



# CITY OF SAN ANTONIO

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September 9, 2005

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Councilwoman District 7

Christopher "Chip" Haass  
Councilman, District 10

J. Rolando Bono  
City Manager

Ladies and Gentlemen:

RE: Final audit report review of "SAP Customer Relationship Management Under Development"

The system development review of the SAP Customer Relationship Management System (SAP-CRM) was performed between November 2004 and April 2005. This review was designed to assess the propriety of the internal control environment and risk management framework for the service processes incorporated within the SAP-CRM project scope. Primarily the process relating to citizens inquiry or request for City services used by the Customer Services / 3-1-1 Department was reviewed. Additionally, the review intended to include an assessment of risk management practice and internal controls used by the project team to ensure the project was successfully implemented. Due to the abrupt cancellation of the project during the audit, the SAP-CRM project management objective was not fully addressed. However, a general observation relating to project management and development methodology for computer system projects is included in the report.

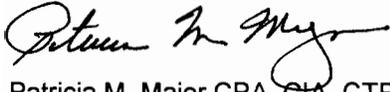
In 1995, the Standish Group, a widely recognized consulting firm, published the landmark study of IT project failure, "The Chaos Report" and updated the results with "Extreme Chaos" in 2001. The 2001 study continues to confirm that the majority of application projects either failed or are challenged upon completion. The survey states that only 28% of application project deliveries are categorized as successful; meaning the project is completed on time and on budget, with all features and functions originally specified. The Standish Group research shows that 46% of successful project used a formal project management framework, compared to 30% of challenged and failed projects.

The audit team did not provide an opinion on the positive or negative merits of canceling the SAP-CRM project. However, the audit report does address a concern that small and large application projects City-wide continue to be initiated without the benefit of a formal system development methodology and project management framework. Considering the extreme challenge to deliver a successful application project, the report recommends City Management formally adopt a system development methodology and project management framework to provide guidance for future projects. Additionally, City Management needs to foster an environment that includes effective executive sponsorship, an engaged steering committee and an organizational governance process that connects business needs to project development to help

ensure computer system projects are successful; meaning completed on time and on budget, with all features and functions originally specified

The audit team appreciated the cooperation and assistance extended by the Enterprise Resource Management, Customer Service / 3-1-1, Public Works, SAMHD – Animal Care, Code Compliance, and Information Technology Services Departments in performing this review. The Internal Audit Department is available to discuss the details of this report with you at your individual convenience.

Sincerely,



Patricia M. Major CPA, CIA, CTP, CGFM  
City Internal Auditor

cc: Michael Armstrong, CIO – Assistant City Manager  
Erik Walsh, Assistant to the City Manager  
Hugh Miller, Director, ITSD  
Antonio Bosman, Director, Customer Service / 3-1-1  
Troy Elliot, ERM Project Director  
Martha Sepeda, Interim City Attorney  
Leticia Vacek, City Clerk  
Central Library Branch



**CITY OF SAN ANTONIO**  
**INTERNAL AUDIT DEPARTMENT**

**Audit of SAP Customer Relationship Management  
System Under Development**

**Project No. AU05-008**

**Release Date: September 9, 2005**

Prepared By:

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### **Background**

In November 2004, the City's Enterprise Resource Management (ERM) Wave C Project Team renewed its effort to implement SAP's Customer Relationship Management (SAP-CRM) module with a "Go-Live" goal of July 25, 2005. The Project was kick-started in November 2004 by leveraging preparation and design work completed during the prior attempt to deploy SAP-CRM from July 2002 to August 2003.

During March 2005, while the project was transitioning from the Business Blueprint (design) to the Realization Phase, the project team abandoned the SAP-CRM solution in favor of delivering the required functionality by enhancing existing legacy systems including Enhanced Code Compliance Enforcement System (ECCO), City Animal Tracking System (CATS), Information and Request for Services System (IRSS) and Tracking System for Public Works (TSPW). The primary impetus was redeployment of information technology personnel to higher value development activities, such as electronic procurement and ERM Waves D, E and H post-implementation support issues. An overview of the SAP-CRM implementation methodology has been included as Figure 1 on page 2 of this report.

The audit team ceased work on this review in April 2005 because of the City's changed implementation strategy for the Customer Relationship Management System. This report describes the work and observations completed up to that time.

### **Customer Relationship Management System Description**

SAP-CRM was designed to track a citizen's initial request for service to final resolution. Once the service was completed, the servicing department would have closed the service request in the ECCO, CATS or SAP Plant Maintenance module (SAP-PM) and notify the citizen that the service had been completed by telephone or automated e-mails. The primary users of SAP-CRM would have been the Customer Service/3-1-1, Public Works, Environmental Services, Code Compliance, SAMHD – Animal Care, Management Team and Mayor / City Council Departments. City Management's primary objectives for implementing a more robust customer relationship management system included:

- Better and faster customer follow-up
- Improved service delivery accountability
- Enhanced interoperability between the City's computer systems and other governments and service providers.

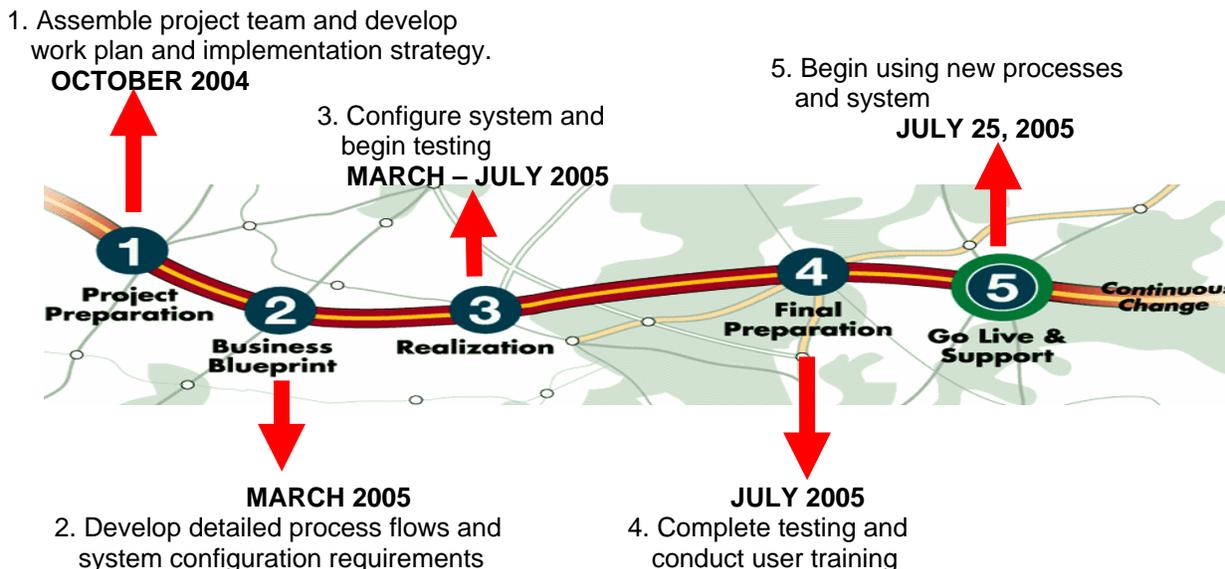
The SAP-CRM System was designed to maintain a catalogue of City service products (repair street pot-hole, dead animal pick-up, etc.) associated with a service level agreement. The 3-1-1 Call Center Representatives would have selected the appropriate service product based on predefined interactive product scripts. These interactive product scripts would have helped the 3-1-1 Call Representatives capture the service request information needed by the servicing department. SAP-CRM would have automatically sent a service request to one of three systems, depending on the nature of the work; ECCO for Code Compliance, CATS for SAMHD-Animal Care and SAP-PM for all other departments. The receiving department would have then scheduled and documented the required service in one of these three systems. Once the service was completed, the department would have closed the service request in the system the service was received in and "closed the loop" by notifying the requestor that the service had been completed.

Features not included in SAP-CRM Phase One that had been postponed for future development:

- *Citizen Internet Service Request* - CRM functionality to allow citizens to create service requests and view request status via the Internet.
- *ITSD Help Desk* - Functionality to use CRM for Information Technology Help Desk tracking.
- *Customer Feedback Tracking* - Functionality to assist with tracking customer satisfaction surveys.
- *Financial Transaction Entry* - Ability to record payments received at the City's Customer Service Centers.

The original ERM Project Schedule Phase Three Scope of Work dated August 2002 scheduled SAP-CRM to be implemented in May 2003. In August 2003, this implementation date was revised to January 2004. During October 2003 the implementation date was again revised to July 2005, as reflected in Figure 1 shown below.

**Figure 1 – ‘AcceleratedSAP’ (ASAP) Implementation Methodology and SAP-CRM Project Schedule Envisioned In ERM October 2003 Project Schedule Revision**



### Objective

The objective of this audit project was to determine the adequacy and propriety of the internal control environment and risk management process used to manage risks related to: 1) SAP-CRM ‘Fulfill Citizen Request for Service’ process, and 2) SAP-CRM project management for software development.

### Scope

The scope of this audit project included reviews of the system design for the following areas:

- ‘Fulfill Citizen Request for Service’ process
- SAP-CRM interface with SAP-PM
- SAP-CRM interface with ECCO
- SAP-CRM interface with CATS
- SAP-CRM interface with GEOBASE
- SAP-CRM Project Management.

The audit assessed the risks and planned controls documented in the Business Blueprint Design distributed on February 18, 2005. Due to the abrupt cancellation of the project during the audit, the SAP-CRM project management objective was not fully addressed. However, an observation relating to general project management and development methodology for computer projects is included in this report.

### Criteria

To measure performance, audit staff used criteria based on Control Objectives for Information and related Technology (CobIT), and the Committee of Sponsoring Organizations of the Treadway Commission (COSO) Internal Control – Integrated Framework.

The IT Governance Institute ([www.itgi.org](http://www.itgi.org)) developed CobiT as an open standard using non-technical language to help focus information technology in support of overall business goals. CobiT was selected as criteria for measurement because it is aimed at addressing business objectives and is easy to understand. CobiT continues to gain acceptance internationally and is evolving due to support from the IT Governance Institute.

The COSO Internal Control – Integrated Framework has been widely adopted as a best practice for documenting business process risks and internal controls for all publicly traded stock companies. This is mainly attributed to the Sarbanes-Oxley Act of 2002 (SOX). This federal legislation was passed in response to corporate scandals such as Enron, WorldCom, Tyco and Global Crossing.

In addition to standards such as CobiT and COSO Internal Control – Integrated Framework, there are other industry based or technology specific standards that can be used to measure an organization's control performance. The Center for Internet Security (CIS) and the SysAdmin, Audit, Network, Security Institute (SANS) both provide guidance on baselines to be used for enhancing control at a more detailed level. The Capability Maturity Model for Software (SW-CMM) could be used to judge the maturity of the software process and to identify key practices that are required to advance the maturity of these processes. Additionally, the Information Technology Infrastructure Library (ITIL) provides a cohesive set of best practices drawn from public and private sectors internationally.

Furthermore, project management criteria could include the Project Management Body of Knowledge (PMBOK) and Projects in Controlled Environments (PRINCE2). PMBOK is a structured method for effective project management that is widely accepted in the United States and endorsed by the Project Management Institute. PRINCE2 provides best-practice guidance on project management and was established by the United Kingdom Office of Government Commerce.

It is important to note in reviewing the results of this audit that City Management has not historically used these or other standards to measure control performance related to service processes.

### **Methodology**

The review was performed in compliance with generally accepted government auditing standards (GAGAS) issued by the U.S. Government Accountability Office and other criteria to conform with the Institute of Internal Auditors' "International Standards for the Professional Practice of Internal Auditing."

GAGAS requires a peer review of auditing practices at least once every three years by reviewers independent of the audit organization. The City Internal Audit Department (CIAD) had its last external peer review in July 2001. CIAD is scheduled for the next peer review in August 2005.

In order to perform the work required, the audit staff used the following techniques:

- Attended SAP-CRM Business Blueprint Design review meetings
- Reviewed preliminary and final draft SAP-CRM Business Blueprint Design documents provided by City ERM management
- Performed inquiries with City ERM, ITSD, SAMHD-Animal Care, Code Compliance, and Public Works SAP-CRM subject matter experts
- Conducted analysis to identify key internal controls encompassed in the final approved SAP-CRM Business Blueprint Design.

### **Conclusion**

It is disappointing that City Council's desire to improve the City's relationship with its citizens will not be fulfilled using SAP-CRM. SAP-CRM is a casualty of the poor post implementation reputation of ERM Waves D, E and H. The difficulties encountered with the prior ERM waves related to user preparedness, payroll pay plans, and delayed financial beginning balance conversions. These are symptoms of project

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management issues identified in the ERM Performance Audit reports released on August 6, 2003 and April 30, 2004 performed by KPMG, external consultants. These reports highlighted the need for the City to improve its computer development project management techniques and recommended the City supplement project controls by incorporating additional project management, quality management and risk management procedures in compliance with the Project Management Body of Knowledge (PMBOK).

A strong project management framework and system development life cycle methodology can minimize the risk of project delays, cost overages, cuts in system functionality, and marginal utilization of deployed functionality. However, they can not completely eliminate these risks. The need for the City to adopt a project management framework and system development life cycle methodology for City-wide computer system development projects has been recognized as an initiative by the Chief Information Officer (CIO) and the newly appointed Director of Information Technology Services Department (ITSD) and Chief Technology Officer (CTO). Internal Audit believes this initiative should be addressed soon because of the number of significant computer system development projects in progress or currently in the early planning stages within City departments.

For example, the systems listed below continue to be planned and developed without the benefit of a consistently applied formal project management framework or system development life cycle methodology:

<u>City Department</u>	<u>System</u>
Fire / EMS	<ul style="list-style-type: none"><li>• EMSPro</li><li>• Building Access and Identification</li></ul>
Police	<ul style="list-style-type: none"><li>• Vehicle Identification Management</li><li>• Automated Vehicle Locator</li></ul>
Aviation	<ul style="list-style-type: none"><li>• Accounts Receivable and Revenue Accounting</li><li>• Noise &amp; Operating Monitoring</li></ul>
Parks & Recreation	<ul style="list-style-type: none"><li>• Golf Course Management</li><li>• Golf Course Point-of-Sale</li></ul>

Internal Audit concurs with ITSD's initiative to identify a formal project management framework and system development life cycle methodology. We recommend this initiative encompass City-wide computer system development projects. Additionally, the adopted system development life cycle should include a deliverable that will emphasize the identification of risks and internal control responses that management will rely upon to help govern the process being automated. This issue is detailed below.

**City-wide System Development Methodology, Project Management Framework and Key Process Risks and Internal Controls Documentation**

**Condition**

A City-wide standard to provide guidance for software development and project management does not exist. In absence of a formal system development methodology and project management framework, the City continues to be susceptible to software development project delays, cost overages, cuts in system functionality, and marginal utilization of deployed functionality.

The SAP-CRM Project Team was utilizing the widely accepted 'AcceleratedSAP' system development methodology (ASAP). ASAP is based on the best practices of SAP customers from around the world and consists of a number of templates, questions, and scenarios that require user input to help determine the best way to implement the R/3 system. However, the ASAP methodology does not include a specific task to identify and document key process risks and internal controls. A critical component of user acceptance is concurrence with the controls design. The more clearly that design is presented (such as in a risk

control matrix), the less likely the control design will be misunderstood and the more likely the controls design will be clearly presented and agreed to by City Management.

### **Criteria**

*CobiT Control Objective Planning & Organization 10.1 – Manage Projects, Project Management Framework* specifies that Management should establish a general project management framework that defines the scope and boundaries of managing projects, as well as the project management methodology to be adopted and applied to each project undertaken. The methodology should cover, at a minimum, the allocation of responsibilities, task breakdown, budgeting of time and resources, milestones, check points, and approvals.

*CobiT Control Objective Planning & Organization 11.5 – Manage Quality, System Development Life Cycle Methodology* specifies that Management should define and implement information technology standards and adopt a system development life cycle methodology governing the process of developing, acquiring, implementing and maintaining computerized information systems and related technology. The chosen system development life cycle methodology should be appropriate for the systems to be developed, acquired, implemented, and maintained.

*CobiT Control Objective Acquisition & Implementation 2.12 - Acquire and Maintain Application Software, Controllability* specifies that the organization's system development life cycle methodology should require that adequate mechanisms for assuring the internal control and security requirements be specified for each information system development or modification project. The methodology should further ensure that information systems are designed to include application controls guaranteeing the accuracy, completeness, timeliness and authorization of inputs, processing, and outputs.

### **Effect**

Strict adherence to a formal system development methodology and project management practices by themselves does not ensure timely completion and successful fulfillment of user requirements for computer system development projects. However, certain minimum deliverables created through compliance with a formal system development methodology and project management framework enhance the possibility of success in development projects.

Furthermore, the lack of key process risks and internal controls documentation can hinder City Management in its fiduciary responsibility to deliver quality services to the public such as the 'Fulfill Citizen Request for Service' process. The monitoring of key internal controls can vary among division managers and its effectiveness will depend greatly on the division managers' monitoring experience and expertise. This can result in undue reliance upon individual heroic efforts versus placing reliance on internal controls embedded in the service process.

### **Cause**

City Management has not taken the necessary steps to formally adopt a system development methodology and project management framework to be applied City-wide for computer system development projects.

Furthermore, City Management has not requested that key process risks and internal controls for City accounting and service processes be documented as part of the system development life cycle methodology.

### **Recommendations**

City Management should formally adopt a system development methodology and project management framework to provide guidance for future computer development projects. City Management should ensure that all computer development projects adhere to these standards or equivalent requirements, regardless of the computer development service provider, whether ITSD, City Department, or third-party software developers.

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Additionally, the adopted system development life cycle methodology should include a task to provide a high level process flowchart and risk controls matrix similar to the COSO Internal Control – Framework model or its equivalent that will clearly identify key process risks and internal controls to mitigate these risks. This documentation will provide City Management a better overall perspective of control effectiveness and can be used as a foundation for continuous key internal control monitoring, testing and improvement.

**Management Response**

The CIO recognizes that the absences of trained project managers, a rational project methodology and a formal project governance structure represent serious risks to the City of San Antonio. The absence of these resources is the single largest indicator of potential project failure.

However, while project management is crucial, it is only one element of the organizational infrastructure required for successful implementations. Effective executive sponsorship, an engaged steering committee and an organizational governance process that connects business needs to project development are all necessary elements of successful projects.

ITSD plans to work with recognized leaders such as the Project Management Institutes and particularly with other local governments who have successfully established project management offices (e.g., Kansas City, MO and Fairfax County, VA).

**Responsible Party for Implementation**

The CIO will continue the development of a Strategic Initiatives section of ITSD that will be responsible for these structures. The development of qualified project management capability for both ITSD and the City organization will be a focus of this group.

**Implementation Date**

ITSD also recognize that the department must work within constraints imposed by what is essentially a maintenance budget for the coming year. However, ITSD does have a starting point as well as the determination to make substantial progress in this area during the next fiscal year.