of their colleagues. Any successful attempt at easing the implementation process will encourage further implementation by other departments and serve as encouragement to the primary proponents of adopting the new technology.

Transparency and Accountability

The project has as its objective the promotion of accountability and transparency in the municipal government. The goal of this increased accountability and transparency is to provide better service to the community of Sofia. Furthermore, through proper use of technology, the government can use its time more efficiently and save money. However, the city of Sofia had more modest expectations with the implementation of the new system. Following is Dinka Dinkova's description of the project:

> The *info*Dev project was much more modest... The main purpose was to see how ICT can be applied to improving the efficiency and effectiveness of municipal management processes. The system provides information (mostly financial data) in electronic format which assists the municipality's top-management layers (i.e. the mayor and his deputies) in making adequate and timely decisions concerning how and where best to spend the municipality's scarce financial resources. (Until then this process was entirely paper-based.)(…)
>
> The efficiency of the system can hardly be measured by its direct (economic) impact since it was only a pilot stage... Rather its impact should be seen in the learning process... For many local government officials, this project has been an 'eye-opening experience' into the potential which ICT holds for improving the efficiency of internal operations and providing better service to the citizens and the business community. [14]

[14] Email received by Angel Couoh Angel-Couoh@gnc-hq.com on 5/2/03 12:07 PM -0400 from: Dinka Dinkovadinka.dinkova@online.bg Subject: RE: Project ID: 256-80116.

The aim was the creation of a secure network and central database that reaches across the 24 districts and departments permits the centralization of information in the Municipal Council. The use of this system reduces incidences of fraud by making the details of transactions secure and confidential. The new centralized database registers the financial operations in the Municipality. This allows managers to receive accurate data regarding the financial information of the Municipality at any time. The Mayor and the Municipal Council are in effect gaining increased oversight over budget operations. One consequence of the successful implementation of the project is that it redistributes power to elected representatives like the Municipal Council and the Mayor and away from appointed or career track employees thus making the municipality more democratic.

Transparency & Corruption

Transparency is defined broadly as access to information. More specifically, it can mean that the right information gets to those who most need it when they need it.[15] Additionally, the more transparent the organization, the less corrupt it tends to be. However, it is not only the presence of corruption that matters but also the perception of the degree of corruption by the public for this can have a drastic impact on their relationship with the government and other institutions within society. Many times, the presence of corruption reflects the absence of effective political institutionalization[16] making corruption one of the most common challenges that developing and transition economies face. By taking note of the current state of corruption in Bulgaria, we can explore how the proposed project would be a useful tool in finding a solution to endemic corruption.

In taking account of the possible positive consequences of the project, we will look at other similar projects that have succeeded. The municipal government of Seoul, Korea could provide some useful insights with regard to its anti-corruption measures. The research for this portion of the paper shall be conducted with regard to current corruption figures and the outcome of the Korean example.

For Anti-corruption measurement, we have used data from Vitosha Research, a group that conducted a quantitative sociological survey among business managers of 331 state-owned and private enterprises in Bulgaria. The survey was conducted in 2000 and the methodology consisted of face-to-face interviews with business managers. The main hypothesis was that "the overall impact of corruption is the worsening of the business environment". More specifically, corruption generates additional costs to business and distorts the conditions necessary for normal competition. The following survey reveals corruption as the third challenge to investing in Bulgaria:

Serial	Which are the main problems to invest in Bulgaria?	Percentage
1	Unemployment	61.30
2	Low incomes	52.30
3	Corruption	51.70
4	Poverty	26.90
5	Unfavorable conditions for the development of the private business	26.60
6	Insufficient foreign investment	23.60
7	Crime	15.10
8	Politically Instability	11.20

Source: Vitosha Research, 2000.[17]

[15] Transparency International. http://www.transparency.org
[16] Samuel Huntington. " Modernization and Corruption". 1989.
[17] Vitosha Research. http://www.online.bg/vr_new/corind/oct2002%E5.htm#3

The survey also included a second set of questions concerning "the level of moral acceptability of the different corrupt practices for the business managers". 80% of the managers said they felt that corrupt behavior was unacceptable while only 10% said they felt corrupt behavior was acceptable.[18]

When the survey asked, "which public server do you consider accessible to corruption?" the answers were:

	Which public server, do you consider accessible to corruption?	Percentage
1	Customs	90.4
2	Political leaders	70.4
3	Tax inspectors	67.3
4	Police	62.3
5	Local Political leaders	58.3
6	Judges	56.6
7	Employees local administration	52.3
8	Municipal Councilors	41.2

Source: Vitosha Research, 2000.[19]

Although employees in the local administration and municipal councilors rank near the bottom on this chart, the case is still clear, the perception of corruption in these two groups is still very high.
The Vitosha Research Group also mentioned the most widespread forms of corruption in Bulgaria. The following chart reveals that the most common corrupt practices are in the distribution of public procurement and privatization auctions:

Kind of Corrupt behavior	Percentage
Bribe taking by employees and politician to influence the distribution of public procurement	78.6
Bribe taking by employees and politicians to win the privatization auctions	88.5
Bribe taking by employees and politicians for issuance of licenses or permits for lawful activities	85.6
Bribe taking by employees and politicians in tax hiding or reducing taxes	68.6
Accepting money or gift for performing work duties	73.7

Source: Vitosha Research, 2000.[20]

In conclusion, corruption is a very difficult phenomenon to study by its very nature. However the perception of corruption can be a very useful indicator. The research conducted by the Vitosha Research Group reveals the prevalence of corruption in Bulgaria via this method. If the measures taken by the

[18] *ibid.*
[19] *ibid.*
[20] *ibid.*

government to increase transparency are to be appraised, this type of research will be very useful in the future, especially when evaluating the success of e-government projects.

Accountability and "One Way" Information

The municipality implemented the project using the basic principles of accountability:

- The use of ICT in the creation of the budget allows the development of multi-year frameworks to ensure that the Municipal Council and Mayor are properly informed and making the accurate decisions.
- The Municipality accounts would be more transparent and easier to audit. A second stage of the project includes the diffusion of the Municipal Audits reports.
- The Municipality Finance Department was ready to inform about the debt and credit situation of the Municipality. It was also ready to report on revenue collection situation.
- Auctions with regard to municipal contracts were openly advertised. Information about the award organizations, the execution of contracts, and information regarding the use of municipal funds is to be made available.

The Municipality implemented "one way" services for use by businesses and citizens. "One way" services refer to the information that businesses and citizens can pick up from the web page without possibility of contacting the senders of the information.

Relating to the "one way" services for businesses, the municipality home page offers information about two major projects undertaken by the Municipality of Sofia. The information includes procedures on how to apply for contracts relating to the projects. The first project is the extension of the Sofia Metro. The second project is the rehabilitation of the Central Railway Station Plaza. The municipality also provides information on projects yet to be implemented.

Source: Municipality of Sofia Home Page.[21]

[21] Municipality of Sofia Home Page http://www.sofia.bg

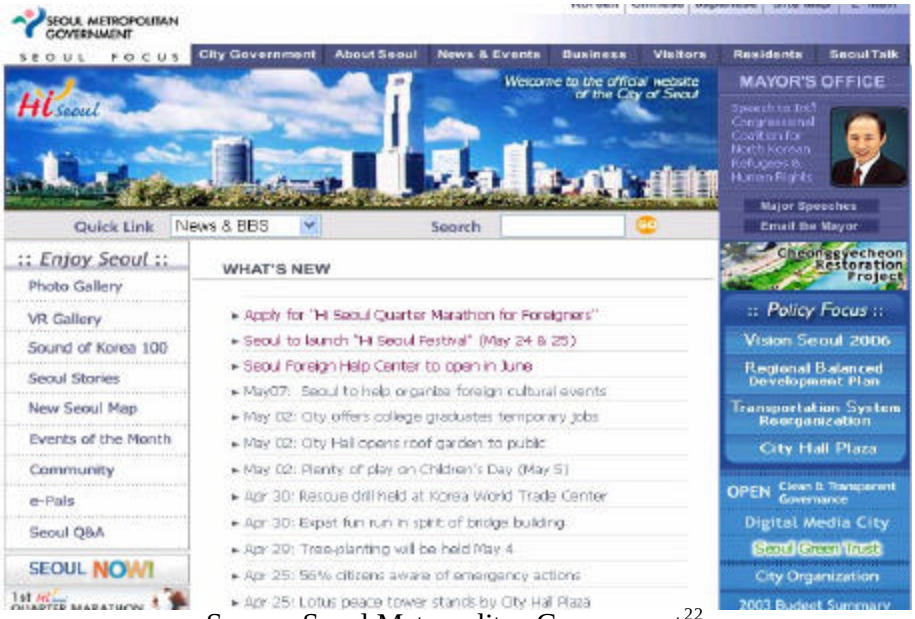
In addition the home page offers information on the Sofia Municipality Privatization Agency and contains information about the advantages of investing in Sofia and the general business environment.

Other "one way" information accessible for citizens and businesses include:

- History of the city of Sofia
- E-cards
- GIS map of Sofia
- Images of Sofia
- Information on the Municipal Council
- City links

The city of Sofia is making progress in transforming its services via e-government solutions. The services available to citizens and the public are currently limited but are being continuously expanded and developed. The "one way" information channel must also be converted into a "two way" channel so that people can participate more actively in local government. This would also improve transparency.

The Example of Seoul, Korea



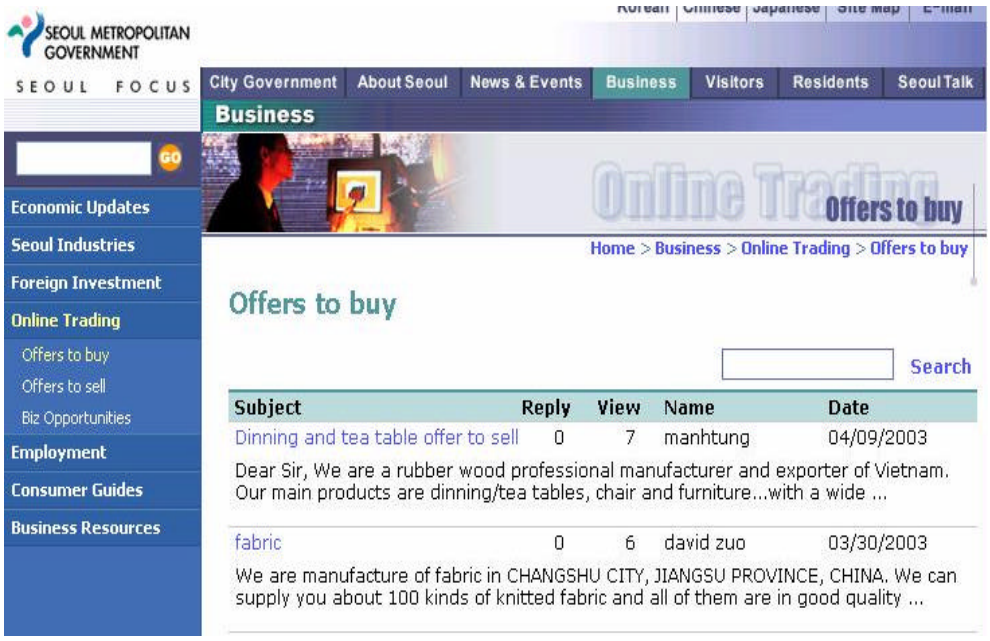
Source: Seoul Metropolitan Government[22]

The Municipality of Seoul web page is useful as a model for the services it provides to its citizens and businesses. In particular, the municipality offers the OPEN system, an innovative means of displaying administrative processes on the internet which are open to the public. This system enables citizens and businesses to follow up on license and permit applications and has resulted in greater government transparency and accountability. The OPEN system provides accurate information about bids for municipal development projects, an e-market place for goods to be exchanged between both individuals and businesses, and vital sources of information for businesses and consumers. The web page offers these services in Japanese, Chinese, Korean, and English.

The creation of e-government markets for municipal contracts has produced a more transparent contract awarding system. An example of this e-marketplace where suppliers and contractors can submit

[22] Seoul Metropolitan Government Home Page http://english.metro.seoul.kr/

bids and offers to the Municipality and to each other and seek information on submissions is provided below:



Source: Seoul Metropolitan Government Home Page http://english.metro.seoul.kr/[23]

In addition the web page offers information concerning markets, including labor information, taxes, and the distance between specific Asian cities.

E-democracy has also become important in the effort to expand e-government. "Especially at the local level, governments are using the Internet as an interactive communication tool to give citizens an opportunity to influence decision making and to gather information."[24] The Seoul Municipality web page is also a good example of digital democracy since it includes active consultative interfaces for citizens and businesses and a means of monitoring government activity. Clearly, the example of Seoul raises many possibilities for the future of e-government throughout the globe. The Municipality of Sofia can benefit from Seoul's achievements by striving to implement similar systems.

[23] *ibid.*
[24] *info*Dev. *The Global Information Technology Report*. 2003.

The Next Step for Sofia

The Municipality of Sofia has just entered the first step toward the development of local e-government. The municipality of Sofia is aware that there are many challenges ahead in the pursuit of expanding e-government services. We recommend that the government of Sofia refer to the Seoul case and use it as a parameter to measure its progress.

Sofia's future e-government expansions:

- The delivery of B2G and C2G services. These services have to be tailored according to the needs of businesses and citizens. This information has to be delivered securely and with high speed. Services such as the payment of taxes, consultation, and information about housing will be provided by the municipality.
- The next step is the establishment of an e-market place like the one provided by the Seoul Metropolitan government, where authorized suppliers can submit bids and offers as needed.
- The final step is the move toward digital e-democracy where local authorities exchange information and interact with citizens and businesses. This stage includes voting and other public opinion consultation concerning the making of the municipality decisions.

The implementation of the Management Information System will link and provide information to all departments and districts within the municipality. As a result of this linkage, the government will be a better decision maker, enhance transparency for its activities, and successfully combat corruption. The successful implementation of this new system will make the future steps for Sofia possible.

Findings

Leadership
Leadership matters. Mayor Sofianski, as the primary proponent of the project, proved indispensable to the success of the project.

Implementation
Our findings show that during the implementation process, the biggest obstacle by far was getting the buy-in of the effected employees in the municipality since the technological sophistication of the organization was low to begin with.

The employees themselves had no technical experience and were weary of technological innovation. In response to this challenge, the project entailed courses for the municipal employees. The aim of these courses was to familiarize the employees with the new technology and convince them of its usefulness with regard to their everyday work.

Another finding is that the old system included outdated technologies, inadequate and inefficient information flows, and a lack of LAN connectivity. This had a tremendous influence on the outcome of the project and the gains afforded by the new system. More research should be done to determine the compatibility of the new technology with existing systems and whether or not this would have an effect on technological choices in regard to the new system.

The goal here is to discover whether or not Sofia is exploiting the functionality of this system. We would like to confirm with Sofia what attributes of the new system are being currently used. This would reveal how well implementation was achieved.

Department Choice
The Finance and Investment departments of Sofia were chosen for the pilot program since the municipality needed a system that was better able to control daily activities and create financial reports by use of an improved data processing system. These departments were not only better able to adapt due to a more updated existing system, they were integral to the everyday running of the municipality itself. Oracle Financial Analyzer was identified as the most suitable system to fulfill these needs.

Security Controls
With regard to security controls, we know through the final report that Oracle Financial Analyzer is able to provide and secure access to the database. The issue here is to know how the ID and password system was designed for the database. Also, the report mentions that most new users do not need password adjustments. Further research on this point is needed.

Transparency and Accountability
A major goal of implementing the new system is to make the Municipality of Sofia more transparent and accountable. Studying other cases of similar projects may prove helpful. In this case, we have brought up the case of Seoul, Korea. However, fighting corruption is a long-term process and the government of Sofia should actively monitor its progress on reaching these stated goals. One method would be to determine whether corruption has been effectively reduced. The index corruption reports from the World Bank and other international organizations would be a good source to monitor progress. Additionally, monitoring public perceptions of corruption would also provide insight as to the success of the project.

A quick test to measure transparency is to know what new information is available to government agencies and to the public that was not available under the old system. Further research on this topic must be done.

Conclusion

ICT technologies have played a huge role in the pursuit of transparency and accountability by organizations. The Municipality of Sofia was no different. This city saw the opportunity to improve its services to the community by implementing a new management information system based on the latest technology, in this case, Oracle Financial Analyzer. Leadership played a pivotal role in conceiving and implementing the project. Mayor Sofianski enlisted the help of ARC and successfully applied for funding from several international organizations including *info*Dev at the World Bank. During implementation, the most difficult obstacle was getting the buy-in of the municipal employees. This challenge was met by giving courses and workshops on the functions of the new system in order to convince the employees of the usefulness of the technology. Although this proved successful, this paper recommends the use of informal networks in future implementation projects.

Since the goal of the project was to increase efficiency, transparency and accountability, we found it necessary to explore the implications of the new system. Corruption is often times a difficult problem to overcome in developing and transition economies. Bulgaria is no different. It is our belief that the new system will prove to be a useful tool in combating corruption. We have taken the case of Seoul, Korea in order to explore the possible benefits of the new system. Despite obvious differences between Seoul and Sofia, it is our belief that the Korean example reveals how successful e-government applications are in improving transparency and accountability. Assuming the Seoul case is a guide to the success of e-government solutions, the implementation of the Municipality of Sofia project is a tremendous step in the right direction. If the municipality takes full advantage of the success of this project, the benefits for the citizens of Sofia could be immense as their government becomes more efficient, transparent, accountable, and more responsive to their needs. With the benefit of strong leadership by both the mayor and NGOs like ARC and the lessons learned during implementation of the pilot, the success of the Sofia project holds out the prospect of better governance in Bulgaria and to other transition and developing countries.