

***Multidisciplinary E-Government Research and Education as a  
Catalyst for Effective Information Technology Transfer to Regional Governments***

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Electronic government systems have an unprecedented potential to improve the responsiveness of governments to the needs of the people that they are designed to serve. To this day, this potential is barely beginning to be exploited. Significant barriers hinder the effective integration of information technologies into government practices and their adoption by the public. Government agencies often find themselves in a disadvantaged position to compete with the private sector for information technology workers, a workforce whose shortage at a national level is well recognized. The need to abide by rigid procurement practices makes it virtually impossible for agencies to keep their technology infrastructure up to date with the fast pace of technological advances. For instance, Amdahl's law, a well known technological trend, predicts that processing speed doubles approximately every two years. Today, this trend shows no sign of slowing down in the near future. Local and regional governments are particularly affected by this state of affairs.

A multidisciplinary group including researchers from the University of Puerto Rico-Mayagüez (UPRM) and personnel from the municipal government of the City of Mayagüez combine their talents in Public Administration, Computer Science, Engineering and Social Sciences, in order to: identify significant barriers to the effective transfer of information technology into government practices and their adoption by the public, engineer novel solutions to help overcome these barriers, and test their solutions in a real municipal governmental environment. The team from the city of Mayagüez will include experts on Information Systems, Engineering and Public Administration. The technical side of the UPRM group encompasses faculty members with expertise in Distributed Data Base Systems, Information Retrieval, and High Performance Computing. From the Social Sciences the UPRM group includes faculty members with expertise in Political Sciences and Psychology.

The research plan includes a series of activities expected to generate significant original contributions in Electronic Government, Information Retrieval, Distributed Databases, and Social Impact of Technology. More specifically the proposal will conduct research in the following areas: (1) Multi-lingual information archiving and retrieval of governmental repositories, (2) Automatic representation and extraction of semantic information from government documents, (3) Wide-area secure collaborative government-government databases, and (4) Economic and social barriers to technology adoption by common citizens.

The education plan will involve students in the design and development of original solutions to real problems faced by the city of Mayagüez. Undergraduate students from the various disciplines will work together in multidisciplinary teams under the direct supervision of UPRM Faculty members. Graduate students will work towards completing thesis at both masters and doctoral levels. Each student will be expected to conduct his/her project during a period of a year and will be required to follow the best professional practices and standards of their corresponding professions. The process will include several phases: meeting with City officials and personnel in order to identify problems, writing a formal proposal including a preliminary design of the solution, developing the solution, writing a final report, and finally presenting the project achievements in an e-government workshop to be held at the end of each academic year during the duration of the project. All projects will be required to some element of novelty. The

process will provide student with an invaluable opportunity to improve their language and communications skills in preparation for a successful career in the future.

## **Year I Highlights**

During the first year of funding we have initiated the design and development of the first wave of one year long software projects impacting three major offices providing direct services to the citizens of the City of Mayagüez. More than ten (10) senior-level Computer Engineering students have been involved one way or another in these projects.

The system being designed for the Municipal Department of Public Works will file citizen's service requests electronically, automate the distribution of tasks to employees, provide direct feedback to citizens about the status of their requests and generate reports on expenses and time spent serving the public. Similar systems will be developed and deployed at the Municipal Office of Citizens Services and the Municipal Office of Housing.

All these systems have been carefully designed to take advantage of open source and freely available software packages and tools such as the Apache web server, the MySQL database system, the Tomcat application server and Java servlet technology. This choice is critical for maximizing the chances that a small municipality like Mayagüez keeps up with the continuous upgrades that are to be expected from any software component of moderate complexity. Our team has also been careful to design keeping in mind the potential for tailoring any developed technologies to the particular needs of other municipalities in the region. All our systems will be web-enabled requiring minimal software to be installed at the client stations thus maximizing the chances that the technologies will be directly accessible to citizens in need of service.

Our e-government team has also begun to address a number of critical social issues including: estimation of the extent of Internet access among the population of the research municipality; estimation of actual Internet usage, including time spent online and the nature of online activity with particular emphasis on identifying access to governmental resources; and description of extent and nature of barriers to Internet access and usage. The social component will also measure changes in the above factor as the project systems are deployed.

We will hold our first annual congress on May 7 on our campus in Mayagüez. The congress will include a morning of technical project presentations and an afternoon of parallel workshops. The goal of the workshops is to transfer technological knowledge to the municipal personnel that will have the responsibility of administering and running the new systems once deployed. One workshop will be oriented towards users of the applications while another will be focused on training system administrators and software developers.

## **References**

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