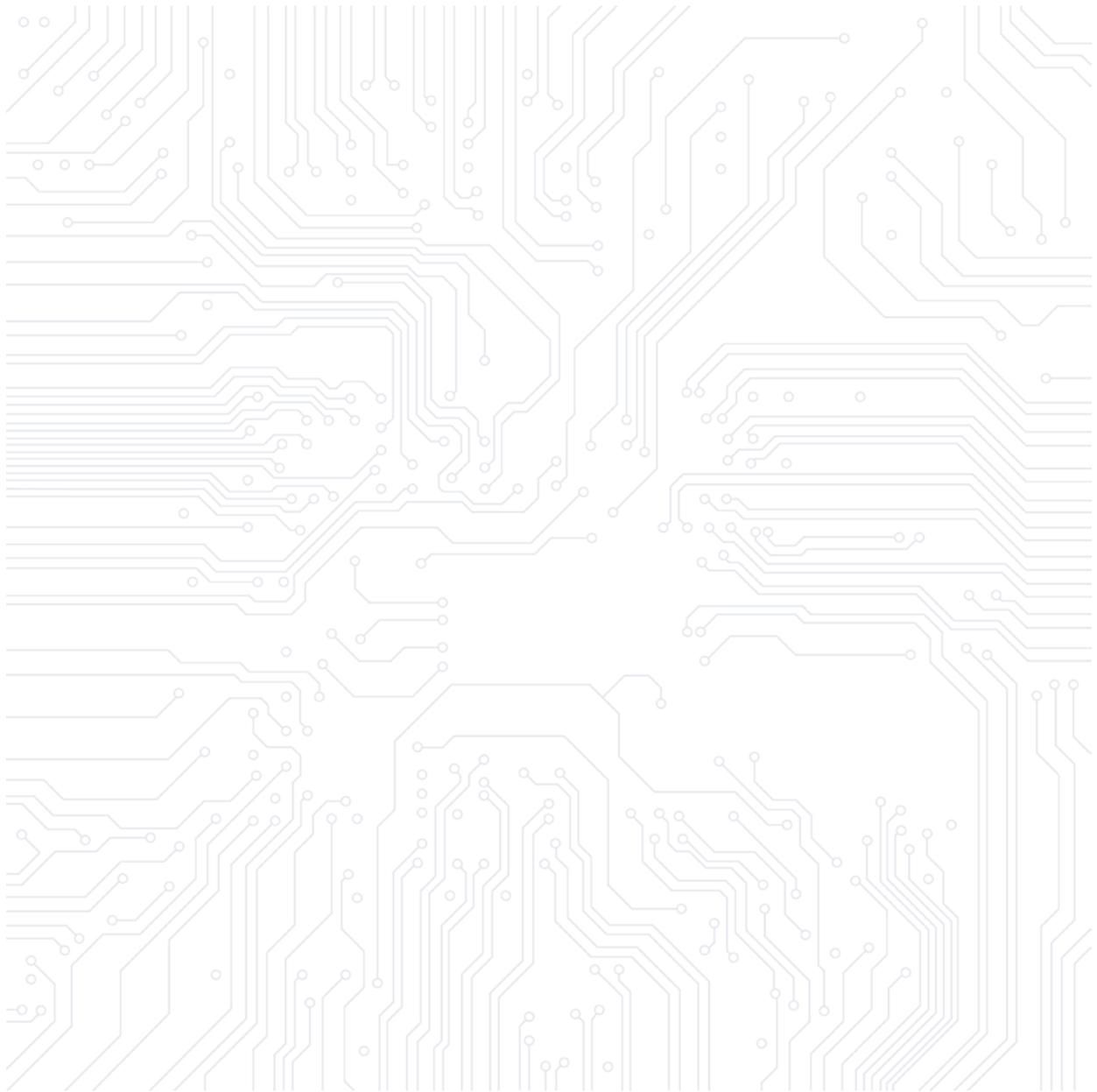


Stanislaus County Information Technology Strategic Plan



March 2017

Preface

Stanislaus County employs a model for information technology governance that could best be described as federalist. There is a central information technology (“IT”) department, Strategic Business Technology which manages certain enterprise systems and practice. Simultaneously there are IT functions in many County departments responsible for some gradient of departmental technology needs. While there have been groups formed at times over the years tasked with a level of oversight for cross-departmental IT practice, strategic planning for information technology in Stanislaus County has not been operationalized on a fixed schedule.

In 2000, an Information Technology Strategic Plan (“ITSP-2000”) was approved by the Board of Supervisors which laid out several key initiatives. In 2007, a follow-up plan, known as the Business Technology Strategy (“BTS”) was approved by the Board, carrying forward some of the key recommendations that had not been fully realized from ITSP-2000, as well as presenting a few new recommendations. These recommendations are provided in the Information Technology Strategic Plan Review section of this document.

The document that you hold in your hands – or, hopefully, that you eschewed printing and are reading in an electronic form – is the first in an on-going series of focused information technology strategic plans. This version of the Stanislaus County Information Technology Strategic Plan (“ITSP-2017”) has three fundamental goals:

Goal One: ITSP-2017 is intended to inform County leadership about the key challenges faced by departments today that are, to some extent, IT-related;

Goal Two: ITSP-2017 is intended to make key recommendations for addressing the challenges identified in Goal One;

Goal Three: ITSP-2017 is intended to put in place a structure for routine reporting on the status of implementation of Goal Two recommendations and for revisiting the challenges and recommendations in future ITSP updates, to occur every 36 months.

To that end, you will find that ITSP-2017 makes use of a structure planned to be incorporated into future ITSP iterations. Challenges are categorized and recommendations are tied to specific challenges. While individual challenges will change over time, the general structure of ITSP planning and reporting is likely to remain consistent. When ITSP-2020 is published, it will include a section describing the implementation of ITSP-2017 recommendations – what worked and what did not. That section (“Information Technology Strategic Plan Review”) in this version of the ITSP is more summary in scope than readers should expect of future versions.

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Executive Briefing

The following is a description of the five primary challenges faced by Stanislaus County for which an IT-based solution may be indicated, or that are directly related to IT service delivery.

For each challenge, the reader will see a brief summary of specific recommendations of this Plan intended to address some component of that challenge. Details of the recommendations are provided in a later section.

In examining the challenges faced by Stanislaus County where technology currently plays a role, or arguably should play a role, it's useful to ask the following 5 questions:

1. How do we best meet the customer where they are – summarized in the IT Innovations mantra of “Online not in line”?
2. How do we select the best products to solve the given challenge or issue?
3. How do we best secure the systems and data we are responsible for?
4. How do we best support the use of County IT systems, whether owned or subscribed?
5. How do we do all of the above in the most efficient way?

From the 5 questions we could potentially construct a mission statement for IT (writ large) in Stanislaus County:

Our mission is to efficiently support the citizens of Stanislaus County by striving to select, secure and support technologies in the service of meeting our customers where they are.

Challenge One: Meeting the customer where they are. “Online not in line.”

Our IT efforts must be focused on creating the best environment to encourage customer self-service. The benefits of allowing the customer to engage directly in government processes electronically are well documented. Not only is an engaged citizenry a compelling goal in and of itself, self-service can cut down on staff time and effort, and minimize errors. Citizens should be able to answer their own questions, to be able to find easily what is required of them, to complete any forms that must be provided, to submit, respond to and follow their issue, request or process to successful completion via our technology solutions. This is as true for our internal customers (County staff), as it is for our external customers (County citizens).

For the foregoing to be successful, Stanislaus County must continue to emphasize the provision of high-quality public-facing services via the Web and on mobile devices. These services must be friendly to use, real-time and responsive.

Additionally, services intended to be used primarily by County staff should embrace mobile and Web-based implementations. Encouraging delivery of services outside of the traditional office environment both creates efficiencies, and provides a more friendly option for meeting the customer where they are.

Key Recommendations in response to Challenge One:

Recommendation 1A: Continue to emphasize Web-based services through the IT Innovations program. The IT Innovation program’s focus on moving services online in support of providing service delivery “Online not in line” should continue. Departments should also incorporate this emphasis wherever possible into their practice, regardless of whether Innovation funds are involved or not.

Recommendation 1B: Seek opportunities to make online services more accessible and usable via mobile devices such as smartphones and tablet computers. This recommendation is described in more detail in the Key Recommendations section.

Challenge Two: Selecting the right product or products

When selecting a product to solve a business challenge, one is confronted with many possible options. It is important to take into account whether a Commercial Off-the-Shelf (“COTS”) solution is the best fit, whether software developed in-house (e.g. by employee Software Developers) or developed by consultants or contractors is the best fit, or if a solution can be crafted utilizing existing platforms such as Microsoft Access or SharePoint or some similar product without the need for, or with a minimal need for custom software development. While this analysis can be a complicated undertaking, it is important to consider each option diligently.

In looking at potential commercial products to meet the business need, the maturity of Cloud-based services has been realized to the extent that such solutions should be included in any investigation.

Key Recommendations in response to Challenge Two:

Recommendation 2A: Cloud services should be considered for most, if not all, future acquisitions of IT systems or services. This recommendation is described in more detail in the Key Recommendations section.

Challenge Three: Securing IT Systems and Data

We have all witnessed the ever-increasing threats facing our IT systems. It is no longer the case that the greatest risks are limited to high-dollar-value targets such as financial institutions. Attackers today are as likely to be motivated by ideology and political views as by financial gain. As the threat landscape has become more complicated, every organization, Stanislaus County included, needs to up increase its efforts in regards IT security.

A rationale often given for why County departments have not fully embraced Cloud services, customer-facing technology solutions and mobility is the fear of increased security risks of such an implementation. From this, we can conclude that improving our security posture will also support our response to other challenges identified here.

In approaching IT security, we focus on threats to the availability of our systems, on protecting the confidentiality of the data, and of ensuring the integrity of the data.

This strategy has several recommendations related to the challenge of securing our IT systems and data. Each is identified in the following contexts: security *at the network edge*, *inside the network*, *related to staff* and *related to policies and practices*. These recommendations are described in more detail in the Key Recommendations section as Recommendations 3A-3M.

Challenge Four: Supporting the use of County IT systems

Once selected and implemented, the IT systems employed in Stanislaus County must be effectively managed. It is not enough to simply continue to manage a given system into perpetuity, however. The County must have plans for managing the full lifecycle of a given IT solution, including determining at which point it is necessary to investigate replacement of that system.

This strategy has several recommendations related to this challenge. These recommendations include investigating alternatives to the current implementations of the Oracle Financial Management System and

PeopleSoft Human Resources Management System (Recommendation 4A), of developing sustainability plans for significant IT expenditures (Recommendation 4B), as well as recommendations related to IT staffing. These may be found in the Key Recommendations section.

Challenge Five: Improving efficiencies in our IT practices

Stanislaus County citizens expect that we strive to be efficient in our practices. Citizens understand that it is not acceptable for us to deliver a service at a high level of quality if it could be conducted to a similar level of quality at a lower cost or using fewer resources. It is important that we consistently emphasize the need to revisit how our practices might be made more efficient.

This strategy has the following recommendations related to this challenge:

Recommendation 5A: Implement a single sign-on solution County-wide

Recommendation 5B: Implement a County-wide email system using Microsoft's Office 365 product

These recommendations are described in more detail in the Key Recommendations section.

Information Technology Strategic Plan Review

As previously described in the Executive Briefing, this Information Technology Strategic Plan (ITSP) is meant to be a document laying out important challenges facing Stanislaus County related to technology, or for which some technological solution should be investigated. IT strategic plans from 2000 and 2007 also made recommendations intended to guide the County’s direction related to technology. Neither document laid out a specific framework for plan review or future plan development, however.

Beginning with this plan, identified here as ITSP-2017, a formal structure is proposed for constant iteration on IT strategic planning for Stanislaus County. In future Plans, this Information Technology Strategic Plan Review section will include an analysis of the implementation of recommendations from previous Plans.

The following table provides a schedule for the publication and review of this Plan, and of the preparation and publication of a future IT Strategic Plan (ITSP-2020):

IT Strategic Plan: 2017	
Publication:	March 2017
First Status Report:	June 2018
Planning Committee convenes:	March 2019
IT Strategic Plan: 2020	
Publication:	March 2020

This review schedule recommends that the ITSP Planning Committee (those involved in crafting the most recently published Plan) meet 15 months after publication of the latest Plan and issue a Status Report on the implementation of that Plan, describing successes and challenges in implementing the Plan’s recommendations.

On the 24-month anniversary of the Plan’s publication, the ITSP Planning Committee responsible for the development of the next Plan (ITSP-2020, in this case) should convene and begin to craft the next IT Strategic Plan, an element of which will be providing a review of the implementation of the previous ITSP. The section you are now reading will be where that information is promulgated.

Who should be involved in these ITSP Planning Committees? Certainly County IT Managers will play a crucial role. Special interest groups involved in certain technologies, such as the IT Security Special Interest Group, and the Oracle/PeopleSoft and GIS management committees must be involved, at least related to their areas of focus. Should Stanislaus County hire a Chief Information Officer, that individual would naturally lead these future planning efforts. In the absence of a Chief Information Officer, the Strategic Business Technology director should continue to lead. Other key stakeholders should be sought, especially when it comes to identifying the challenges reported in the Executive Briefing, around which the Plan is structured.

On the following page, the recommendations from the 2007 Business Technology Strategy (“BTS”) are provided. The 2017 Information Technology Strategic Plan does not contain a formal review of the BTS recommendations, however, some of these recommendations are also referred to individually in other sections of this document.

Business Technology Strategy Recommendations

1. Expand Electronic Access to County Services

Continued migration of service delivery to electronic, especially web-based, methods is inevitable and should be embraced and adopted as a formal goal. Electronic access to services includes access by the citizens of Stanislaus County as well as by county employees and county partners.

2. Manage County IT Activities as a Partnership

County departments have specific needs from IT. The County as a whole benefits from making the best use of IT systems and assets. Wherever practicable the County should attempt to find avenues for improved collaboration in regards IT throughout the County, involving the Departments in key decisions about IT and listening to the needs of customers to manage IT in a prudent, responsible way. To this end, the creation of an IT Steering Committee is recommended to facilitate this communication and collaboration.

3. Establish Standards for Electronic Data Management (EDM)

Stanislaus County, like most organizations, struggles with the number of forms and records required by our business practices. While moving the paper component of these documents to an electronic format is a natural direction, it is important that this be done in an organized, coordinated fashion in order to not simply replace an organized but floor space-hungry paper system with a disorganized but compact electronic one. The development of standards for electronic forms, policies, procedures, guidelines and standards around electronic document management should all be developed to ease this migration to electronic documents.

4. Share and Manage Geographic Information System (GIS) Data

GIS data has quickly become pervasive in the County, as it has in our private lives. The ability to associate data with geographic location is a very effective method of communicating information visually. That data could represent locations of library branches, Megan's Law data or a map projecting impacts on vehicle traffic from proposed road work; in each case the user is better able to assimilate the information visually. While the County has long provided GIS services, in order to improve and expand those services, data standards and data maintenance procedures should be developed to improve the quality of the GIS offering. Additionally, partnering with other local governmental entities to share and improve GIS data could provide benefits for all parties.

5. Implement Business Process Management (BPM)

Ultimately, IT is implemented to improve or extend some business process, or it is probably implemented ineffectively. Understanding the business process first is critical to the success of any business process improvement. It is recommended that a formalized approach be created and adopted for analyzing business processes and evaluating whether an IT-based solution is appropriate to improve those processes. Additionally, mid- to large-scale IT projects would benefit from formalized project management procedures and methods, including standardized reporting and communication protocols. It is recommended that those protocols be developed and used where appropriate.

6. Develop and Sustain IT Capital Investments

Once IT systems are implemented, they must be maintained and there should be some plan for continued operation and ultimately, upgrade or replacement of the system. This includes computer applications such as word

processing and spreadsheet programs, and how their licenses are accounted for and managed, as well as larger enterprise applications such as financial management and human resources systems. Additionally hardware, including desktop computers, portable computers, printers, scanners, file servers, and the various types of network equipment have limited useful lives and forethought should be given to the entire lifecycle of this equipment, including eventual replacement. Planning, including the funding requirements, should be developed in collaboration with County departments for sustaining our IT systems.

7. Move Toward Common County-Wide Data Communication and Network Services

It is recommended that the County look at providing some core IT services either centrally or try to develop a standard platform for common capabilities. In particular, user directories, which are distributed databases used by applications to store information about system users such as user names, passwords and privilege levels, exist in multiple implementations throughout the County. It would be prudent to explore the possibility of tying these diverse systems together. Nearly every County employee has an e-mail account in one system or other, but there have always been challenges in communication between the different systems. It is further recommended that the County explore the feasibility of standardizing on a single e-mail platform. Given the number of IT initiatives already in place, as well as those under consideration, effectively communicating what is being implemented, what stage of delivery it is in currently and specifics about the IT initiative can be a daunting task. However, understanding and communicating what is really happening in IT in the County is critical and it is recommended that an effective method for sharing this information be developed and implemented.

8. Invest in Human and Organizational Capital

It is recommended that the current state of County IT staffing be studied. In particular, classifications should be analyzed to determine if the appropriate number, level and type of IT classifications exists and to recommend improvements where appropriate. Also, given the difficulty in finding and retaining qualified staff with a high level of IT competency, it is recommended that a study be performed to recommend ways of addressing this challenge. Additionally, some thought should be given to IT staffing levels and the distribution of IT staff throughout the County.

9. Develop a Comprehensive Business Continuity Plan

The more dependent we become on IT systems, the more critical it is that those systems remain available a very high percentage of the time. The current Business Continuity/Resumption plan should be reviewed and updated and formal methods of building Business Continuity and Disaster Recovery planning into the business process improvement process should be implemented.

Key Recommendations

1A. Continue to emphasize Web-based services through the IT Innovations program

The IT Innovation focus on moving services online in support of providing service delivery “Online not in line” should continue. Departments should also incorporate this emphasis wherever possible into their practice, regardless of whether Innovation funds are involved or not.

1B. Embrace the use of mobile devices as a key element of the enterprise information technology toolset

Synopsis:

Mobile devices, such as smartphones and tablet computers have become legitimate computers. The best smartphones and tablets are full-featured and supported by the computer industry, and are viable tools for County employees and for citizens to access County services and information. This recommendation suggests several ways to ensure that Stanislaus County is mindfully making the best use of these technologies.

Critical Outcomes:

For this recommendation to become a successful reality, it would be necessary for the following outcomes to be achieved:

- Future major IT expenditures would give preference to products that offer a rich mobile experience;
- Platform lock-in would be avoided through the selection of products that are not tied to a particular vendor’s (e.g. Apple, Google or Microsoft) mobile platform

Additional recommendation specifics

All future IT solutions procured should take into account the possible use of that system on mobile devices. Business cases for future major IT expenditures should give preference to products that offer a rich mobile experience.

Future IT expenditures for products that offer a mobile component should ensure full support for Apple iOS, Microsoft Surface and Google Android devices.

County departments must make sure that their supported mobile devices are kept current in terms of operating system and other security updates.

2A. Cloud services should be considered for most future acquisitions of IT systems or services

Synopsis:

Vendor-hosted solutions delivered over the Internet, referred to in this document as “Cloud” services have become reliable, as secure as traditional on premise solutions, and often highly cost-effective. Stanislaus County should include Cloud-based solutions whenever major IT expenditures are being considered.

Critical Outcomes:

For this recommendation to become a successful reality, it would be necessary for the following outcomes to be achieved:

- Cloud services would be considered for most if not all future acquisition of IT systems or services;
- Reliability of possible Cloud-based services would be a factor in selection;
- Contingencies would be developed for possible future separation from the Cloud service;
- When contracting with Cloud service providers, contracts would be clear in identifying ownership of data;
- County departments involved in contracting for Cloud services would perform their due diligence in investigating the security-related components of the service;

- Business cases for major IT expenditures would diligently identify the true cost differences between both Cloud and more traditional County-hosted solutions;

Additional recommendation specifics

A procurement planning workflow should be developed related to major IT expenditures. Elements of this workflow include a checklist including key considerations when considering Cloud services:

- Reliability metrics;
- Security and privacy measures;
- Procurement vehicles (such as existing agreements with other public sector entities that include necessary “piggy-back” language), and taking into account external mandates, such as Federal requirements prohibiting the use of “local preference” in vendor selection;
- Data ownership stipulations;
- Mechanisms for data export, both for routine data management purposes, and at separation from the vendor or service;
- A business case calculator for identifying cost differences between Cloud and traditional County-hosted solutions

3A-3M. Improve County-wide IT security

Synopsis:

A number of IT security-related recommendations follow. These recommendations are organized into four functional areas: At the Network Edge, On the County Network, Related to Staff and Related to Policies.

Critical Outcomes:

For this recommendation to become a successful reality, it would be necessary for the following outcomes to be achieved:

- An inventory of all County network entry points would be completed, as well as a comprehensive internal IT system catalog;
- IT security audits, both external and internal would become a standing practice;
- Tools for monitoring, reporting on, and resolving security vulnerabilities are required for our success;
- IT Security requires a dedicated, County-wide Cybersecurity Officer (CSO) ; Cybersecurity cannot be managed effectively as an ad-hoc assignment;
- For the CSO to be successful, his or her authority must be County-wide;
- Staff, both IT staff and those in all functional areas, must receive updated IT security training on a regular basis

Additional recommendation specifics

At the network edge:

3A. Inventory all entry points to the County network, Internet connections, and connections to third party networks

3B. Contract with a reputable IT Auditor to conduct a security assessment

3C. Evaluate findings from 3B and implement needed changes as soon as practicable

Inside the network:

3D. Require logging of all inbound and outbound traffic through the entry points identified in 3A as well as alerting of any suspicious activity associated with that traffic

- 3E. Research, procure and implement and require the routine use of internal vulnerability assessment tools*
- 3F. Conduct peer-reviewed internal evaluations of compliance with security policy*
- 3G. Implement a comprehensive internal software catalog*
- 3H. Develop and implement secure software development standards*
- 3I. Research, procure and implement and require the use of a software security assessment tool for all new software developed in-house and for-hire*

Relating to staff:

- 3J. Hire a dedicated Cybersecurity Officer (CSO) with county-wide responsibility and authority*
- 3K. The CSO will develop and conduct mandatory cybersecurity training for all County staff. Staff will be required to attend these trainings every three years. Information Technology staff should be trained more frequently – at least every 24 months*
- 3L. Implement an internal Critical Incident Response Team (CIRT) including the CSO, County Security Officer and Terrorism Liaison Officer who train and practice incident response and have jurisdiction when cybersecurity issues are suspected*

Relating to policies and practices:

- 3M. Update the County IT security policy with elements from these recommendations, acknowledging the authority of the Cybersecurity Officer and CIRT*

Additional recommendation specifics

The foregoing will represent a major change to how IT security is managed in Stanislaus County. Each recommendation above will represent a significant undertaking in and of itself. For each recommendation to be properly scoped, and for costs and impacts to be clearly articulated to all stakeholders, will require someone to dedicate their time and effort. For that reason, *Recommendation 3J is put forth as the most critical next step in Stanislaus County's evolution as a highly secure enterprise.* In the absence of a well-trained, experienced and highly qualified CSO, the other IT security-related recommendations will likely fail, or at least fail to achieve the benefits anticipated.

Existing staff technical expertise in County departments should continue to be leveraged via the Security Special Interest Group, and those individuals may find roles in the internal auditing process (Recommendation 3F) and on the CIRT (Recommendation 3L) depending on the nature of any given incident.

4A Investigate alternatives to the existing management practice for the County's Oracle Financial Management System and PeopleSoft Human Resources Management System

Synopsis:

The County's financial system – Oracle Corporation's Financial Management System ("FMS") and its human resources system - PeopleSoft Human Resource Management System ("PeopleSoft") have been in place since approximately 1999. Many public sector organizations over that period have successfully deployed other products to meet similar needs. Stanislaus County currently pays approximately \$600,000 per year in license, service and support costs to Oracle for these products. Significant IT staff time is likewise tied up in managing and maintaining these systems.

Stanislaus County should conduct a review of alternatives to using the existing FMS and PeopleSoft products, including Cloud service options. If it is determined that FMS and PeopleSoft continue to be the best fit for Stanislaus County in terms of cost and functionality, a review should be conducted to determine if the current arrangement regarding support of these platforms continues to be the best fit for Stanislaus County.

Critical Outcomes:

For this recommendation to be successful, it would be necessary for the following outcomes to be achieved:

- A “blank slate” approach will be necessary if an unbiased review is to be conducted effectively;
- Key stakeholders from throughout the County must be engaged in this process;
- A long-term strategic analysis will be necessary that takes into account current needs as well as probable future requirements;
- Realities of the existing marketplace for these types of solutions will need to be acknowledged in any analysis

Additional recommendation specifics

A survey of alternatives to the existing FMS and PeopleSoft products should be conducted. In particular, products which are in use in other similar public sector entities should be identified.

A cost and fit analysis of the alternatives should be carried out by a team made up of key stakeholders. It will be necessary that users of the existing FMS and PeopleSoft products be invited to participate in this process, as they will be needed to understand how any significant change to County financial management and human resource management would impact their business requirements.

A recommendation should be prepared describing the outcome of this evaluation, and spelling out what changes, if any, should be pursued. This will of necessity be a detailed report taking into account many factors.

In order for the foregoing to be conducted in a timely and thoughtful manner, it is recommended that a lead for this project be identified who has the authority to carry this process through to completion. *It is recommended that a senior manager in either the Auditor-Controller’s Office or in Strategic Business Technology be assigned this leadership role.*

4B. Develop sustainability plans for significant IT expenditures

Synopsis:

In the Business Technology Strategy several objectives were identified related to IT capital investment. Those recommendations are summarized in the Information Technology Strategic Plan Review section. Those recommendations focused on two key elements: creating an inventory of software licenses County-wide, and developing replacement cycles for key IT systems and infrastructure.

Creating an inventory of IT systems is also proposed in Recommendation 3G. This recommendation restates the BTS’s emphasis on the development of standards related to replacement cycles for key IT systems and infrastructure.

Critical Outcomes:

For this recommendation to be successful, it would be necessary for the following outcomes to be achieved:

- County procurement of new IT systems would involve a business case that addresses the lifecycle of the planned system, and of what replacement at the end of that lifecycle would entail;
- Replacement plans for existing IT systems would be developed

Additional recommendation specifics

A number of recommendations in this Plan propose a business case document be prepared when significant IT purchases are being pursued. County IT managers, working with the General Services Agency – Purchasing Division (“GSA – Purchasing”) should develop a model business case document that incorporates these elements, including a planned lifecycle for each product. That business plan document should become an expected element of proposed IT purchases.

Departmental budget documents should reference their identified lifecycle for IT systems and components when pursuing replacement of existing products. A lead will need to be identified in each department who can work with GSA – Purchasing on developing and monitoring their sustainability plans. County departments whose IT needs are provided by Strategic Business Technology (“SBT”) may request that SBT play this role.

Should the County hire a Chief Information Officer, that individual would play a coordinating role in this process.

4C, 4D, 4E: Recommendations related to IT staffing

Synopsis:

In the Business Technology Strategy, several objectives were identified related to IT capital investment. Those recommendations are summarized in the Information Technology Strategic Plan Review section. From those recommendations, there are three issues that are still of primary concern: IT classification structure, IT staff training and certifications, and IT staff recruitment. The recommendations, specifically:

4C: Evaluate the effectiveness of the Stanislaus County IT classification structure

4D: Evaluate strategies for improving the success rate of IT recruitments, especially for the Software Developer class

4E: Evaluate the role that IT technical training and IT certifications could play in building a highly competent IT workforce

Critical Outcomes:

For these recommendations to be successful, it would be necessary for the following outcomes to be achieved:

- A “blank slate” approach will be necessary if an unbiased review is to be conducted effectively;
- Successful practices in similar public sector entities must be taken into account;
- For the Software Developer class, especially at the most senior levels, new approaches will be required

Additional recommendation specifics

Regarding the IT Classification structure

In developing this recommendation, it is not evident that sweeping changes to County IT classifications are necessary. However, in the rapidly changing world of technology, stagnation is the enemy. It has been at least 17

years since a County-wide evaluation of IT classes was conducted. The field evolves quickly, and Stanislaus County must be nimble if we are to continue to attract, retain and promote quality technologists.

Regarding Information Technology Recruitments

It has been the case for decades and will likely continue to be the case in the coming years that attracting talented, skilled technology professionals to work in local government service is especially difficult. Given the proximity of Stanislaus County to Silicon Valley, there is a large pool of candidates with amazing skills upon which we might draw. Unfortunately, these individuals can often demand far higher salaries in the Bay Area than we can afford to pay. And yet, the need for these people exists.

For us to succeed in attracting and retaining quality talent, we must try new approaches. There is a significant need in Stanislaus County for experienced Software Developers, in particular. There is a great deal of competition for these resources, however. Stanislaus County must find ways of either attracting these types of skilled individuals, or else look at ways of providing a leg up to our own staff so that they can attain the necessary skills to serve where they are needed in the County. And, conversely, it may simply not be feasible to employ these types of individuals as County employees. If the latter is true, some strategy related to software development-for-hire must be developed. This is the most critical issue in the arena of IT staffing in Stanislaus County.

Regarding the Role of IT Certifications and Training

Stanislaus County should review how best to make use of computer industry-recognized technical certifications. Most major vendors such as Microsoft, Cisco and Oracle offer certifications in their technology products. Other interest groups have developed certifications that are less specific to a particular vendor, such as the A+ and Network+ certifications. There may be a role for IT certifications among Stanislaus County IT employees in creating a more consistent baseline of skills, and in articulating expectations for staff as they advance in their careers, irrespective of which department that they serve.

Additionally, in keeping with Recommendation 4D, the County should evaluate what is appropriate, prudent and allowable in terms of investing in our own IT staff. It is not sensible to think that an individual hired as a Software Developer I will over the course of their career acquire the necessary skills to eventually promote to a Senior Software Developer/Analyst without some level of formal training or education. Perhaps there is a role for County-sponsored training that can help us “grow our own” technical experts, especially in hard to fill classifications.

These IT staff-related recommendations (Recommendations 4C, 4D, 4E) should be reviewed by County IT Managers in conjunction with Chief Executive Office Human Resources staff. Should the County hire a Chief Information Officer, that individual would lead this effort. In the absence of a Chief Information Officer, the SBT Director will lead.

5A: Implement a single sign-on solution County-wide

Synopsis:

A County-wide single sign-on (“SSO”) solution would allow County employees to access IT services using their existing username and password, as compared to the current arrangement whereby staff may have a different username and password for each system. Not only does having so many different sets of credentials create

confusion among employees, it also negatively impacts IT costs by requiring that Help Desks deal with password resets, and lowers security since employees tend not to observe good password creation and management practices when they are overwhelmed with so many different requirements. The recommended SSO system would also be a necessary component of Recommendation 5B, regarding a County-wide email system.

Critical Outcomes:

For this recommendation to be successful, it would be necessary for the following outcomes to be achieved:

- A master directory containing all County employees would be created and managed at the Strategic Business Technology department;
- Existing Active Directory systems in departments that maintain them would need to be linked to the master directory in order to support updates such as for new hires, assignment changes and password changes;
- Applications which the County wished to integrate would need to be configured to make use of the master directory;
- New IT systems should be evaluated for their potential integration into SSO

Additional recommendation specifics

This implementation will involve every County department which manages their own user directory. Trust among departments and consultants involved in this project will be critical. It is recommended that the existing contract which encompasses the system known as DMS – Directory Management System used by many County departments be amended to encompass that vendor's involvement in this project in order to take advantage of trust relationships already well established.

A master Enterprise Agreement with Microsoft that will cover Office 365 enrollment (see Recommendation 5B) can also incorporate the necessary server and user licenses for the SSO.

There will likely be subsequent phases of a single sign-on implementation, incorporating additional features such as password self-service and multi-factor authentication. These probable next steps should be considered in the initial implementation.

Strategic Business Technology staff at the Manager or Senior Systems Engineer level will lead this effort, in conjunction with the DMS vendor and the Microsoft implementation partner referenced in the next recommendation.

5B: Implement a County-wide email system using Microsoft's Office 365 product

Synopsis:

Stanislaus County currently employs 10 unique email systems, based on various versions of the GroupWise and Microsoft Exchange platforms. Complications arise from having so many different systems, not the least of which is the inefficiencies involved. Implementation of this recommendation would lead to a single hosted email platform which all County staff would use.

Critical Outcomes:

For this recommendation to be successful, it would be necessary for the following outcomes to be achieved:

- All County staff are transitioned to using the Office 365 email product;
- The specific options chosen for Office 365 county-wide ensure that security and compliance are maintained or upgraded relative to the current email implementations;
- Collaboration and mobility features of Office 365 are adopted by all County departments;
- Year One costs of moving to Office 365 would be funded out of County Enterprise IT funding; departments should then incorporate the recurring costs into their budgeting

Additional recommendation specifics

Regarding Budgeting

Office 365 is a Cloud service from Microsoft Corporation with multiple tiers. An advantage of the subscription model employed by Microsoft is that the recurring cost is a fixed monthly/annual expense. It can be transparently budgeted for, and would license all Stanislaus County employees for the most current version of the Microsoft Office product. Microsoft Office is currently used by all departments.

Regarding County-wide email integration

Not only will a move to Office 365 greatly reduce the back-office IT effort of maintaining an email system (see also “Regarding potential cost savings” below), it will connect all email systems together, and make it possible for an employee to be trained once on an email platform and wherever their career takes them as a County employee, they will already be familiar with the email system in use in that department.

Regarding compatibility

Office 365 uses Microsoft Exchange as its email infrastructure and Microsoft Outlook as its email client. These are the most widely deployed email server and email clients in enterprises. The market has chosen these products as the standard, and any products that Stanislaus County might wish to integrate with email, if they can be integrated at all, probably already work with the email system in use in Office 365.

During the transition from existing email systems to Office 365, especially for departments currently on the GroupWise email system, additional tools will be required to migrate email and calendar events, and manage coexistence between GroupWise and Office 365. These products will not be required after all County departments have migrated to Office 365.

Regarding mobility and collaboration

As we increasingly move to a model where work must be done outside of the traditional context of the desk in an office (as previously described in Recommendation 1B), Office 365 is optimized for use on mobile devices. As collaboration between co-workers, teams and between County agencies becomes the expectation, Office 365 is built to enable document sharing and collaborative work.

Regarding the selection of the appropriate Office 365 features

Defining the mix of Microsoft Office 365 features that would be best for Stanislaus County has been the key work of the Office 365 working group. The Office 365 working group met internally, with Microsoft sales staff, and with Microsoft 3rd party integration specialists to understand the myriad licensing options for Office 365. The intent of that process was to define what it would take, at a minimum, to license Office 365 to serve as a true “County-wide email platform.” The group looked at the current state of practice for County departments who manage their own email. Specifically, the group considered what security features, compliance and eDiscovery features, and features related to supporting mobile devices are in use today. The group felt it important that the capabilities already present in existing email systems be accounted for in a possible move to Office 365.

Regarding initial costs

There would be implementation costs including consulting and migration assistance tools. As a component of the Office 365 investigation, the working group was able to take advantage of Microsoft incentive funding of \$60,000 that would be applied to consulting efforts through their partner Catapult Systems to develop a comprehensive implementation plan, and to identify any additional components necessary to successfully bring Office 365 to Stanislaus County.

It is recommended that an overall project manager be assigned to guide this implementation. Given the County-wide coordination required, this task would best be handled by a manager or Senior Systems Engineer at Strategic Business Technology. Time spent on this project management activity would be carefully tracked.

Additionally, for Office 365 to be implemented, it is necessary to have one Active Directory with all Office 365 users contained within it. This could be accomplished via a Single Sign-On implementation (see Recommendation 5A). The Office 365 Working Group has made efforts to identify overlap between Office 365 licensing and Single Sign-On (“SSO”) licenses, and are recommending that an Enterprise Agreement for Office 365 also include the necessary licensing to support SSO, as it will be more cost-effective than making these purchases separately. Catapult Systems and Coneth Solutions, the local DMS provider referenced above will provide the necessary specifics regarding SSO costs as a component of their work.

Regarding potential cost savings

One benefit of entering into an Enterprise Agreement for Office 365 is that all of the products included in the Agreement could be procured at the best available pricing. Microsoft already provides an attractive pricing level for government. Microsoft’s “Level D” pricing provides a 45% discount off of list price for most products to qualifying government agencies. Under the Enterprise Agreement recommended here, the County would qualify for an additional 7% discount on top of that level D pricing. This is the most attractive pricing for Microsoft products currently available.

The Office 365 Working Group has not focused on identifying current costs County-wide that would be eliminated in moving to Office 365. In 2010 an effort was made to identify non-staff costs for maintaining the many email systems in the County. The total identified County-wide cost for email at that time, not including staff time spent on system administration, was approximately \$325,000 per year. Those costs seem to be consistent with current costs. Additionally, an Office 365 enrollment would save Stanislaus County in the following areas:

- Microsoft Office licensing – as all County staff would be licensed at the “User” level, no additional Office licenses would need to be procured. Under Office 365, a single User license can be deployed on multiple devices (e.g. on a desktop and on a laptop).
 - Cost comparison: Purchasing these licenses would need to be done at least every five years in order to support staying current. Assuming an organization-wide purchase every five years, that cost annualized is approximately \$731,000;
- Microsoft Windows licensing -- There are additional enterprise benefits of the Windows 10 Enterprise license that is included in this recommendation. Some departments, regardless of a move to Office 365, are considering enrolling for additional Microsoft Windows license features that are already included in the Office 365 options recommended here.
 - Cost comparison: The value of the Windows 10 Enterprise license, as a 5 year annualized cost is approximately \$370,000 County-wide.
- Storage – Office 365 includes storage of 100 Gigabyte of email per user. It also includes Microsoft OneDrive, which provides for each user an unlimited amount of personal storage, plus SharePoint Online includes 1 Terabyte of storage plus 500 Megabyte per user of shared storage. As departments begin to take advantage of these features, our County-wide need for additional file server storage will certainly be positively impacted.
 - Cost comparison: It is difficult to calculate the monetary value of this component; however current storage costs are approximately \$.004/Megabyte for raw, high performance storage. There are many elements that go into actually providing enterprise storage, but a useful metric is that the cost to provide one Megabyte of storage is in the range of \$.005-\$.01. It should be safe

to assume that the value of this storage is at least \$40,000 and depending on how OneDrive is used and adopted, it could easily amount to \$150,000 or more.

Regarding staff time savings

It is difficult to calculate what savings Stanislaus County might experience regarding technical staff whose time, to one extent or another is spent on tasks related to email system administration. In this Plan we are not recommending that an Office 365 implementation be accompanied by actual IT staff reductions in the County. The savings in staff time should be anticipated to be reallocated to other work that today is either not done as often or as effectively as it should be, or is not being performed at all. This time could be better spent on training non-IT staff, on gaining expertise with County and departmental systems and otherwise becoming involved in making the best use of IT systems that bring value, rather than on back-office maintenance tasks.

Much of the IT staff time savings is anticipated to come from two areas: basic administration of email systems and related (e.g. security, compliance) components, and from responding to security-related problems. While some basic email administration tasks will remain, the care-and-feeding of the systems themselves will be managed by Microsoft's support teams. System upgrades, backups and other *system tasks* will no longer be a primary concern for County IT staff. The work that will remain will be in responding to *user tasks* – setting up new accounts, dealing with name changes, changing job titles, et cetera. Much of this work can be done at a lower technical level, reducing the costs of such efforts. It is certainly not realistic to think that there will be zero security incidents in an Office 365 environment. However, the scale at which Microsoft operates – millions of users, has dictated that they develop, acquire and partner with the best security services available anywhere. It is reasonable to think that the number and severity of email security threats in an Office 365 environment will be significantly diminished, and staff time involved in mitigating those threats will likewise be diminished.

Based on analysis done at Strategic Business Technology, savings of Systems Engineer time in email-related tasks (system tasks and email-security-related efforts) in an Office 365 environment was projected to be approximately 400 hours per year, spread across three Systems Engineers. From that analysis, we project that County-wide IT staff savings could easily be the equivalent of one Systems Engineer, or approximately \$100K per year.

Regarding other benefits of moving to Office 365 County-wide

- Office 365, as licensed here, includes Skype for Business, which allows scheduling of online meetings, shared desktop presentations and Video Conferencing features via Skype;
- It also includes SharePoint, Microsoft's collaboration and document management solution. SharePoint could become a robust and extensible County Intranet, and is used in several departments successfully already. The cost of licensing SharePoint for the entire organization would be approximately \$50,000 per year;
- The Yammer enterprise Instant Messaging platform is also included;
- Integrated Voice Messaging is included, which could eventually prove the successor to the current Voice over Internet Telephony ("VoIP") voice mail system

In summary, this recommendation covers a County-wide adoption of Microsoft's Office 365 platform. A project to move forward with Office 365 would provide the following benefits:

- A County-wide email platform would be achieved, reducing current inefficiencies and allowing improved collaboration;

- The email platform includes a robust bundle of security and compliance features, equivalent to the best that any individual department has managed to assemble on their own, supporting every County employee;
- Cloud storage, in support of email and collaboration features, securely and professionally managed, is also included;
- Licensing for the Microsoft Office suite of products would be included for all County staff, centralizing procurement, ensuring the best available pricing and supporting product replacement after a 5-year useful life of the suite;
- Licensing for the Windows operating system is also included, at the Enterprise level that is most appropriate for the County, at the best available pricing;
- Additional products such as SharePoint and Skype for Business are also included that will likely become standard tools for many departments;
- As Office 365 employs a Software-as-a-Service model, upgrades and new features are included and implemented by the vendor without large upgrade projects or significant downtime;
- All of the products included in this suite are in wide use in government and in the private sector; and the Exchange and Microsoft Office products in particular are de facto standards in their product niche, ensuring compatibility with future efforts.

Some of these components are not in use throughout the County today. For example, GroupWise, rather than Microsoft Exchange, is used for email by many departments. Some departments have deployed Microsoft's SharePoint, many have not. Not all departments have deployed email compliance or mobile device management systems. There are a variety of approaches used by departments to fight email spam, viruses and other security threats, with varying degrees of success. This recommendation would create a baseline for these products across the County that is of the highest level.

Email administration in Stanislaus County is fragmented, and as a result, inefficient. Uniting the County under a single email umbrella, ensuring the best pricing and off-loading much of the day-to-day responsibility of administering a reliable, enterprise-class email offering to an organization who specializes in that service is good business sense. Freeing County IT staff of the need to manage a service that can more effectively be managed by the private sector allows them to focus on the unique needs of their department and the County. This recommendation would create the most efficient mechanism for providing email County-wide.

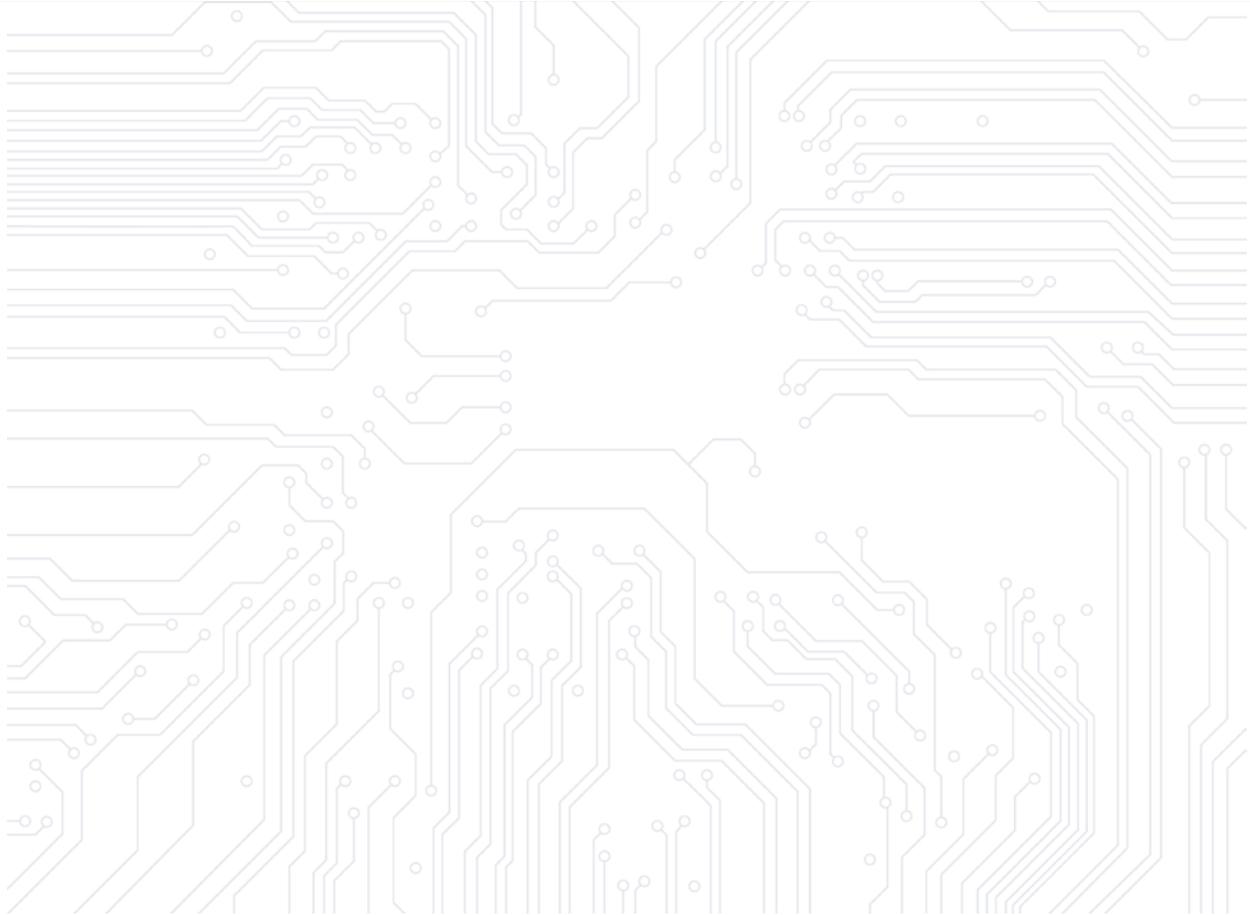
Allowing County employees to make use of a best-of-breed email system that supports mobility and collaboration allows them to be more effective in their actual work. Having a single platform that all County employees use makes new employee training simpler. Having a single email platform makes it less costly for staff to pursue a career with Stanislaus County that might include tenures in multiple County departments, as one of their key business tools will be the same regardless. Having a single email platform makes it easier for technical staff to gain mastery of the email system for the purpose of integrating other systems County-wide. This recommendation would create an environment that supports mobility, collaboration and expertise.

The annual costs of this recommendation are in line with what the County currently pays for email, Microsoft Office and Windows licensing. It provides much more in value, in terms of products and features alone. However, uniting all County employees under one Office 365 umbrella as is recommended here creates a community of County employees, focuses on collaboration and mobility, with an eye toward future needs that far exceeds anything that exists today.

Matrix of Information Technology Strategic Plan 2017 Challenges and Recommendations

Challenge One	Meeting the customer where they are. "Online not in line."
Challenge Two	Selecting the right product or products
Challenge Three	Securing IT Systems and Data
Challenge Four	Supporting the use of County IT systems
Challenge Five	Improving efficiencies in our IT practices
Recommendation 1A	Continue to emphasize Web-based services through the IT Innovations program. The IT Innovation program's focus on moving services online in support of providing service delivery "Online not in line" should continue. Departments should also incorporate this emphasis wherever possible into their practice, regardless of whether Innovation funds are involved or not
Recommendation 1B	Seek opportunities to make online services more accessible and usable via mobile devices such as smartphones and tablet computers
Recommendation 2A	Cloud services should be considered for most, if not all, future acquisitions of IT systems or services
Recommendation 3A	Inventory all entry points to the County network, Internet connections, and connections to third party networks
Recommendation 3B	Contract with a reputable IT Auditor to conduct a security assessment
Recommendation 3C	Evaluate findings from 3B and implement needed changes as soon as practicable
Recommendation 3D	Require logging of all inbound and outbound traffic through the entry points identified in 3A as well as alerting of any suspicious activity associated with that traffic
Recommendation 3E	Research, procure and implement and require the routine use of internal vulnerability assessment tools
Recommendation 3F	Conduct peer-reviewed internal evaluations of compliance with security policy
Recommendation 3G	Implement a comprehensive internal software catalog
Recommendation 3H	Develop and implement secure software development standards
Recommendation 3I	Research, procure and implement and require the use of a software security assessment tool for all new software developed in-house and for-hire
Recommendation 3J	Hire a dedicated Cybersecurity Officer (CSO) with county-wide responsibility and authority
Recommendation 3K	The CSO will develop and conduct mandatory cybersecurity training for all County staff. Staff will be required to attend these trainings every three years. Information Technology staff should be trained more frequently – at least every 24 months
Recommendation 3L	Implement an internal Critical Incident Response Team (CIRT) including the CSO, County Security Officer and Terrorism Liaison Officer who train and practice incident response and have jurisdiction when cybersecurity issues are suspected

Recommendation 3M	Update the County IT security policy with elements from these recommendations, acknowledging the authority of the Cybersecurity Officer and CIRT
Recommendation 4A	Investigate alternatives to the existing management practice for the County's Oracle Financial Management System and PeopleSoft Human Resources Management System
Recommendation 4B	Develop sustainability plans for significant IT expenditures
Recommendation 4C	Evaluate the effectiveness of the Stanislaus County IT classification structure
Recommendation 4D	Evaluate strategies for improving the success rate of IT recruitments, especially for the Software Developer class
Recommendation 4E	Evaluate the role that IT technical training and IT certifications could play in building a highly competent IT workforce
Recommendation 5A	Implement a single sign-on solution County-wide
Recommendation 5B	Implement a County-wide email system using Microsoft's Office 365 product



Acknowledgments

This strategic plan was created in consultation with the following committees, groups and functions:

Information Technology Managers committee;

Geographical Information System Management committee;

Microsoft Office 365 Working Group;

Chief Executive Office

Keith Boggs, Assistant Executive Officer;

Human Resources; specifically Tamara Thomas, HR Director,

Budget team; specifically Patrice Dietrich, Deputy Executive Officer;

Patrick Cavanah, Management Consultant

Auditor-Controller's Office; specifically Lauren Klein, Auditor-Controller and Roger Lovell, Payroll Manager

I would like to thank all who played a part in this process. To all of you and all who will be involved going forward, I would remind you that everything will be OK!

Finally, this work would have been impossible without the support, diligence and supreme professionalism of the employees of the Strategic Business Technology department. It's impossible to give enough credit or thanks for all that you do on behalf of your County. Yours is an impossible task which you manage to find a way to accomplish anyway.

Thank you,

Paul E. Gibson

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1 March 2017

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