Bringing the Future of State IT Into Focus:

A Skills Survey and Gap Report

Created by:
The Information Technology
Managers Academy (ITMA) XIII

June 23 2006

In Support of:
California State Information Technology
Strategic Plan

Table of Contents

Executive Summary

Information Technology Managers Academy (ITMA) XIII is a rigorous training program for current State of California IT managers. The curriculum includes formal classroom training and a major project dealing with an IT policy or management challenge facing the state. The ITMA XIII class project, "Bringing the Future of State IT into Focus: a Skills Survey and Gap Report," lays the groundwork for succession planning at the statewide and departmental levels. ITMA XIII gathered and analyzed currently utilized IT skills by age ranges, and gathered and analyzed projected future skills necessary to run government information systems. The project directly supports Goal 5, Objective 1 of the California State Information Technology Strategic Plan:

> ***"The State will engage in IT Succession Planning to assist in the transition of the State's IT workforce to the future generation of IT leaders. The State will recognize and plan for the replacement of IT employees who will likely leave state service within the next three to five years. This plan will account for the unprecedented number of impending retirements, will focus on increasing diversity, and the increasing skills gap".***

With approximately 40% of the State's aging IT workforce eligible to retire within 3 - 5 years, State of California IT leaders face an unprecedented challenge. They must formulate a strategy to recruit new IT workers, and train younger staff to transition the State's systems to newer technologies. At the same time, they must maintain legacy systems and applications until those systems can be migrated to new platforms. Finally, the accumulated institutional knowledge of retiring workers must be transferred to the incoming workforce.

In order to plan adequately for the impending retirements and attrition of staff within the State, IT leaders require quantitative skills data showing which technical areas require the greatest recruitment and training efforts. This report provides that quantitative data. While this skills gap report is written to identify statewide needs, the data collected for this project may be split into departmental views with minimal effort. It is hoped this data will assist the state CIO, as well as individual department managers, in planning for recruitment and training strategies as a component of their strategic succession planning.

The findings presented here are structured to dovetail with the previous ITMA class project. Each of 158 specific technical skills was categorized into one of 12 functional areas. Each functional area closely follows the curricula developed and presented by ITMA XII. Combining the training curricula with the gap analysis presented in this report should provide a first step toward addressing future recruitment and training efforts.

This report is based on a web-based survey sent to 131 California state departments; high-level IT managers and departmental CIO's from 53 of those departments completed the survey. These managers recorded the current and projected future staffing needs of their departments by allocating each of their staff positions into one or more of the 158 skills listed in the survey. The response rate to the survey was very high; the data returned account for current and projected future skill set requirements for approximately 80% of the overall state IT workforce.

Data Validation: ITMA XIII Survey Results vs. State Personnel Board Data

Before proceeding with detailed analysis of the survey results, ITMA XIII validated their collected data by making high-level comparisons with State Personnel Board (SPB) data.

SPB records indicate that there are currently 8,366 filled IT positions within the following classifications:

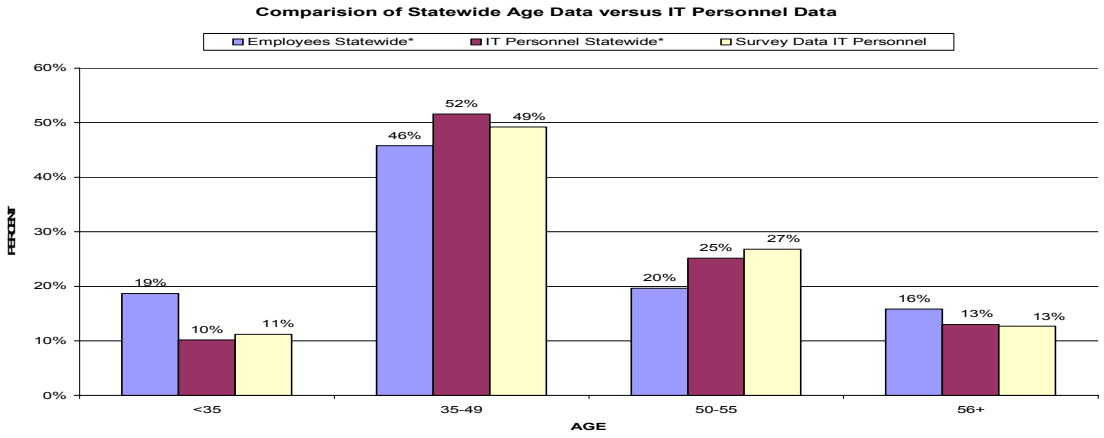
- Data Processing Manager Series

- Information Systems Analyst Series
- Programmer Analyst Series
- System Software Specialist Series
- Information Systems Technician Series
- Computer Operator Series

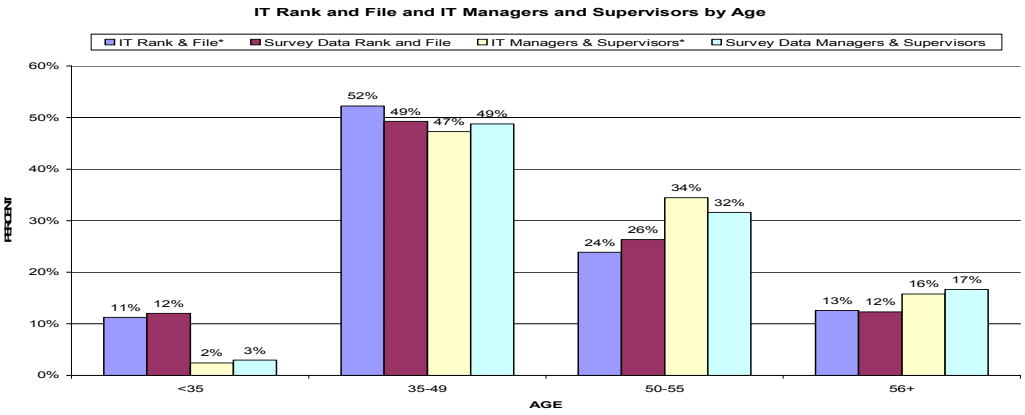
The ITMA XIII survey collected data for 6,538 filled IT positions (personnel years or PY's) in these classifications. These responses provide skills information for approximately 80% of the overall IT workforce in the above classifications. In addition to the filled IT positions, there are 367 vacant positions recorded in the survey.

The chart to below shows the close correlation of state IT worker age ranges between the ITMA survey and SPB records. For example:

* The ITMA survey returns show 13% of the IT workforce is over 55 years of age, matching SPB data for this age range.
* The ITMA survey returns show 27% of the IT workforce is between the ages of 50-55, closely following SPB's 25% figure for this age range.



ITMA XIII performed a second check to validate the survey results by comparing age breakdowns within the managerial and supervisory classifications. These figures also track SPB records very closely, as shown below.



By validating the survey results with known-good data from SPB, ITMA XIII gained confidence that their

collected skills data is accurate, and proceeded with their gap analysis by functional area and individual technical skills. The following tables and charts provide highlights of the findings contained within this report.

Results by Functional Area

Based on collected survey data, departments within the State of California have identified approximately 1166 employees will leave state service due to attrition or transfers over the next 4 years. This loss of personnel amounts to 17% of the current state IT workforce accounted for within the survey and is much less than the 40% percent eligible to retire based upon age. In this section, the survey results are broken down into broad functional areas, each containing different but related technical skills. For a list of skills within functional areas, see Appendix III within the full report.

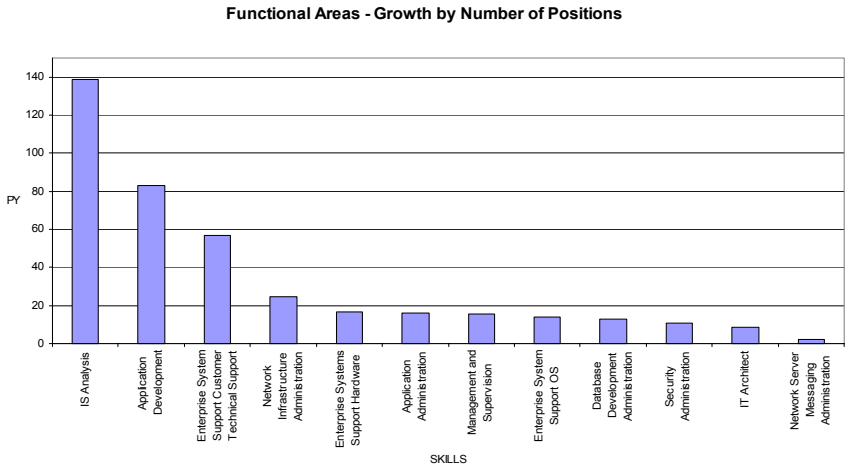
This chart indicates "Projected Percent Gap" for each functional area, based on the responses to the statewide survey. Current and future staffing needs, as well as projected attrition, are used to calculate gap over the next 4 years. Because the survey is a representative sample of all state IT workers, the percentage gap, rather than the actual number of positions, should be used to draw conclusions. For example, it is anticipated that, unless immediate measures are taken to recruit and train, there will be a shortfall of one in five workers (19%) within the Security Administration functional area in the next 4 years.

Projected Gap by Functional Area

Functional Area	Anticipated PYs	Projected Gap	Projected Percent Gap
Application Administration	687	-113	**-16%**
Application Development	1,222	-354	**-29%**
Database Development/Administration	384	-79	**-21%**
Enterprise System Support – Hardware	404	-102	**-25%**
Enterprise System Support - Operating Systems	307	-70	**-23%**
Enterprise System Support - Customer Technical Support	980	-238	**-24%**
Enterprise System Support - Network/Server/Messaging Administration	399	-46	**-12%**
Information Systems (IS) Analysis	1,410	-424	**-30%**
IT Architect	131	-49	**-37%**
Management/Supervision	643	-184	**-29%**
Network Infrastructure Administration	415	-104	**-25%**
Security Administration	188	-37	**-19%**

The overall skills gap facing every IT discipline in the state varies from 12% - 37%. In the Information Technology Architecture area, given the projects and systems that the state must support over the next four years, the gap that must be filled through recruitment and training efforts in this field is projected to be 37%. Individual skills necessary within this functional area, along with the number of positions required for each skill, can be reviewed on the statewide and departmental levels by examining the survey data.

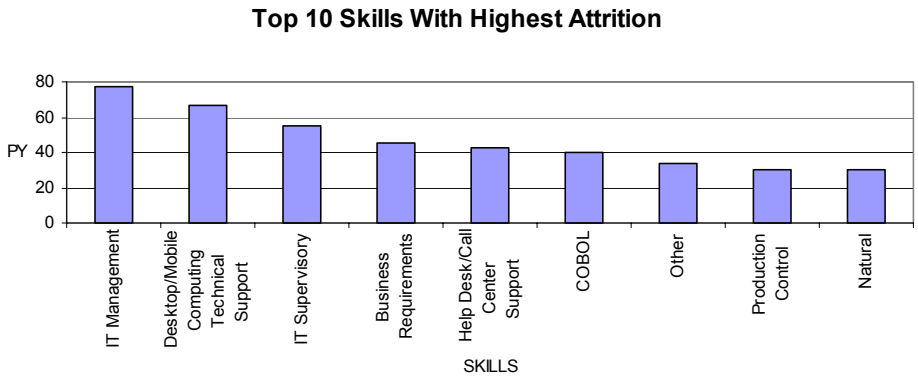
The chart to the right indicates growth by functional area. The area of highest anticipated growth is IS Analysis, estimated to grow by approximately 140 PY's. This estimate is based on the skills identified in the survey and the PY's associated with these skills. Because surveyed skills could be allocated in increments smaller than a single PY, there is the potential for the actual number of PY's needed to be higher.



Results by Skill Sets

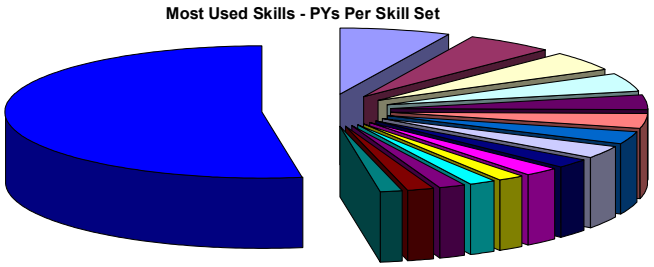
Each of the 12 functional areas above is composted of related skills. After reviewing these functional areas, it is useful to look deeper into the specific skills that present the greatest succession planning challenges over the next four years.

This chart shows the skill sets with the highest levels of anticipated attrition over the next 4 years. It must be emphasized that skills were reported in increments of a PY (full-time position). For this reason, the total number of PY's actually required could potentially be higher. These skills require particular focus in the succession planning and recruitment efforts.



Most Used Skill Sets

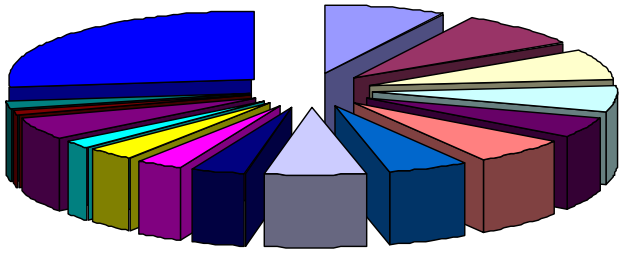
48% of the total PY's surveyed work within just 15 skill areas. To put this in perspective, consider that 158 skills were surveyed, but about half of all state IT workers specialize in just 9% of those skills. The top fifteen skill sets are presented here in the order of the highest to the lowest based on numbers of PY's in that skill set.



SKILL SET	PY's	% of All PY's
Desktop/Mobile Computer	474	6.9%
IT Management	379	5.5%
IT Supervisory	330	4.8%
Helpdesk/Call Center	305	4.4%
Cobol	258	3.7%
Business Requirements	246	3.6%
Testing	218	3.1%
IT Project Management	206	3.0%
Natural	157	2.3%
Production Control	143	2.1%
"Other"- Info Sys Analysis	121	1.8%
IT Procurement	114	1.7%
"Other"- Application Dev	112	1.6%
Windows	111	1.6%
Windows/Novel/PC Server	106	1.5%
Totals	3280	47.6%
Remaining 144 Skills Combined	3625	52.4%
Total Statewide, including vacancies	6905	
Percent of top fifteen		48%

It is important to note that these top fifteen skill sets also account for approximately 73% of the total gap forecasted:

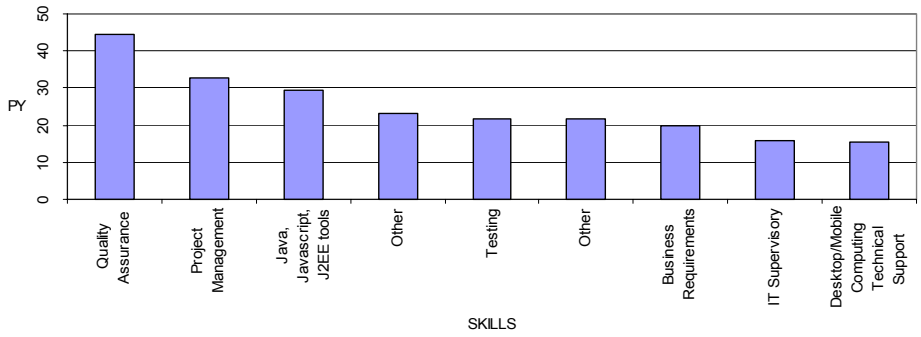
Most Used Skills - GAP per Skill Set



SKILL SET	GAP	% of GAP
Desktop/Mobile Computer	93	8.0%
IT Management	98	8.4%
IT Supervisory	85	7.3%
Helpdesk/Call Center	72	6.1%
Cobol	56	4.8%
Business Requirements	76	6.5%
Testing	60	5.1%
IT Project Management	80	6.8%
Natural	42	3.6%
Production Control	34	2.9%
"Other"- Info Sys Analysis	36	3.1%
IT Procurement	21	1.8%
"Other"- Application Dev	62	5.3%
Windows	14	1.2%
Windows/Novel/PC Server	23	2.0%
Totals	852	72.9%
Remaining 144 Skills Combined	314	26.9%
Total Statewide, including vacancies	1166	
Percent of top fifteen		73%

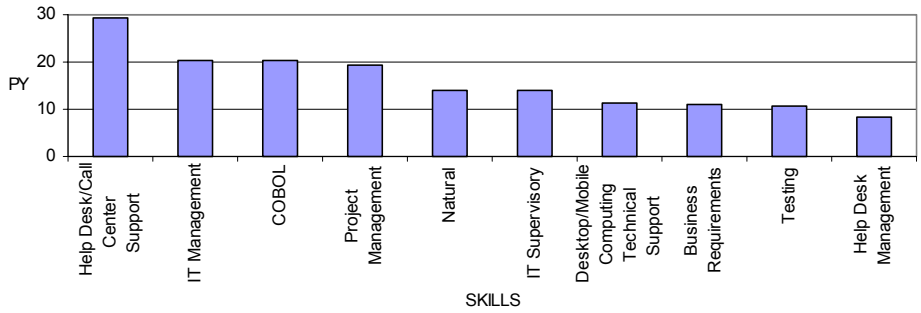
The chart below shows the skill sets in which the number of future anticipated staff is higher than the number of staff currently in place, indicating a growth trend. The inclusion of Quality Assurance, Project Management, Testing, and Business Requirements supports the increase in awareness of the need to improve the quality of products and services being produced for our customers.

Greatest Growth by Skill Set

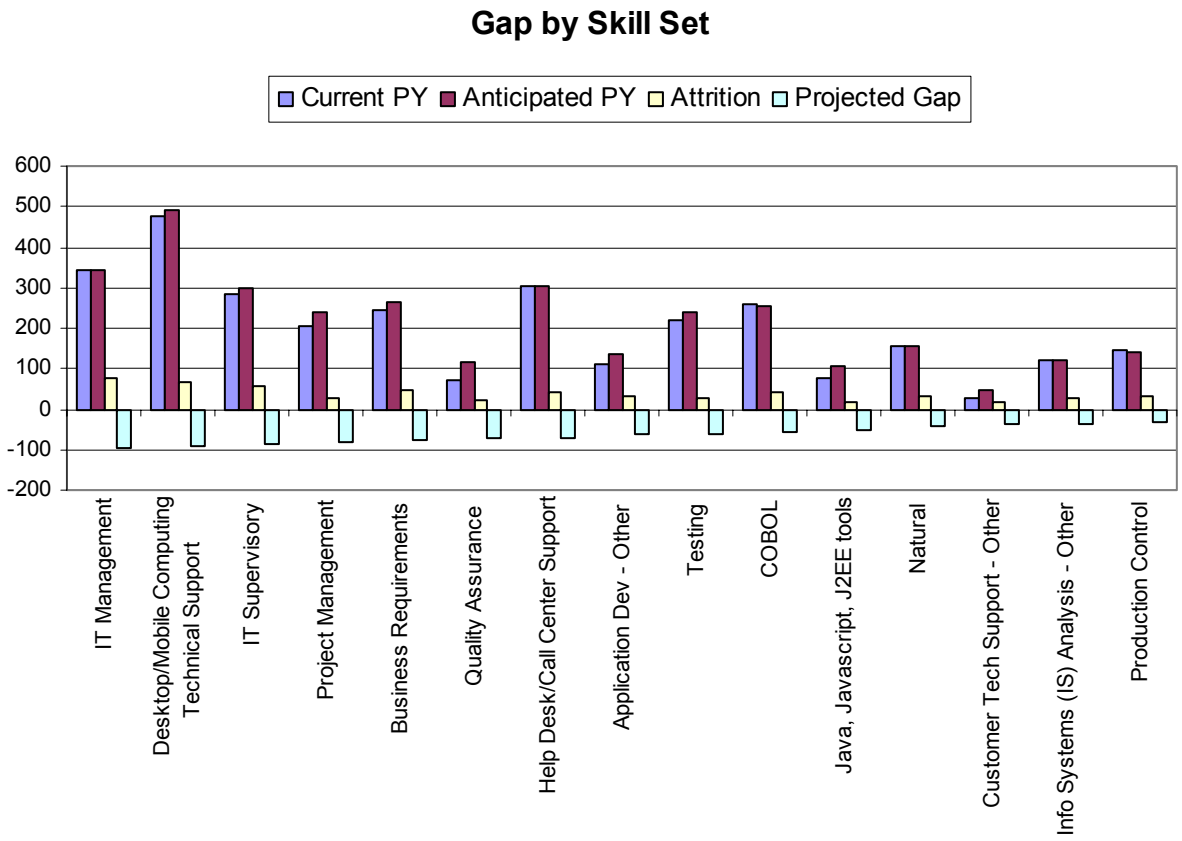


The chart below shows current vacancy levels by skill set, indicating areas where immediate recruitment efforts are needed.

Highest Current Vacancy by Skill Set



The chart below clearly shows the areas in which over the next four years, the State of California will have the greatest need. There are four skill sets included in this chart which indicates an increase in awareness for the need to improve the quality of products and services being produced for our customers (project management, business requirements, quality assurance and testing). Each of these also shows a growth in staffing over the next four years.



Summary

The data presented in this report provide a detailed quantitative view into the State of California's current IT workforce, along with projections of future staffing needs. While a complete succession plan for the State was outside the scope of this effort, it is hoped that the details presented here are used by the State CIO and department managers in their succession planning efforts.

At a high level, analysis of current staffing and future needs within the functional areas point to general trends in the programming, management, and other IT areas. Within each of these functional areas, 158 specific skills and their projected gaps are identified at the statewide level as those most critical to consider in succession planning. Each participating Department will receive their specific data so IT Managers can formulate specific training and recruitment efforts for their departments. Appendices I and IV within the full report provide suggestions to aid in succession planning.

Introduction

California's Challenges

California state government delivers a broad array of services to the most diverse population in the United States. Managers face increasing challenges as they recruit new staff, strive to retain current employees, and plan for staff attrition through retirements. Past budget shortfalls, hiring freezes, staffing reductions, and limited training opportunities have left the State of California unprepared for the impending mass retirement of highly skilled IT technical, professional, supervisory, and management personnel.

As state IT professionals, we work in a time of unprecedented challenge. The demand for our services continues to grow, customer expectations continue to grow, and yet our human resources are leaving at an unprecedented rate. The state's 208,000-person labor force, of which 8000 are Information Technology (IT) professionals, is growing older:

- 70,000 state workers are eligible to retire within the next five years.
- 68% of the state work force is at least 40 years old.
- 60% of all state managers are at least 50 years old.

To address the unprecedented number of staff leaving IT positions in the next 2 - 4 years, the Information Technology Managers Academy (ITMA) XIII conducted the first comprehensive statewide skills gap assessment, and produced a statewide skills gap analysis report. This report and its associated data, collected from high-level state IT managers, provide a tool which can be used to plan for future recruitment efforts both at the statewide and departmental levels.

ITMA XIII structured this report and its source data to support the functional areas and training curricula defined by the previous ITMA XII class in its statewide training project.

Meeting the Challenges

To meet these challenges, State IT Managers must begin the succession planning process. Succession planning is not a one-time event, but a continual process. One of the first things State IT Managers must understand is the current workforce, its strengths, weaknesses, and gaps in skills. The results from this statewide survey will produce a skills gap report. The report provides a statewide view that identifies trends in skills, technologies, and vacancies. It provides solid data that allows managers to effect changes in organizational direction and priorities.

The ITMA XIII class is making this IT succession planning survey tool available to California's IT leaders to use in the years to come. If we don't plan ahead and continually forecast our needs 2 - 4 years down the road, we leave the state vulnerable to a crippling shortage of skilled information technology employees. Such a shortage could result in significant monetary loss due to system errors and outages, lost business opportunities, an inability to "modernize" as new technologies emerge, and no staff to fulfill mandated commitments to deliver services to the citizens of California.

What is the Information Technology Managers Academy?

The Information Technology Academy was initiated in January 1990 as a competitive program to train state IT managers for future high level management and executive IT positions. Candidates must submit an application, an essay, and be recommended by a high level executive to qualify for acceptance into the 26-person class. ITMA's year-long curriculum includes formal classroom training in collaborative skills, presentations, business writing, change management, and political skills. In addition, the class completes a major IT management-related project of its choosing. This Skills Survey and Gap Report

represents ITMA XIII's project. It is ITMA XIII class members' hope that this tool will aid state IT managers in planning for future staffing needs.

State Strategic Plan

Goal 5 of the California State Information Technology Strategic Plan states:

> **"The State will strengthen its information technology workforce to meet the needs and challenges of supporting a large and complex public-sector organization in the 21st century."**

Goal 5, Objective 1 – "Succession Planning," states:

> **"The State will engage in IT Succession Planning to assist in the transition of the State's IT workforce to the future generation of IT leaders. The State will recognize and plan for the replacement of IT employees who will likely leave state service within the next three to five years. This plan will account for the unprecedented number of impending retirements, will focus on increasing diversity, and the increasing skills gap".**

This project directly supports the above goal through the collection and analysis of current and future predicted workforce skills throughout the state's IT organizations. It lays the groundwork for a comprehensive statewide succession plan, and gives department managers a quantitative view of their organizations' needs during the coming 2 - 4 years.

Defining "Gap"

ITMA XIII reviewed many succession and workforce planning models, spanning the Federal Government, States, departments within the State of California, and the private sector. To implement each of these models, organization management must begin with an understanding of the following:

- Skills required to support today's functions.
- Upcoming projects and their general staffing needs.
- Anticipated attrition due to transfers, retirements, etc.

After gathering this data, it is possible to calculate the "gap" between current staffing needs and predicted needs in the future. Gap may be calculated to include a specific skill set, such as "Pascal Programming", or to a broad functional area, such as "Network Infrastructure Administration." The 12 functional areas in the report closely correspond to the previous ITMA class project, which developed training curricula for several IT areas. Combining ITMA XII's report with this gap data should allow state managers to formulate a workforce succession, recruitment, and training plan that allow their organizations to continue to succeed.

The Gap Formula

ITMA XIII used a gap formula that identifies the difference between supply and demand for civil service staff in the IT classifications over the next four years. Survey participants were asked to identify their current IT workforce by age groups and skill sets, as well as their projected future needs. ITMA XIII then calculated the gap in the skill, as well as in the overall functional area. This gap analysis provides IT leaders with information critical for planning and budgeting.

Methodologies

Managers recorded the functions of their departments by allocating each of their staff positions into one or more of the 158 skills listed in the survey. Analysis of the data from the survey identified those skills deemed at risk due to retirement and attrition within the California State Government IT workforce.

Survey Delivery Method

To maximize flexibility and ease of use, ITMA XIII delivered the surveys via a Web-based application. The online survey allowed the class to collect a large amount of data quickly and economically. Furthermore, respondents could start and stop the survey at any time. In addition to the web-based survey, ITMA XIII produced a PDF document containing the survey content online for IT executives to print and reference as they gathered necessary information to complete the online survey with their agency-specific answers.

Target Population

The target population was clearly defined as the IT workforce in the California State organization. Survey respondents included each state organization's IT executives and managers. ITMA XIII captured contact information for the respondent, as well as that of the IT Executive for each department surveyed. The class recommended strongly that large departments, or departments with decentralized IT operations, designate a coordinator to compile all departmental responses, and then submit the comprehensive results for the entire organization.

Survey Development

Survey content was developed from several sources. As a framework for skill sets and technology grouping, ITMA XIII members used the previous-year IT Academy's high-level core competencies, which are listed in Appendix II, as a framework. ITMA XIII meshed this gap report with the previously-developed competencies list and course curricula, to enable state IT managers to draw meaningful conclusions about their staffing needs and to solve these needs according to the existing State Strategic Plan.

To compensate for technological shifts, ITMA XIII occasionally narrowed or changed the component skill sets comprising the core competencies defined by the previous ITMA class. For example, skills required in support of the "Web/Internet Development" competency were rolled into the "Application Software/Web Development" portion of the ITMA XIII survey. This change recognizes the convergence of Internet programming tools with other application development environments.

Another resource utilized was the Pre-Survey Interview with various State of California IT Executives. ITMA XIII reached out to the highest level of the state IT community to get feedback on the proposed survey to promote survey participation.

Many aspects of the survey and analysis were leveraged from other organizations that had previously performed similar studies in the context of larger succession planning efforts. Some of these entities include the State of New York, State of Massachusetts, State of Wisconsin, and the California Employment Development Department. By reviewing similar projects, ITMA XIII could learn best practices and avoid pitfalls in developing a comprehensive skills survey.

Finally, based on ITMA XIII members' knowledge, experience, and exposure to workforce planning, several brainstorming sessions identified specific technologies and skills, and grouped them under the appropriate category. These individual skills are listed at a more detailed level than previously outlined. For example, several different database types and programming languages are surveyed in the application and database development categories.

Survey Content

The web-based survey collected comprehensive information on 158 discreet skills, ranging from programming languages, to technical contract management, to server support. These skills were arranged into core competencies, which could be easily selected or skipped depending upon their relevance to each survey respondent. This layout allowed respondents to quickly fill out their information without being overwhelmed by the number of data items collected. The survey was made available on April 3, 2006. To view a copy of the survey, please refer to DTSTC/ITMA website http://www.dts.ca.gov/Training/itma_previous.asp?key=2013.

A Word about Survey Statistics

The diverse nature of state agencies makes sample-based statistical analysis of survey results difficult. Large variations in agency size and project focus result in an overall survey dataset that cannot be considered statistically normal. For example, if one attempts to draw statistically valid conclusions about current and future statewide need for a specific programming tool, results may be skewed due to large sample representation of one large agency, at the expense of smaller departments. This analysis would also require the assumption of data normality within the sample set, which cannot be shown with any degree of confidence. The ITMA team believes that such analytical techniques should be used with caution.

ITMA XIII made the decision to include both Personnel Year (PY) trends and workforce percentage trends in the Gap Analysis Report. This decision was made to highlight two different types of high-risk scenarios. In the first scenario, a shortage of large numbers of PY's with required skills used by many departments indicates a serious challenge to succession planning. In such cases, percentages are an accurate method of representing skills gaps. In the second scenario, several skill areas contain a very small number of PY's. In some cases, there are fewer than 5 PY's in the state practicing a given skill, making percentage gap calculations less important than actual PY figures. While there is also significant risk to the state in this second case, the challenge of filling a very small number of PY's is much smaller than the challenges presented in the first scenario.

QA Survey

Before developing the main survey, ITMA XIII conducted a smaller quality assurance survey of high-level management at ITMA XIII members' agencies and of the ITMA XIII class managers. The major purpose of this survey was to do a "reality check" on the proposed process for the main survey, and to gauge its relevance in the context of applicability to departmental planning and to the state's strategic direction. The QA survey also gave ITMA XIII valuable feedback on the clarity of survey instructions.

In general, management was supportive of the project, and on average committed to allocating approximately two working days of staff time to gather departmental data and to fill out the main survey. Approximately two thirds of pilot survey respondents indicated that their departments did not maintain a skills inventory of their IT staff. Three quarters of those surveyed found value in seeing a gap analysis of state skills data.

Several managers were interested in a more comprehensive report that included a complete workforce succession plan for the state. After much internal debate, due to time constraints and applicability of state wide data to individual departments, the ITMA class members kept the narrower scope of a gap analysis only.

Other Staff Resources

It is important to note that the information collected regarding students, retired annuitants, contractors, and other temporary staff (Other Staff Resources) was not used when calculating the Skills Gap. Readers must recognize that departments make use of these types of staffing resources in order to meet their mission, vision and organizational goals, as well as complete project work, and that not asking departments to document this information would not accurately portray current and future staffing needs. However, it would be misleading to include these staffers in the Skills Gap analysis. In the future, analysis should to be done to look at the underlying reasons these types of staffing are used and needed.

Assumptions

In collecting and analyzing the data presented in this report, ITMA XIII made several assumptions about the positions reported, and the accuracy of the position counts returned:

- Positions that are vacant or become vacant through attrition will not be refilled.
- The attrition estimated by department supervisors will occur as predicted.
- The data entered by departments into the survey and used for reporting is accurate.

Report Findings

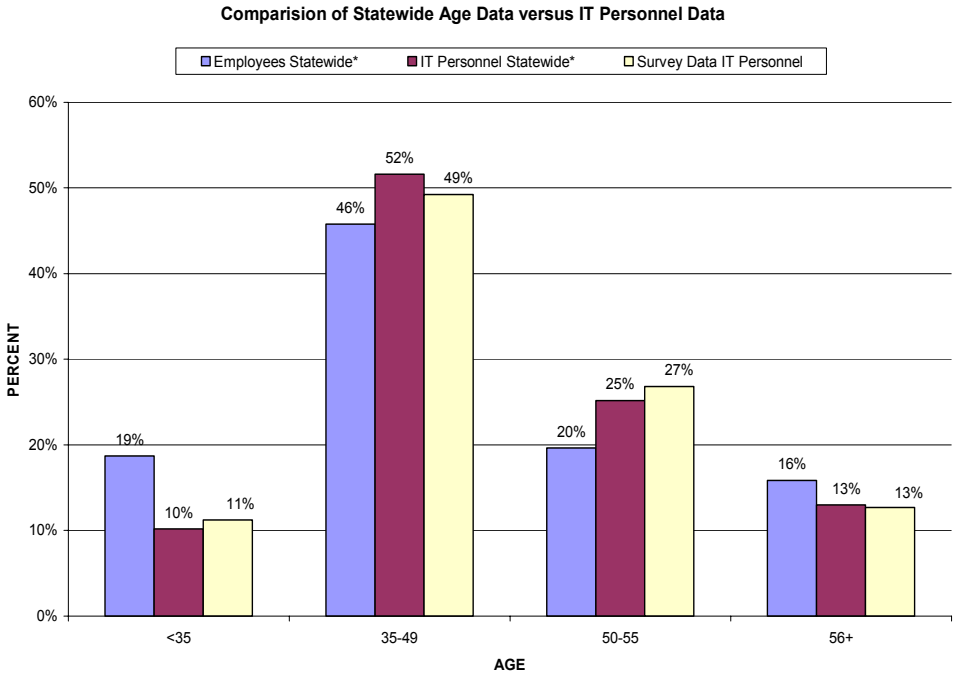
Comparison of ITMA XIII Survey data to State Personnel Board (SPB) data

Current workforce in the major State of California IT classes numbers 8366, as reported by State Personnel Board (SPB). IT classes include:

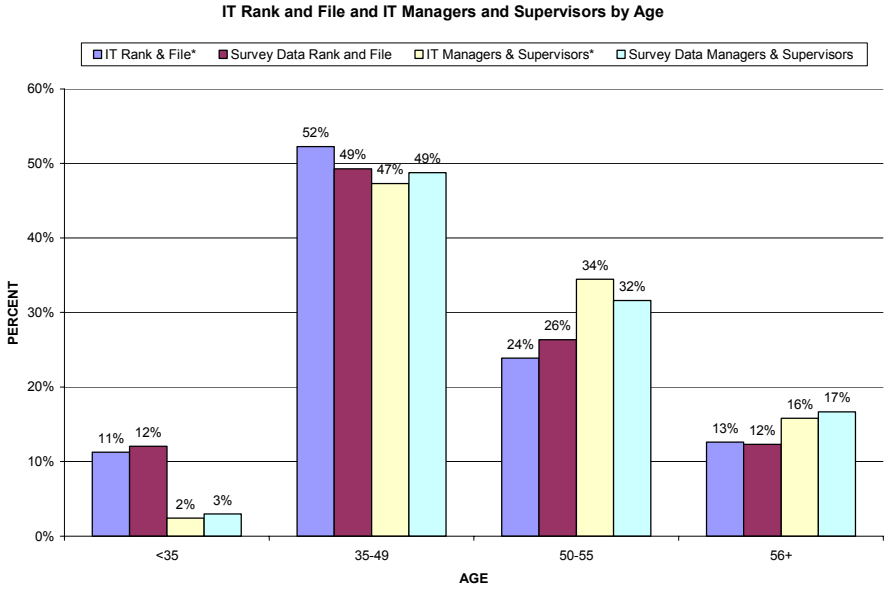
- Data Processing Manager Series
- Information Systems Analyst Series
- Programmer Analyst Series
- System Software Specialist Series
- Information Systems Technician Series
- Computer Operator Series

The number of filled IT positions identified in the ITMA XIII survey is 6,538, which represents approximately 80% of the IT workforce identified by SPB. In addition to filled IT positions, there are 367 vacant positions identified. As indicated by the survey, it is anticipated that over the next 4 years, departments within the State of California will be losing 1,166 state employees due to attrition or transfers among Departments. This loss of personnel amounts to 17% of the current state IT workforce accounted for within the survey and is much less than the 40% percent eligible to retire based upon age. For the same period of time, the data from the survey indicates that an additional 267 positions will be added to support California's IT systems. Extrapolating this to the State IT workforce as a whole, approximately 312 new IT positions must be added over the next 4 years to accommodate existing and future IT systems. Accounting for both attrition and growth, it is anticipated that there will be a future gap of 1,478 in California's IT workforce.

In the chart below, survey data gathered by ITMA XIII is checked against SPB employees counts in the IT and overall state employment classes. According to the data collected from the survey, 13% of the IT workforce is over 55 years of age, and 27% are between the ages of 50 and 55. These numbers closely follow SPB data showing 13% of the IT workforce is over 55 and 25% are between the ages of 50 and 55. Comparing the surveyed percentage of the IT workforce over 50 years of age to the state workforce as a whole indicates that the number of the IT workforce in this range is slightly higher (40%) than that of overall state workforce (36%).



The survey data also mirrors the data obtained from the State Personnel Board when comparing Rank and File employees with Managers and Supervisors. Overall, the percentage of IT Managers and Supervisors over 55 years of age is 16%, while 12% of rank and file workers are over 55. Similarly, 32% of supervisors and managers are between 50 and 55 years of age, while 26% of IT rank and file workers fall into this range.



According to both SPB and the survey data, less than 13% of the current state IT rank and file workforce is under 35 years old, indicating that the State has issues with recruiting new, younger staff into the IT workforce.

Functional Area Data

Defining Functional Areas

The previous Information Technology Managers Academy, ITMA XII, developed an extensive training curriculum and course catalog aimed at developing the State's IT workforce. ITMA XII developed a set of functional areas to encapsulate the State's IT needs as it continues to develop, maintain, and operate IT systems. As noted in the "Methodologies" section, some of these functional areas were consolidated (i.e. "Web/Internet Development" and "Application Development"). In addition, ITMA XIII assigned 158 technical skills within the functional areas, giving each area a more concrete definition. The functional areas are listed below, with a summary of gap results for each area.

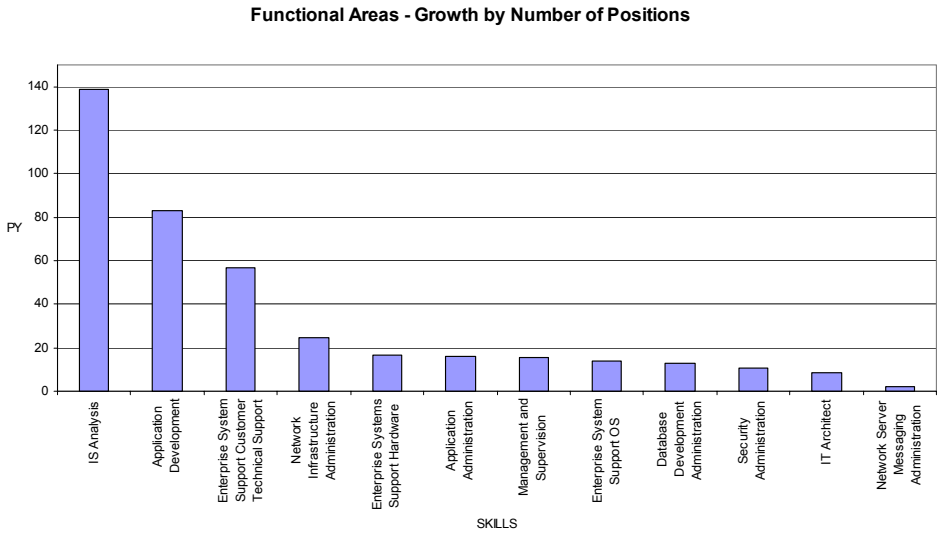
The chart to the right indicates "Projected Percent Gap" for each of the functional areas, based on the responses to the statewide survey. This chart takes into consideration current and future staffing, as well as anticipated attrition. Because the survey is a large but incomplete sample of state IT workers, the *percentage* gaps, rather than the actual numbers of positions, are used to draw conclusions. Though larger departments with many employees affect these statistics with heavier weight than small departments, it is clear that the overall skills gap facing every IT discipline in the state varies from 12% - 37%. For example, given the projects and systems that the state must support over the next four years, the number of employees working in the Information Technology Architecture field will fall short of the state's needs by 37% in the absence of intense recruiting and training efforts.

Projected Gap by Functional Area

Functional Area	Anticipated PYs	Projected Gap	Projected Percent Gap
Application Administration	687	-113	**-16%**
Application Development	1,222	-354	**-29%**
Database Development/Administration	384	-79	**-21%**
Enterprise System Support - Hardware	404	-102	**-25%**
Enterprise System Support - Operating Systems	307	-70	**-23%**
Enterprise System Support - Customer Technical Support	980	-238	**-24%**
Enterprise System Support - Network/Server/Messaging Administration	399	-46	**-12%**
Information Systems (IS) Analysis	1,410	-424	**-30%**
IT Architect	131	-49	**-37%**
Management/Supervision	643	-184	**-29%**
Network Infrastructure Administration	415	-104	**-25%**
Security Administration	188	-37	**-19%**

Functional Area Trends

The chart to the right shows the growth of each Functional Area used in the survey. This chart does not take attrition into account, but focuses on current vs. future State IT positions. The survey data indicates that there will be growth in every functional area.

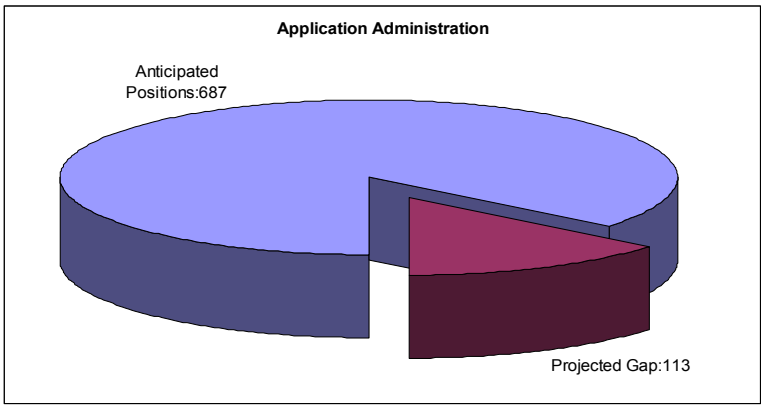


The following pages provide a brief summary highlighting each functional area's projected gap.

Application Administration

Within the Application Administration functional area, there will be a gap of approximately 16% over the next four years. Specific skills most in demand within this functional area are anticipated to include:

- Customer Relationship Management (CRM) administrators
- Workflow Management administrators
- Geographical Information Systems administrators

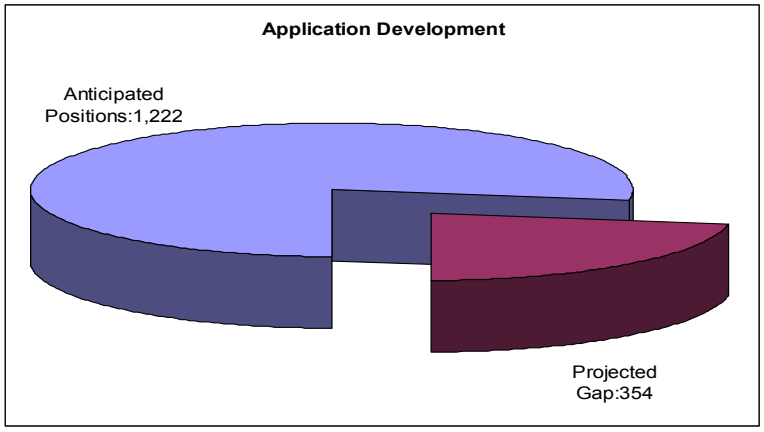


Surprisingly, there is a small projected negative gap (surplus) within the contract management skill set.

There is a broad "Other" component to this category where respondents entered staffing needs that did not fit neatly into the pre-defined skills listed in the survey. This catch-all area, which contains 11.5% of the positions within this functional area, shows a 26% gap in the coming four years.

Application Development

Within the Application Development functional area, there is a projected gap of approximately 29%, indicating a critical need to recruit and retain programmer analysts and other software developers. Unsurprisingly, those surveyed indicate that there will be a smaller number of staff using legacy languages (such as MUMPS and PL1), however in percentage terms, there will be a critically high gap in staff possessing those skills. Application development languages such as C#.Net and Java also show high estimated gap, because there is high demand for developers skilled in these modern languages. The skills with the highest Application Development gap percentages include:



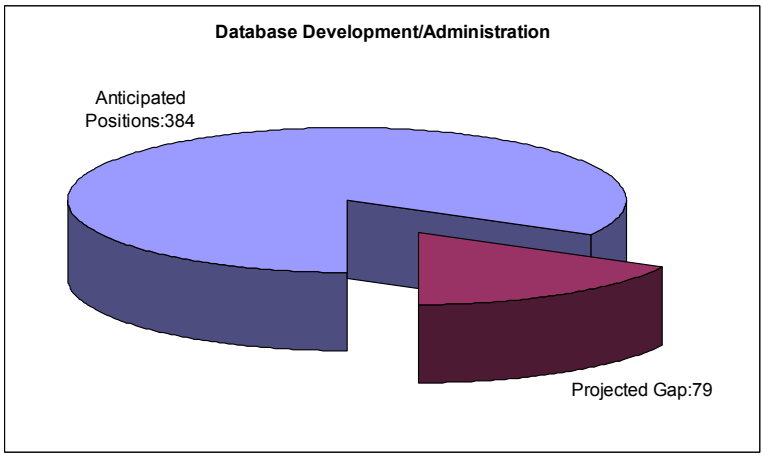
- Assembly
- Java, J2EE, JavaScript
- VB.NET
- ASP.NET
- PL1

Skills with lower estimated gaps include:

- Active Server Pages (ASP)
- Power Builder

Database Development/Administration

Within the Database Development/Administration functional area, there will be a gap of approximately 21% over the next four years. Specific skills with the largest percentage gap include:



- FoxPro
- DB2
- Adabas
- "Other" (Skills not listed in the survey, such as in-house or COTS database products)

Those skills with smaller gaps include:

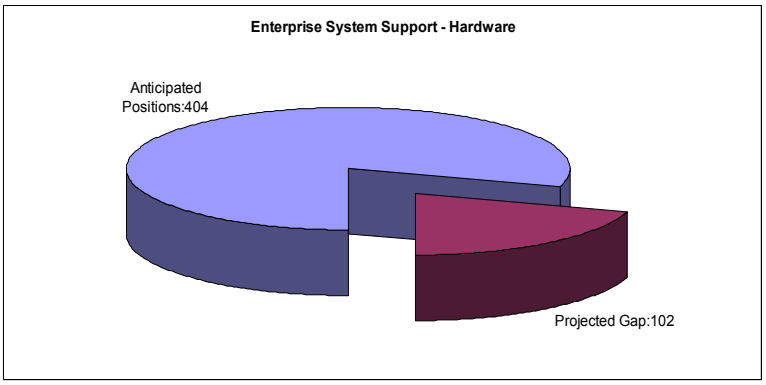
- MySQL
- Access
- dBase
- Informix
- Microsoft SQL Server

Although there is a less critical shortage of the five skills above, there is still a projected gap in every Database Development/Administration specialty.

Enterprise System Support - Hardware

Within the Enterprise System Support – Hardware functional area, there will be a gap of approximately 25% over the next four years. In this area, every specific skill surveyed had a reported shortage, with staffing levels falling short by 14% (Unix/RISC) to 33% (Blade Servers). Other skills with the largest gap include:

- Network Attached Storage (NAS)
- Mainframes and Mainframe Printers
- Centralized UPS systems
- Tape Libraries

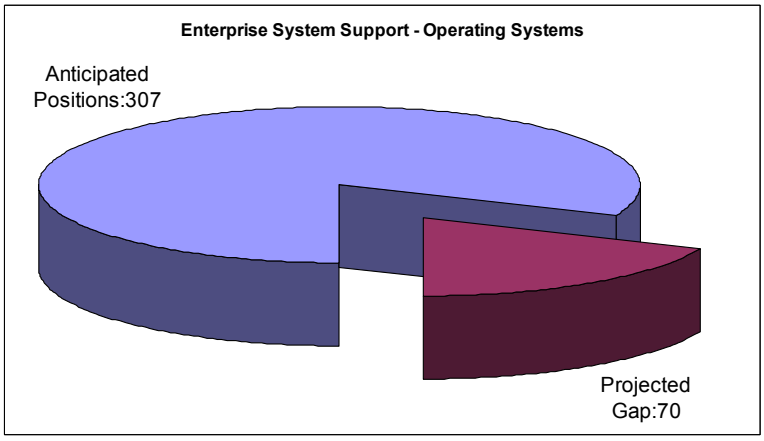


Enterprise System Support – Operating Systems

Within the Enterprise System Support – Operating Systems, there will be an overall gap of approximately 23% over the next four years. Those skills most in demand will include:

- ZOS
- OS390/OS400
- Sun OS/Solaris
- Netware
- Unix Variants (AIX, HPUX, etc.)

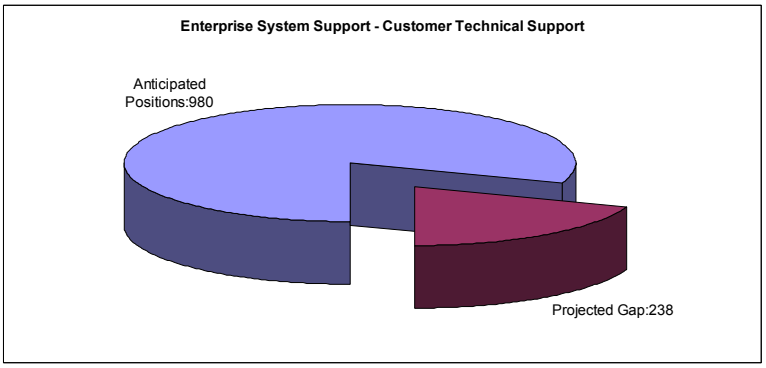
The only skill within this functional area with a negative gap (surplus) projected is Mac OS.



Enterprise System Support - Customer Technical Support

Enterprise System Support - Customer Technical Support showed an overall projected gap of 24%. This projected gap spans every skill area:

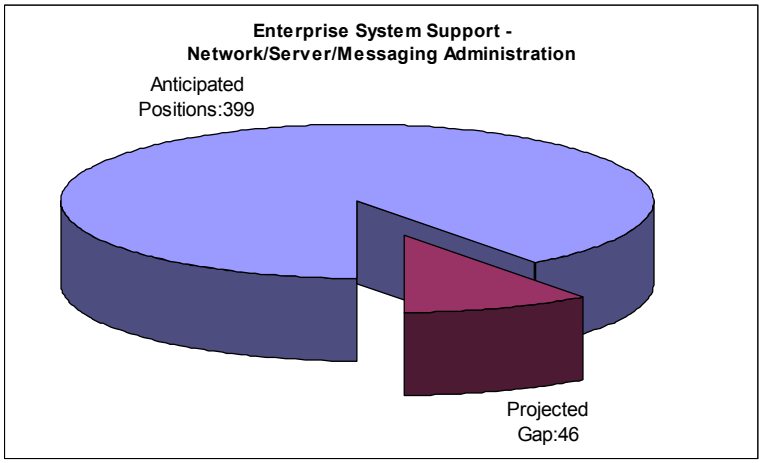
- Desktop/Mobile Computing Technical Support
- Help Desk/Call Center Support
- Production Control
- “Other” (Catch-all group)



Enterprise System Support - Network/Server/Messaging Administration

Enterprise System Support - Network/ Server/Messaging Administration showed an overall projected gap of 12%. The highest gaps were reported in the following skill areas:

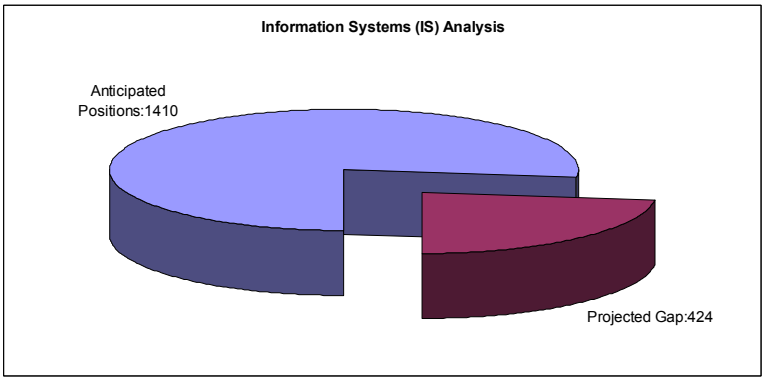
- Lotus Notes
- Blackberry Enterprise Services
- Microsoft Exchange
- Web Conferencing



Information Systems (IS) Analysis

Survey respondents reported a critical gap of 30% in the Information Systems (IS) Analysis areas. These business-oriented technical positions typically are performed by staff in the ISA classifications, and include a broad array of quality control, training, planning, and procurement functions. Among the skills with the highest projected gaps in this area are:

- Quality Assurance
- Project Management
- Technical Writing
- Data Administration
- Business Requirements
- IT Training

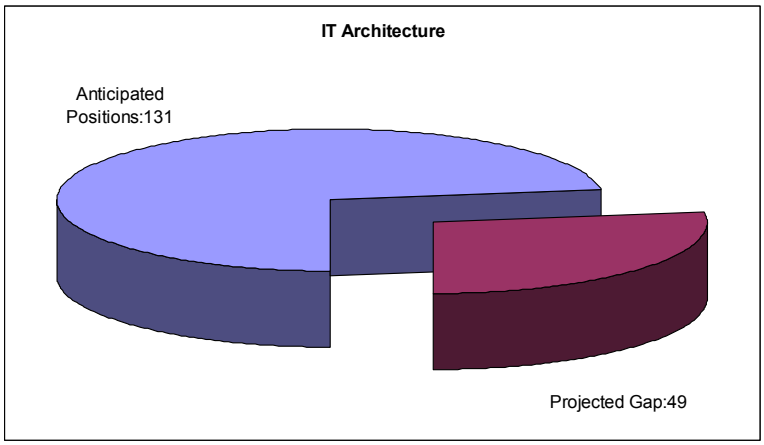


None of the thirteen skills in the IS analyst functional area is projected to have a surplus, with the smallest gap reported for IT Policy Analysis (internal manual creating and editing, etc.) at 14% gap.

IT Architecture

There are fewer IT staff statewide working in the IT Architecture role than more widespread functions such as development and IS analysis. Because of the small group size, it is difficult to estimate accurately the gap percentage over the next four years. Using a sample size of 131 IT Architecture-related positions, estimated gap is 37%. This gap runs across all component skill sets:

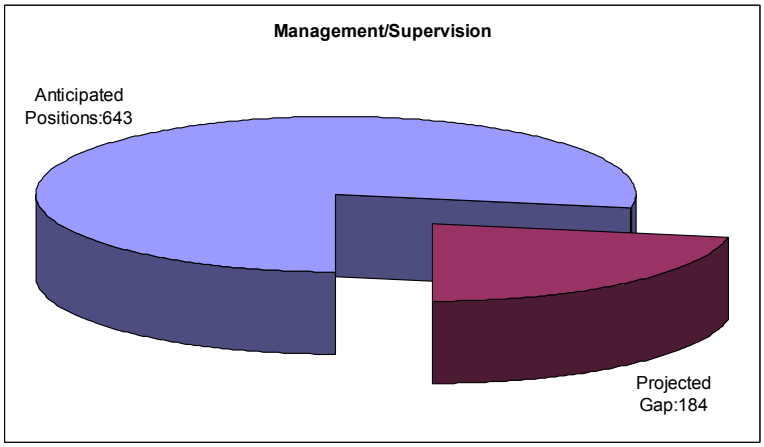
- Security Architect
- Data Architect
- Application Architect
- Infrastructure Architect
- Integration Architect
- "Other" (Catch-all group)



Management/Supervision

On average, IT management and supervisors tend to be older and closer to retirement than employees in the other IT functional area. Because of this age difference, and the difficulty faced in selecting qualified managers, the state faces its highest gap in the survey in the Management/Supervision functional area at 29%. This overall gap includes:

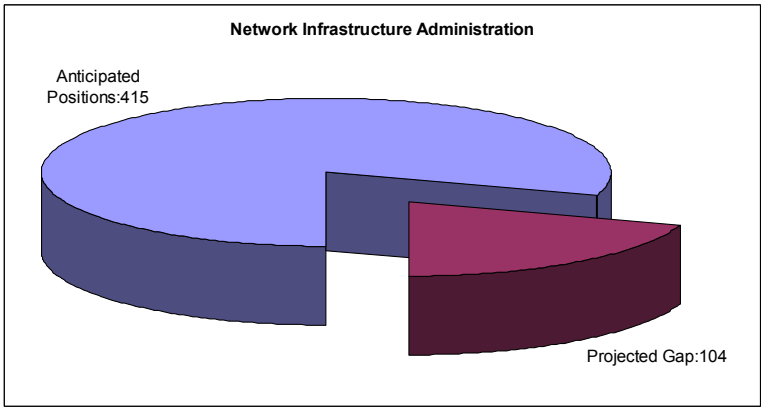
- 30% gap in IT Management (based on 342 projected positions)
- 34% gap in IT Supervisors (based on 297 projected positions)



Network Infrastructure Administration

Network Infrastructure Administration showed an overall projected gap of 25%. Skills with the largest gap over the next four years include:

- Radio
- Private Branch Exchange (PBX)
- Voice over IP
- Wide Area Network (WAN)
- Wireless Networking
- Banyan Vines
- Satellite

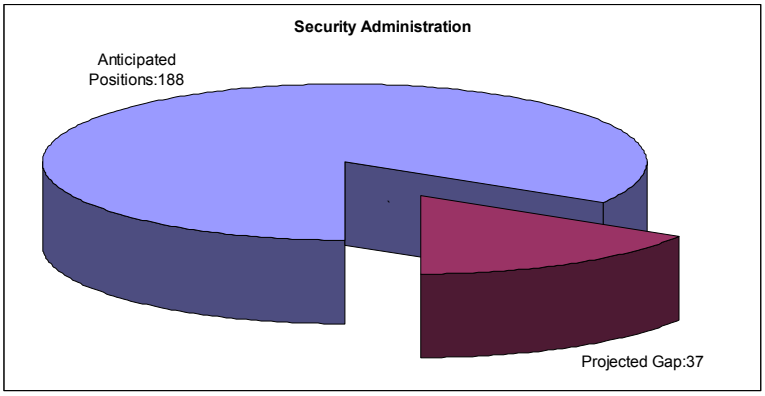


Skills in the Network Infrastructure Administration functional area with smaller projected gaps include:

- Local Area Network (LAN)
- Video Conferencing
- Repeaters
- Switches
- Remote Access Service (RAS)
- Firewalls
- Storage Area Network (SAN)
- Teleconferencing
- Virtual Private Network (VPN)

Security Administration

Arguably one of the most important functional areas within IT, security administration workers are charged with keeping the state's confidential data and networks secure, free of viruses, and safeguarded against intruders. Every skill surveyed within the Security Administration area shows a gap in the coming four years. Overall, this functional area faces a projected gap of 19%. From largest to smallest projected gap, the skills surveyed in the Security Administration area are:



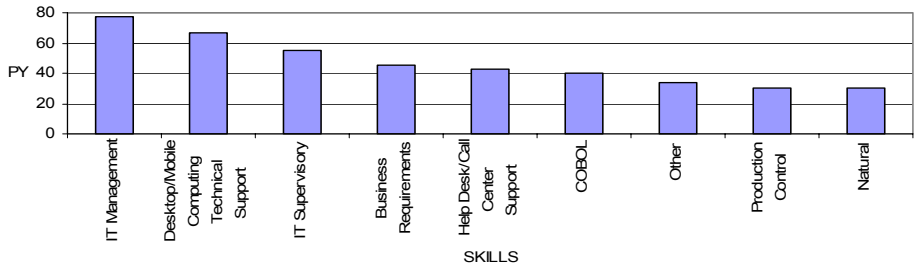
- Intrusion Prevention System (IPS)
- RACF
- Application Security Administration
- Encryption
- Event Correlation
- Intrusion Detection System (IDS)
- Antivirus
- Anti-spam
- Other
- Security Patch Management

Skill Set Data

Skill Set Trends

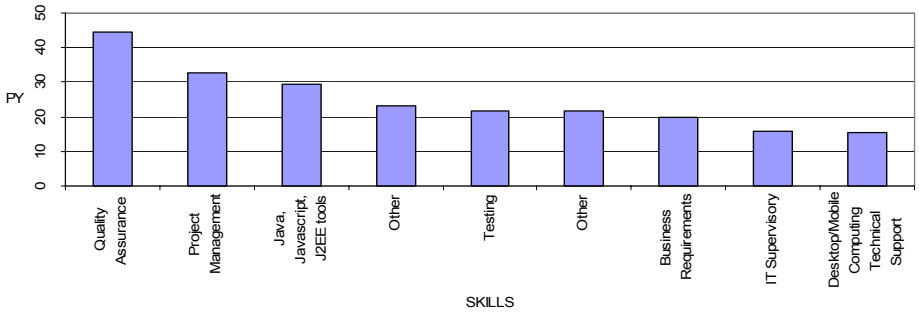
The chart below shows the skill sets where IT Management anticipates the highest levels of attrition by number of positions over the next 4 years. Most notable is the management and supervisory area, which shows an overall projected gap of over 130 PY's within the sampled data, implying a need for over 150 managers and supervisors over the next four years. Because managers and supervisors are generally promoted from rank and file positions rather than recruited from outside the state, it is clear that supervisory and management training programs should be a large component of the state's succession planning efforts.

Top 10 Skill Sets With Highest Attrition



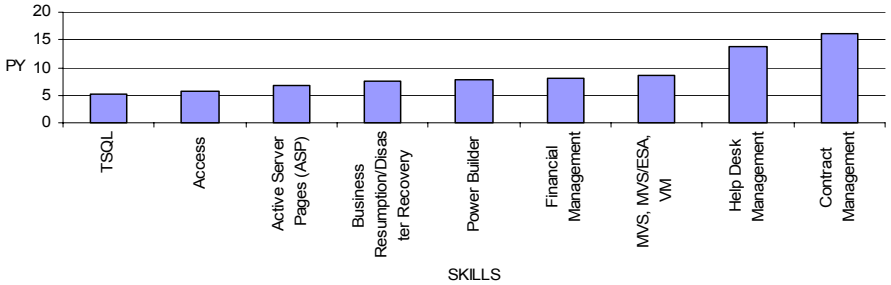
The chart below shows the skill sets where the number of staff in the future is higher than currently in place, indicating a trend toward the skill sets. The inclusion of Quality Assurance, Project Management, Testing, and Business Requirements demonstrates awareness by management of the need to improve the quality of products and services being produced for our customers.

Greatest Growth by Skill Set



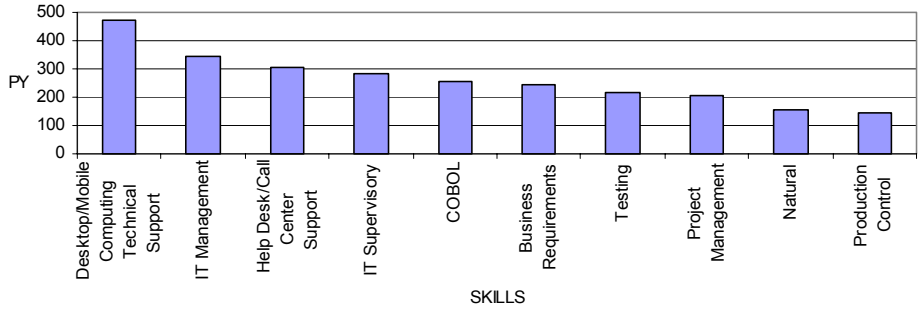
The chart below represents those skill sets for which the number of staff required in the future is lower than the number currently in place, indicating a trend away from those skill sets.

Largest Reduction in Skill Set



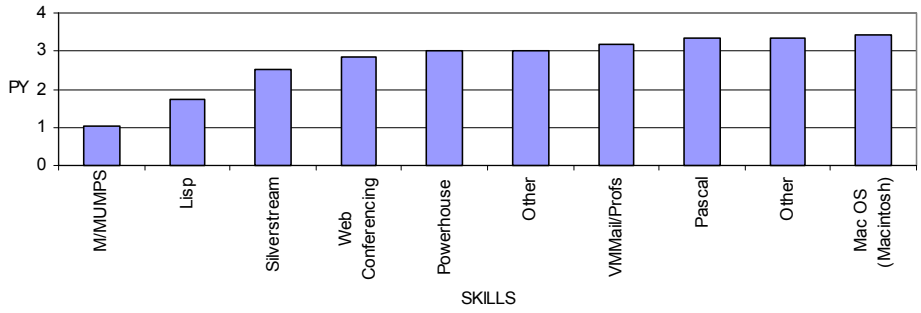
The chart below shows the skill sets with the highest number of current PY's surveyed.

Most Utilized Skill Sets



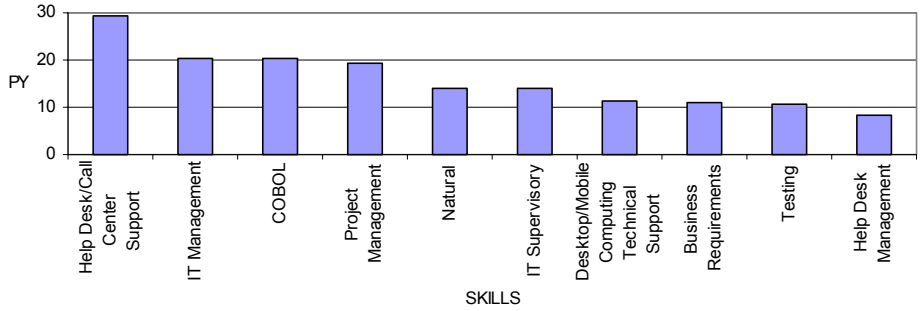
The chart below represents those skill sets with less than 5 total PY's. It is important to note that fractional values were reported in the survey. For example, a Programmer Analyst who spends 90% of his/her time on C++ projects, but also maintains a legacy Pascal system with the remaining 10% of his/her time would contribute 0.1 PY's to the "Pascal" skill below. The chart does *not* indicate that only 3 employees in the state are using the Pascal programming language.

Least Utilized Skill Sets



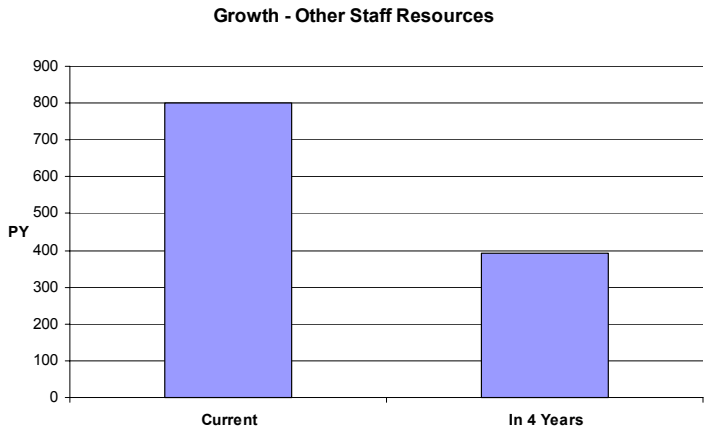
The chart below shows skill areas with high numbers of current vacancies. It is likely that ongoing recruitment efforts are focused on filling these current vacancies, perhaps at the expense of satisfying skills needs anticipated over the longer 4-year survey period.

Highest Current Vacancy by Skill Set



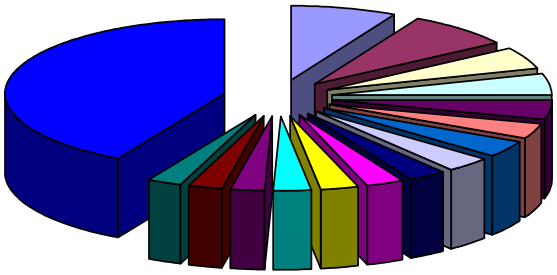
Other Staff Resources

It is interesting to note that the survey data indicates a significant decrease in 'other staff resources' over the next four years. Because the ITMA XIII survey did not collect data related to how these positions are used, it is unclear why there is such a significant reduction in this type of staffing. Non-permanent state IT employees, such as students, retired annuitants, and consultants, fill IT roles representing approximately 10% o f the total current IT workforce. Ten of the fifteen highest-staffed skill sets also appear in the top 15 skill sets of these non-permanent "other staff resources." These findings may indicate a shortfall of skilled and trained permanent IT staff to fill these needs, or inadequate IT state positions (PY's) to support current systems needs.



As expected, two notable exceptions to the above are IT management and IT supervision, where virtually all positions are occupied by permanent state staff.

Other Staff Resources - Top 15 Skill Sets

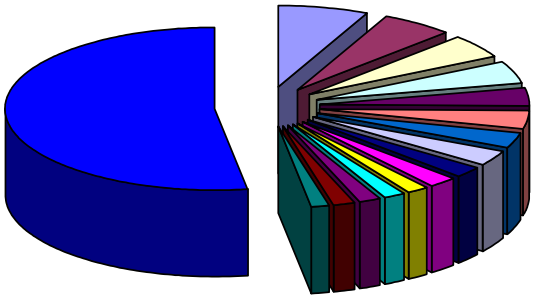


SKILL SET	PY's
Helpdesk/Call Center	63
Natural	61
IT Project Management	39
Desktop/Mobile Computer	37
Business Requirements	33
"Other"- Info Sys Analysis	28
Windows	28
"Other"- Application Dev	25
Java, Javascript, J2EE Tools	24
"Other"- Network Infr Adm	23
Testing	22
Technical Writing	21
Quality Assurance	21
Cobol	20
Local Area Network (LAN)	19
Totals Top 15 Skill Sets	464
Remaining 144 Skills Combined	336
Total Statewide "other staff resources"	800
Percent of top fifteen	58%

Most Used Skill Sets

48% of the total PY's surveyed fall into the top 15 skill sets. Keep in mind that the 15 skill sets represent only 9% of the 158 skill sets used in the survey. The top fifteen skill sets are presented here in the order of the highest to the lowest numbers of PY's in that skill set:

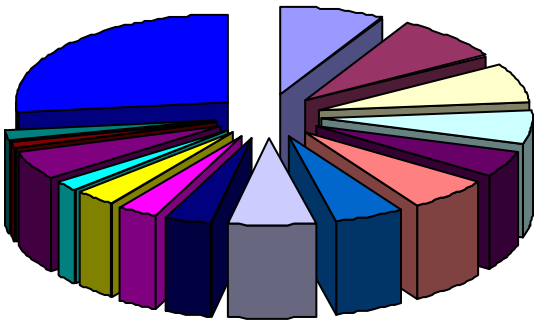
Most Used Skills - PY's Per Skill Set



SKILL SET	PY's	% of All PY's
Desktop/Mobile Computer	474	6.9%
IT Management	379	5.5%
IT Supervisory	330	4.8%
Helpdesk/Call Center	305	4.4%
Cobol	258	3.7%
Business Requirements	246	3.6%
Testing	218	3.1%
IT Project Management	206	3.0%
Natural	157	2.3%
Production Control	143	2.1%
"Other"- Info Sys Analysis	121	1.8%
IT Procurement	114	1.7%
"Other"- Application Dev	112	1.6%
Windows	111	1.6%
Windows/Novel/PC Server	106	1.5%
Totals	3280	47.6%
Remaining 144 Skills Combined	3625	52.4%
Total Statewide, including vacancies	6905	
Percent of top fifteen		48%

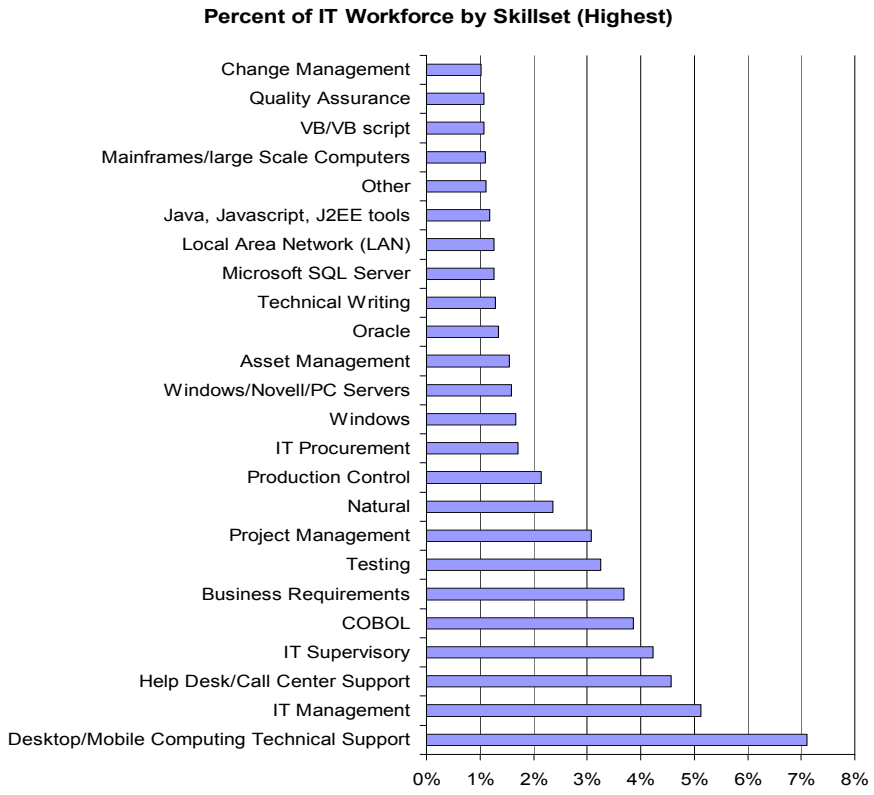
The top fifteen skill sets presented above also account for approximately 73% of the total gap forecasted, as shown in the chart below.

Most Used Skills - GAP per Skill Set



SKILL SET	GAP	% of GAP
Desktop/Mobile Computer	93	8.0%
IT Management	98	8.4%
IT Supervisory	85	7.3%
Helpdesk/Call Center	72	6.1%
Cobol	56	4.8%
Business Requirements	76	6.5%
Testing	60	5.1%
IT Project Management	80	6.8%
Natural	42	3.6%
Production Control	34	2.9%
"Other"- Info Sys Analysis	36	3.1%
IT Procurement	21	1.8%
"Other"- Application Dev	62	5.3%
Windows	14	1.2%
Windows/Novel/PC Server	23	2.0%
Totals	852	72.9%
Remaining 144 Skills Combined	314	26.9%
Total Statewide, including vacancies	1166	
Percent of top fifteen		73%

The chart below gives a graphical view of where the highest percent of IT's workforce is focused. As one might expect, PC Support and Help Desk combined represent the most IT staff (11%). The skill sets "IT Manager" and "IT Supervisory" combined represent 9% of current PY's. Since most IT supervisory staff also fills technical roles, the percentage here does not accurately reflect the true number of IT first and second line supervisors. It would be more accurate to say that of all time spent on IT activities statewide, 9% is spent on management/supervisory duties. Project management activities, certain programming languages, programming activities, and IT procurement round out the top 15 most heavily-staffed skill sets.

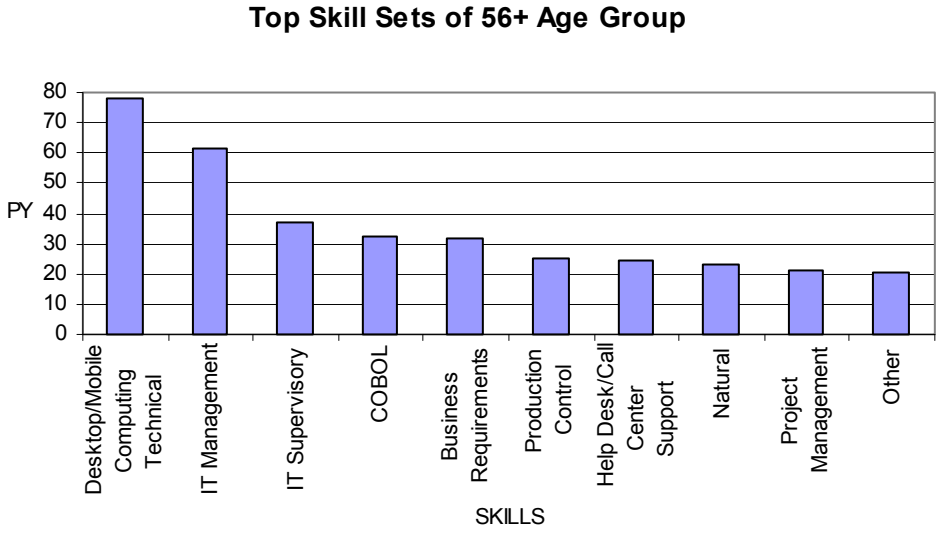


High Risk Skill Sets

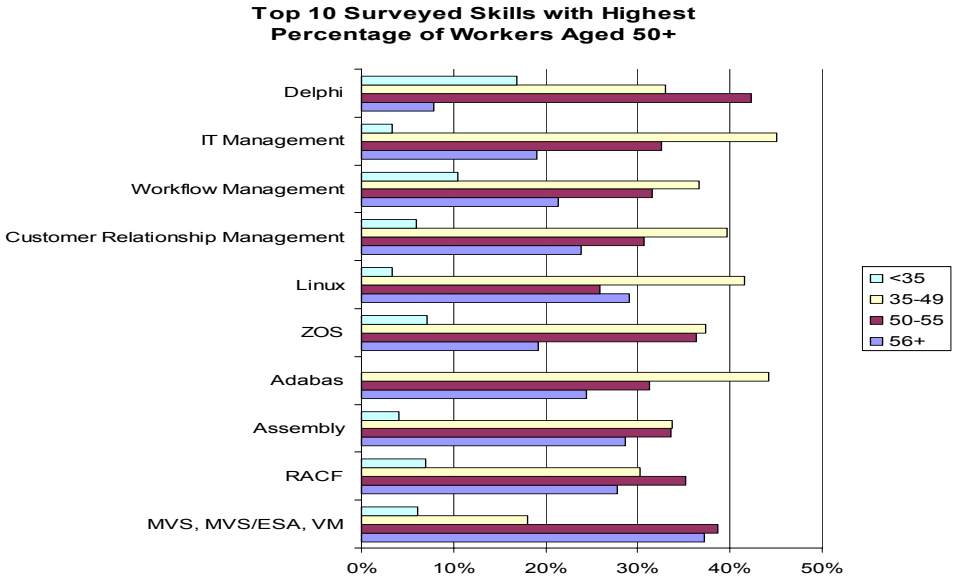
There are a variety of ways to look at the data from the survey in order to identify which skill sets are at highest risk. In general, skill sets can be determined to be at risk due to:

- The large proportion of employees in older age ranges occupying a skill that will still be needed in the next four years
- High projected gap due to attrition or new projects which require the at-risk skill

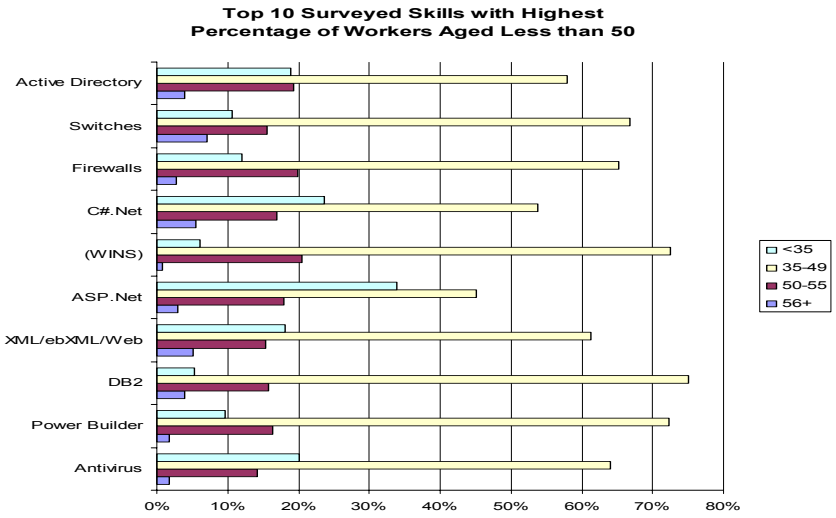
The following three charts paint different, but important views into the data. The first chart identifies the top 10 skill sets that are currently occupied mainly by staff older than 55 years of age. One can assume that these skill sets are at risk because there is a higher probability of these staff leaving state service. The skill sets occupied by this group of staff vary from desktop support, to mainframe systems, to management. Based on the data, this age group will have an impact across multiple functional areas.



The following chart examines the top 10 skill sets where the highest percentage of staff within the skill set are 50 years of age or older. The data shows that 5 of these skill sets are mainframe technologies. One may assume that the ongoing support of the State of California's mainframe systems is at risk. If one assumes that the average age of retirement is 57, within 10 years, the identified skill sets within this chart will lose in excess 50% of the total workforce.

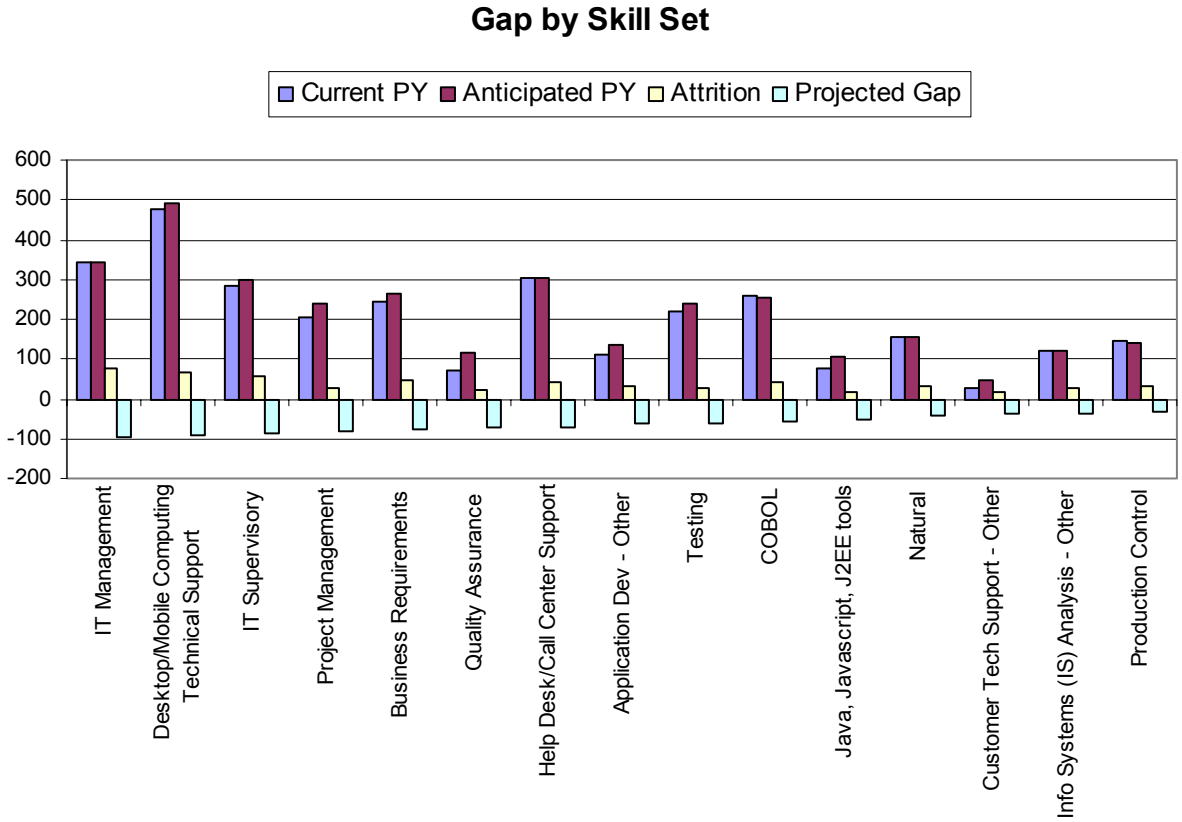


Finally, the next chart shows the top 10 skill sets where the highest percentage of staff within the skill set are 49 years of age or younger. These skill sets represent the lowest risk due to attrition. It is interesting to note that all of these skill sets are either in the networking, server, and database related technologies.



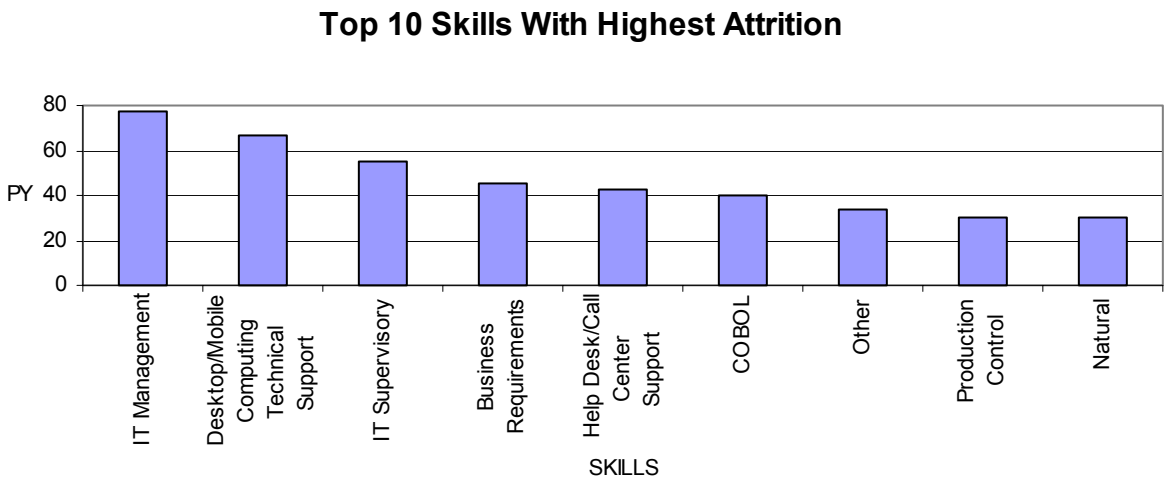
Skill Sets with Highest Gap

The chart below clearly shows the areas in which over the next four years, the State of California will have the greatest need. There are five skill sets included in this chart which indicates an increase in awareness for the need to improve the quality of products and services being produced for our customers (project management, business requirements, quality assurance, testing and technical writing). Each of these also shows a growth in staffing over the next four years.



Skill Sets with Highest Attrition

In the following chart, surveyed attrition numbers have been converted to percentages to give a comprehensive picture of critical skill set loss throughout the state's IT workforce. As anticipated, older technologies have a larger percentage of staff attrition reported. The highest percentage of attrition, almost 60%, was reported in the MVS, ESA and VM skill sets.



Conclusions

Though this report is not a complete succession plan for the State of California's IT workforce, it provides a solid grounding upon which to build a plan. The survey backing this report allowed ITMA XIII to take the necessary step of gathering precise quantitative information on current IT staff, projected attrition, and future staffing needs. It is hoped that this data will directly support both department-level managers and the state CIO as they build their succession plans as outlined by Goal 5, Objective 1 of the California State Information Technology Strategic Plan. For some ideas on how to apply the data in this report, please refer to Appendices I and IV.

Strategies for Bridging the Gap

At one's fingertip exist numerous sources of information containing suggestions, recommendations, and strategies for succession planning. Many sources provide strategies that may not be applicable to the State of California's standards and regulations, so caution is urged while considering one's own actions.

The Department of Personnel Administration recently published a State of California Workforce Planning Model. The Employment Development Department published its ITB Succession Plan covering Fiscal Years 2005 - 07. Both documents provide guidance for workforce and succession planning. The documents can be accessed on their web sites listed below. Appendix IV contains extracts from other highly touted planning reports.

DPA Workforce Planning Model - http://www.dpa.ca.gov/general/publications/manuals/WF_planning/

EDD ITB Succession Plan - http://www.cio.ca.gov/PDFs/EDD_Succession_Plan.pdf

General recommendations:

- Follow the DPA model.
- Perform workforce planning annually.
- Keep one's IT Plan and Business Plan current and in-sync.

Lessons learned

There are many factors that contributed to the survey's overall success. The relevance of the topic, support from the State CIO's office and DTS, ease of use and support during the survey period all contributed. The synergy achieved by the ITMA contributed profoundly to the success of the effort. Early team building, division of work efforts, redundant team leads / project managers and the enrollment of team members were significant success factors.

The survey topic was extremely relevant. Succession planning is a topic that has been gaining greater emphasis with the baby boomers entering retirement age. Succession planning is a subject covered in the California Performance Review, the State CIO's Statewide IT Strategic Plan, and has been addressed by individual agencies such as the Employment Development Department.

Right from the start of the academy, the State CIO offered his support. The State CIO provided access to state IT executives and issued memorandums through his office. It should be noted that the initial project schedule did not accurately predict the amount of time needed to review these memorandums, future ITMA classes should account for this in their schedules. The Department of Technology Services provided the infrastructure necessary to develop and implement the survey tool. Additionally, the Department of Consumer Affairs played an early role by providing web forums as a means of communication for team members.

Maximum ease of use was a priority in survey design. Prototypes were developed using free web based survey instruments, which were then presented to class members, managers, and sponsors. The web

based delivery also made it easier for respondents to complete the survey. During the survey period, ITMA XIII members provided immediate support to survey respondents. This support ranged from clarifying the survey directions and results to keying in responses for individual departments. The goal of these efforts was to make it as easy as possible for the survey respondents.

These survey best practices would not have ensured success without the teamwork and dedication of the ITMA XIII members. ITMA XIII jump-started efforts by leveraging the governance and team rules of the prior Academy (ITMA XII). This allowed ITMA XIII to develop comprehensive project plans early in the project. As with most projects, resources were divided into individual teams. Unlike many other projects, redundancy was built into the team lead and project manager roles. All academy members have workload responsibilities to their individual departments; the redundancy allowed members flexibility to address these department needs.

Lastly, the dedication demonstrated by ITMA XIII members was beyond belief. Academy members were enrolled in the project and built strong relationships and work behaviors. Members readily worked late evenings and weekends to accomplish their goals and worked equally hard to resolve differences. These were the lessons learned by ITMA XIII.

Information on ITMA XIII's Survey Tool and Documentation

Information Technology Management Academy XIII developed this web-based survey to aide in state IT succession planning by identifying future shortages of personnel in specific IT skills. ITMA XIII intended for and hopes that this tool will be used again in the future, allowing state IT to repeat our succession planning effort in future years.

The Department of Technology Services Training Center (DTSTC), host of the IT Management Academy, owns the survey tool. DTS, perhaps in conjunction with the State CIO and future ITMA classes, will determine when and how future surveys will be conducted. It is our hope that DTS and the rest of CA State IT will find the tool to be useful in its succession planning and will continue to use it in future years.

Please visit the DTS Prior IT Management Academies webpage listed here for further information on the class, the survey tool and other documents, downloads and information related to ITMA XIII. http://www.dts.ca.gov/Training/itma_previous.asp?key=2013

Appendix I (References)

California's Department of Personnel Administration (DPA) "California State Government Workforce Planning Model": DPA California State Government Workforce Planning Model (http://www.dpa.ca.gov/general/publications/manuals/WF_planning/index.cfm)

California's Employment Development Department (EDD) Information Technology Branch (ITB) Succession Plan link is available through the California State CIO website:

http://www.cio.ca.gov/PDFs/EDD_Succession_Plan.pdf

New York State's "Work Force and Succession Planning – Planning Guide": Work Force and Succession Planning - Planning Guide (http://www.cs.state.ny.us/successionplanning/planning/index.html)

Office of Personnel Management, The Federal Government's Human Resources Agency – ***"Optimizing Organizational Performance - Workforce and Succession Planning" (www.opm.gov/hr/employ/products/workforce/workforce.asp)***

Georgia Merit System, Workforce Planning website: Georgia Merit System Workforce Planning. (http://www.gms.state.ga.us/agencyservices/wfplanning/index.asp)

State of Washington's HR website, "Workforce Planning Guide": State of Washington Workforce Planning Guide: Right People, Right Jobs, Right Times. (http://hr.dop.wa.gov/workforceplanning/wfpguide.htm)

State of Minnesota Workforce Planning Website State of Minnesota - Department of Employee Relations (http://www.doer.state.mn.us/wfplanning/)

Succession planning overview Beginner's Guide to Succession Planning (http://beginnersguide.com/management/succession-planning/)

Minnesota Succession planning – DOT:
Succession Planning - Building Leadership Capacity (http://www.nhi.fhwa.dot.gov/transworkforce/innovative_detail.asp?article_id=31&toc_id=171)

Appendix II (ITMA XII High-Level Core Competencies)

High-Level Core Competencies	
Application Software Development	Information Systems Security Administration
Customer Technical Support	IT Business Consultants
Database Development and Administration	IT Technical Document Writer
Emerging IT	Network/Client Server Administration
Enterprise Systems Support	Web / Internet Development

Appendix III (Functional Areas and Associated Skill Sets)

Application Administration	
Asset Management	Geographical Information System (GIS)
Change Management	Help Desk Management
Contract Management	Human Resource Management
Customer Relationship Management	Imaging
Document Management	Project Management System
Enterprise Resource Planning (ERP)	Web Content Management
Facility Management	Workflow Management
Financial Management	Other
Application Development	
4th Dimension	Natural
Active Server Pages (ASP)	Pascal
Advance Function Presentation (AFP)	PERL
ASP.Net	PHP
Assembly	PL/SQL
C/C+/C++	PL1
C#.Net	Power Builder
Clipper	Powerhouse
COBOL	Prolog
ColdFusion	Rexx
Delphi	Silverstream
Eiffel	Small Talk/Squeak
Flash	TSQL
Forte'	VB/VB script
Fortran	VB.Net
HTML	xBase
Java, Javascript, J2EE tools	XML/ebXML/Web Services Software
Lisp	Other
M/MUMPS	
Database Development/Administration	
Access	IDMS
Adabas	Informix
Cache'	Microsoft SQL Server
Clipper	MySQL
DB2	Oracle
dBase	Sybase
FoxPro	Other
Enterprise System Support - Hardware	
Mainframes/large Scale Computers	Network Attached Servers (NAS)
Mini/Midrange Computers	Tape Libraries
Unix/RISC Servers	Centralized Uninterrupted Power Supplies (UPS)
Windows/Novell/PC Servers	Mainframe Printers
Blade Servers	Other
Enterprise System Support - Operating Systems	
Linux	ZOS
Mac OS (Macintosh)	Sun OS/Solaris

MVS, MVS/ESA, VM	Unix (e.g., AIX, HPUX)
Netware	Windows
OS 390/OS 400	Other
Enterprise System Support - Customer Technical Support	
Help Desk/Call Center Support	Production Control
Desktop/Mobile Computing Technical Support	O+B112ther
Enterprise System Support - Network/Server/Messaging Administration	
Apache	GroupWise
Microsoft IIS	Lotus Notes
Active Directory	Microsoft Network Servers
Blackberry Enterprise Server (BES)	Novell Network and Servers
Domain Name Service (DNS)	VMMail/Profs
Dynamic Host Control Protocol (DHCP)	Web Conferencing
Enterprise Faxing	Windows Information Naming Service (WINS)
Exchange	Other
File/Print	
Information Systems (IS) Analysis	
Business Requirements	IT Training
Business Resumption/Disaster Recovery	Project Management
Data Administration	Quality Assurance
Graphic Design	Technical Writing
IT Policy	Testing
IT Procurement	Other
IT Strategic Plan	
IT Architect	
Application Architect	Integration Architect
Data Architect	Security Architect
Infrastructure Architect	Other
Management/Supervision	
IT Management	Other
IT Supervisory	
Network Infrastructure Administration	
Banyan Vines	Storage Area Network (SAN)
Dynamic Virtual Private Network (DMVPN)	Switches
Firewalls	Teleconferencing
Hubs	Video Conferencing
Local Area Network (LAN)	Virtual Private Network (VPN)
Private Branch Exchange (PBX)	Voice over IP
Radio	Wide Area Network (WAN)
Remote Access Service (RAS)	Wireless Networking
Repeaters	Other
Satellite	
Security Administration	
RACF	Event Correlation
Anti-spam	Intrusion Detection System (IDS)
Antivirus	Intrusion Prevention System (IPS)
Application Security Administration	Security Patch Management
Encryption	Other

Appendix IV (Succession Planning Strategies)

General Strategies

- Identify the skill sets that are at highest risk (use the Gap analysis report for your department).
- Of the highest risk skill sets, identify which skill sets are critical to achieving your department's strategic plan
- Identify critical soft skill sets needed to achieve your department's strategic plan
- Assess the level of skill for each employee for each of the critical skill sets, including soft skill sets
- Use these general strategies when moving forward with the other strategies listed below

Staff Development Strategies

- Create staff development plans for employees to meet both the department's and employee's needs
- Monitor and access each employee's progress, make adjustments as necessary
- Create development plans for each manager/supervisor to meet both the department's and employee's needs
- Monitor and access each manager/supervisor's progress, make adjustments as necessary
- Clearly define career ladders for positions within your department to provide professional growth opportunities for employees within their current assignments. Focus on critical positions initially
- Consider sponsoring on-site college programs in cooperation with California Colleges and Universities
- Develop a partnership with California Colleges and Universities to teach and develop students with the skills needed within the State work force
- The State CIO promotes use of the online version of the IT Management Academy XII's *IT Personnel Professional Development Manual*.

Knowledge Transfer Strategies

- Further define the knowledge, skills and abilities needed for each skill set – understand what you really need
- Identify ways to determine staff's abilities to move in a particular direction or field of work
- Develop cross-training programs within your department to facilitate deepening skill levels, enhancing productivity, and providing back-up for important functions. Particular emphasis is placed on cross-training in areas where employees are eligible for retirement, so that the agency retains institutional knowledge

Mentoring programs:

- Develop a mentoring program which would pair entry-level professionals with mentors from the area in which they are to be trained
- This strategy enables the mentor to transfer their knowledge and skills in a real world environment
- This also allows the trainees to learn more about the department and ensure their professional development is well-formed and is representative of their work environment
- Have retiring employees mentor employees in the unit for a period of time before they retire
- Work with the Department of Personnel Administration to gain their approval to: allow a retiree's successor to be appointed to a duplicate or project position to "shadow" the incumbent for a period of time so the successor can learn the job first hand or hire a retiree for the express purpose of mining knowledge and expertise

- Determine whether your department has knowledge transfer strategies that will ensure employees are well equipped to assume new duties. Ensuring you have the following will help your department be successful with knowledge transfer strategies
- Require work methods and procedures be well documented
- Processes, methods, tools, and techniques of employees with special skills and responsibilities are well documented
- A functioning communications structure which facilitates sharing of information across all organizational boundaries
- Standards have been established around the retention and availability of valuable information on important events or decisions
- Standards have been established around archiving material critical to documenting the institutional history of your department
- Processes around capturing the knowledge of experienced employees before these employees leave the agency have been documented and are being used
- Videotape or audio tape important meetings, events, and presentations

Recruitment and Selection Strategies

At the State level

- Market the State as an employer of choice
- Promote employment opportunities to attract a qualified and diverse workforce
- Create a focus to develop innovative recruitment strategies and techniques
- Identify which recruitment and selection strategies compliment each other, and afford the best opportunity to build the workforce you need. For example, pairing an on-campus college recruitment job fair with on-the-spot exams and list eligibility will allow your department to make immediate job offers to candidates. This reduces the risk of losing viable candidates to other employers who are in a position to make immediate job offers
- Make use of California State Personnel Board's State Vacancy Search (formerly VPOS), job fairs, Capitol Weekly, and other opportunities to get the word out

Exams

- Assess your current exam plans (written test, patterned interview, experience, and education application) to determine whether it is still current, appropriate, and helpful in establishing a list of qualified candidates for a specific classification
- Use special exam strategies as appropriate, such as an on-line exam, position-specific and program-specific testing, performance assessment, or education and experience test.
- Consider using continuous recruitment and spot recruitment exams
- Use other agencies and state as benchmarks to look at new and different ways to address recruitment challenges

Trainee, Intern and Student Assistant programs

- Internship programs provide an opportunity for individuals to gain the knowledge, skills, and abilities necessary to perform well in the examination process

Retired Annuitants

- Rehiring of a retiree from a critical function to come back part-time for a period of time provides an opportunity to minimize the loss of institutional knowledge
- Create an array of realistic, practical ideas and options for hiring retirees

Retention Strategies

- A June 2001 survey conducted throughout several industries indicated the number one reason employees remain at a company is the presence of growth and development opportunities. In those same surveys, fair pay and benefits do not rank in the top ten

Changing your image:

- Identify the changes to your department that would improve the quality of "work life" and make the organization a more desirable place to work
- Ensure the work environment is clean, orderly, and professional

For the employee:

- Initiate an Employee orientation class which covers everything from the business your department's in to the department's mission, vision, and values to where the new employee can find a decent cup of coffee on their break. Personalize it!
- Determine if your department "family friendly". Identify what options are available to assist employees in balancing their work and home life. Consider offering the option of flex-time, four-day work weeks, telecommuting, etc.
- Consider offering on-site child care
- Are employees offered opportunities to learn and develop, such as rotational assignments, mentoring programs, training and development assignments, etc.?
- Enhance your current employee recognition program. Offer different types of recognition (ex: instant recognition which allows an employee a way to acknowledge co-workers for exceeding their work-related expectations or a more formal recognition based on criteria related to your department's values, mission, or vision for exceptional performance)
- Conduct exit interviews and administer surveys to find out what employees need and want. Act on the information
- Encourage diversity in your recruitment and staff development strategies
- Encourage collaborative, positive, and enriching relationships between colleagues, supervisors, and managers
- Identify steps to better communicate what the State has to offer, make employment with the State more appealing, and encourage our highly skilled employees to stay

What is Being Done?

- A major collaboration effort among the Department of Personnel Administration (DPA), the State Personnel Board (SPB), and the Service Employees International Union (SEIU), and the Executive Branch through the State CIO office initiated the Information Technology Human Resources Classification and Selection Project in December of 2005. Reference: http://www.cio.ca.gov/PDFs/122205_memo-IT_HR_Project.pdf
- The recent work done to update the Information Technology classifications is a step in the right direction. A broadly described classification series that is competency-based will give an organization more flexibility to recruit, mobilize, and properly compensate
- Using the information from this gap analysis, create a new open exam schedule which will offer open exams more frequently than current cycles allow to match anticipated retirement waves. This will help bring newer candidates into the selection pool at a quicker rate

Points to Consider

- Do you have clear objectives that are understood by all involved?
- Do you have the support of executives and/or key managers?
- Is your action plan consistent with strategic, operational, and budget plans?
- What are the potential obstacles to your success?
- What can you do to minimize the impact of potential obstacles?
- Whom should you tell about the planning effort? Consider developing a communications plan to keep people informed and gain their support for what you are doing. Demonstrate to them how the planning may benefit them
- Are there instances when informing the union(s) would be beneficial? Although staffing related issues are a management prerogative and you don't have to involve the union(s), there may be instances where informing them would help you achieve your objectives
- Would it be beneficial to put together a planning team? If so, who should be on it? Consider program managers, representatives from personnel, training, and organizational development, the program's budgeting analyst, and an IT representative if information systems are a factor
- What other people/groups will the planning process affect? How should they be involved, if at all?

Appendix V (Definitions)

Attrition – Leaving an IT skill sets due to (a) retirement, (b) transfer from one agency to another, (c) separation from service or (d) moving from an IT classification to a non-IT classification

Current Gap – Number of vacancies within a department

Formula for calculating gap – (Sum of all current age group) – (Attrition) – (Number of staff needed to perform work functions). Summarized as $G = \sum C - A - F$

Future Gap - The projection of the existing workforce, adjusted for attrition, with the number of staff required to perform the work functions

IT Workforce – Includes IT rank and file, managers and supervisors

New PY – PY that has been approved in a BCP and will be obtained within the next 2 – 4 years

Other Staff Resources – Includes retired annuitants, temp help, consultants/contractors, student assistants

PY – Personnel Year

PY 56+ - Civil Service Employees over the age of 55

PY 50-55 - Civil Service Employees between the ages of 50 and 55

PY 35-49 - Civil Service Employees at or between the ages of 35 and 49

PY 34 & Below - Civil Service Employees below the age of 35

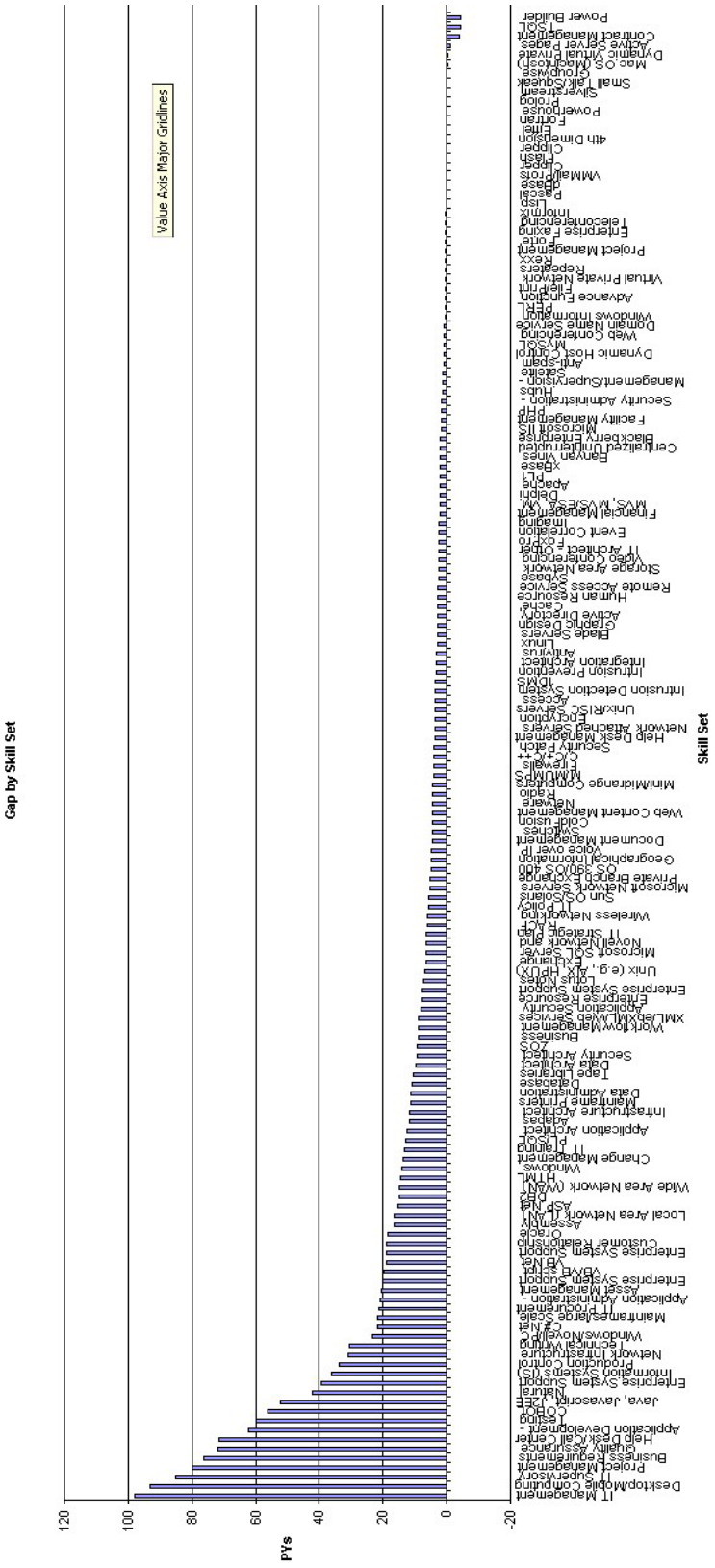
Succession planning - A subset of workforce planning. Its goal is the same, but its focus is specifically on having the right *leadership* in place at every level of the organization"

Total PY's and Other – Sum of all PY's + Other Staff Resources + Vacant PY's

Vacant PY's – All authorized and budgeted PY's that are not currently filled

Workforce planning - Having the right number of people, with the right skills, experiences, and competencies, in the right jobs, at the right time

Appendix VI – Gap by Skill Set for All Surveyed Skills



ACKNOWLEDGEMENTS

The Information Technology Managers Academy XIII (ITMA XIII):

George Akiyama
Pamela Baker
John Bryce
Chris Caietti
Mitch DeGregorio
Amran Din
Germain Fong
Leilani Fowkes
Cynthia Hayden
Jerry Henson
Brenda Keebaugh
Vicki A. Kinman
Caroline Lim
Victor Mendoza
Gail Miller
Lisa Murphy
Michael Nguyen
Colin O'Keefe
Amy Pugh
Vicky Sady
Libby Schram
Tracy Scribner
Brian Shijo
Phil Shipley
Cindy Short
Elizabeth Swearinger

Executive Sponsors:

Carol Fieldhouse
Dale Jablonsky
Calvin Rogers

Class Managers:

Kelvin Kishaba
Candy Sheehan
Bill Welty

Office of the California State Chief Information Officer

Department of Technology Services Training Center Staff

We, the class of ITMA XIII, would like to extend our thanks to everyone who supported or assisted us in making this effort successful.