

2010 SCoPM Performance Excellence Award Application Cover Sheet

Team Name	VoIP Telephone Team
Date Team Operating from	5/15/2006 to present date
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The following information is an overview of the project and, if selected for recognition, will be used for publicity. This part of the application is not scored; however, the narrative is used as background information for the application. By submitting this application, the organization agrees to publication of award winning applications.

Team Purpose:

Voice over IP (VoIP) has a short but illustrious history, especially here in Maryland. In 2006 The Maryland State Highway Administration (SHA) embarked upon a piloted journey to provide its telephone users this technology and to provide a cost savings to the tax payers. The team's goal was simple, aggressive, and yet contained a multi phased approach: A clear path for SHA's goal of Return on Investment (ROI) had to be detailed before the Statewide VoIP Project began. The implementation would leverage the existing aging Private Exchange Branch (PBX) Telephone Infrastructure against the implementation of new Voice Gateway Routers to be installed at each facility equipped with a PBX Telephone Switch. This was termed Statewide VoIP and would put each facility's telephone switch onto the existing Statewide MDOT Data Network. Also all newly constructed or renovated facilities would receive an IP phone to the desktop for each user and was termed Phase II VoIP. The phased in approach would create new VoIP phone users in addition to the existing PBX users. After the feasibility Pilot Project was concluded an Audit was performed at each facility to determine customer requirements as well as technical requirements. After the requirements were fully understood, the VoIP Telephone System was to be programmed to route and handle telephone calls based upon these requirements. The management and maintenance of PBXs, Routers and telephone services would become centralized. Lastly, the "culture" of telephone use by the customers was not to have any significant change due to the Team's efforts.

Impact of Team's Improvement(s):

The VoIP Telephone Team achieved Statewide VoIP Network connectivity at all 7 of the District Offices, Headquarters, the Hanover Complex and most of the 28 Maintenance Shops plus 2 Satellite Shops. Since the inception of the Phase II VoIP Project all new facilities and renovated facilities have had VoIP phones implemented. This was achieved while providing continuing maintenance and support of existing facility PBXs. The customer and technical requirements were documented and implemented into the new VoIP Telephone System. All telephone calls are now handled on a centralized managed system that routes calls around the state in order to bypass leased telephone service toll charges for both local and long distance. An initial estimate of bypassing toll charges provided a major basis for the Return on Investment. The change over to Statewide VoIP Network Connectivity was transparent to PBX users and Phase II VoIP users were able to take advantage of added directory services, simplified conferencing, call forwarding and a large visual information screen on their desktop phone.

Category 1 - Customer Focus

1.1. List the key customers of the team

1.1.a. All 3,004 SHA employees

1.2. Explain **why** you determined that these were key customers

1.2.a. All employees of SHA have need for the use of facility phone systems to place calls between facilities, around the state to contact vendors and contractors and manage maintenance and emergency operations. It is essential for the employees to be able to conduct business, internal and external, through a robust telephone system.

1.3. Explain **how** the team listened to and collected information from the key customers

During the Pilot Project an evaluation of the two separate VoIP implementations was conducted for voice quality which consisted of VoIP Team members, SHA Statewide Telephone Team members and regular SHA employees with a total of 30 evaluators. The evaluation was based upon a Mean Opinion Score (MOS) where the lowest number 1 (unintelligible) to the highest number 5 (toll quality communication link) was used to rate the perceived voice quality. Both implementations were evaluated to have the same voice quality and both were perceived to be toll quality by all evaluators. The VoIP Team conducted on site informational audits of the physical infrastructure of a facility's PBX telephone system. Further, a random sampling consisting of 30 employees were interviewed at their work locations and questioned as to their use of the leased telephone company (Telco) services, operation of the PBX and if there was any particular "culture" they used in their phone operation and handling of calls. The feedback given to the VoIP Team was then used to help plan system requirements.

1.4. Explain **how** the team turned information collected from the customers into requirements

1.4.a. After interviews were conducted a determination was made that 96% of customers were satisfied with the operation of their facility PBX given any limitations beyond what the PBX could provide. The PBX users understood that their phone "culture" would not change and having their facility connected to a statewide network would be transparent to their use. All potential Phase II VoIP users had to be interviewed because their individual information would be input into a managed statewide call handler. The Phase II VoIP users expected a level of phone service higher than that of the PBX users, because of the new technology. The customer made it clear that placing and receiving calls, regardless of the system used, was primary and other functions such as Voice Mail and desk phone functions were secondary. Success at the customer level meant hearing their concerns, formulating a plan and implementing the requirements expressed to the VoIP Team. Success at the system level required keen knowledge, data collection, centralized planning and programming in order to fulfill the technical requirements. Both of these measures required corrective actions after the implementation. We found that we needed to refine the information that was the basis of the customers' expectation of functionality of the VoIP phones. Further we found that once customers had a better understanding of the new technology then we were able to program small changes into the system that affected their individual use of the system. We learned that when small details are missed there could be wide ranging problems throughout the system.

1.5. Explain **how** the team determined both customer satisfaction and dissatisfaction

The VoIP Team conducted personal interviews with 30 random sampled Phase II VoIP customers. The customers were questioned about satisfaction at three distinct rounds during the implementation. First round when they started using the new phones, second round immediately after the first week of use and the third round after having been provided training on the new system. The Phase II VoIP users had a learning curve to overcome which tended to last for about a week. At first the new VoIP phones had network connectivity issues or network configuration problems that had the effect of making the new technology cumbersome. During the first round the customers scored 40% satisfied (12 out of 30), after using the new phone for a week customers scored 70% (21 out 30) satisfied and after training, customers scored 97% (29 out of 30) satisfied. The VoIP Team received this information directly from the customers.

Category 2 - Process Management

2.1. List the process(es) applicable to the team purpose and performance expectations

The focus of the VoIP Telephone Team process management was two fold: first using a within budget plan that included the Return on Investment requirement. The budget was developed with equipment and labor quotes plus factoring in installation scheduling with the customers as part of the time component to the budget. The Statewide VoIP Project was projected to last for 12 months but was completed in only 10 months. The Team was expected to ensure the Statewide VoIP Project budget, and that the Return on Investment was adhered to. Secondly, there is a centralization process of the system wide management and coordination of both PBX and VoIP phone systems ensuring better customer service with faster response and coordination of efforts. The performance expectation for the Team was to centralize maintenance and management of PBXs and VoIP Network infrastructure within 12 months from the start of the Statewide VoIP Project. Using the centralization process the Team was able to streamline the installation schedule which resulted in an accelerated Return on Investment per year from the projected \$403k to \$445k per year.

2.2. Describe the steps taken to achieve the purpose of the team

A feasibility Pilot Project was conducted to evaluate two different solutions for Statewide Network connectivity using VoIP technology. The criteria for the best solution was based upon implementation costs, upgrade costs, maintenance costs, Return on Investment and robustness and survivability of the system. While both solutions leveraged the existing PBX's and both provided toll quality voice there were major differences. Solution #1 had no central management features, would require expensive additional hardware, an expensive "upgrade" to be performed to each PBX, a maintenance program based upon the expensive "upgrades" and an initial cost of \$1.3M. Solution #2 provided a centrally managed call handler, no PBX "upgrades", a clear path to provide scheduled maintenance and Time and Materials (T&M) and a projected budget of \$1.1M. After Solution #2 vendor was awarded the Statewide VoIP Project, a projected budget plan was conceived in cooperation with the vendor that was based upon a fixed budget amount. After significant negotiation with the vendor a budget plan was developed that was considerably less then the projected budget amount. The Return on Investment was calculated based upon data received from Verizon and AT&T and the total implementation cost. The data included long distance, local line charges and Messaging unit costs that SHA had incurred over the previous year. The initial Return on Investment was projected to take 2.76 years at a rate of \$403K a year with a budget of \$1.1M. Also as the technical installation got underway the customer requirements and Team processes started to be defined in maintenance, installation and configuration strategies.

2.3. Explain how the steps taken to achieve the purpose of the team affected efficiency, effectiveness, quality, and/or customer satisfaction attributes

With the budget plan and Return on Investment firmly set, procurement of equipment and labor was authorized and installation was scheduled. The initial Return on Investment was used as the benchmark for the project to follow. The Statewide VoIP Project was completed at 19% under budget, 2 months ahead of schedule and the Return on Investment was realized in just 2 years. This was accomplished by negotiating with the vendor for the deliverables of the quote which affected the cost. A vigorous installation schedule which brought facilities into the VoIP Network sooner affected the Return on Investment timeline and the Toll Bypass strategy turned out to be more effective than originally planned. Quality for the Phase II VoIP Project customers improved as a result of refining the harmonization between customer and technical requirements so that the customers understood better what the system could or could not provide as this became an emphasis within the training sessions.

2.4. Explain how the team gathered data, analyzed it, and the tools used to make decisions

2.4.a. Explain how you gathered the data and how you analyzed it.

The VoIP Team had been provided data for the projected Return on Investment based upon Verizon's Projections of SHA's AT&T Long Distance and Verizon's Local Access phone bills. The total implementation cost was scrutinized very closely in order to produce savings but not cut intended service. This was done by direct comparison of different implementation plans offered within the feasibility Pilot Project. Once the total implementation cost was decided upon and the installation schedule projected, the initial Projected Return on Investment was calculated.

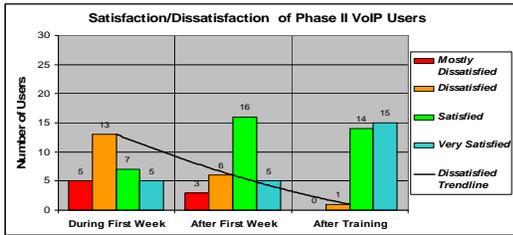
2.4.b. Identify the tools you used from this list: Pareto Chart, Flowchart, Cause and Effect Analysis, Check Sheet, Control Chart, Histogram, and Scatter Diagram

The VoIP Team used a Check Sheet to track the responses of the customers in order to capture problems associated with new technology usage. Comparative Analysis and a spread sheet were used to calculate the Return on Investment and associated factors of installation timeline, Toll Bypass strategy and implementation costs.

Category 3 – Results (this section is worth 450 of 1000 point total) Provide one page of graphical results

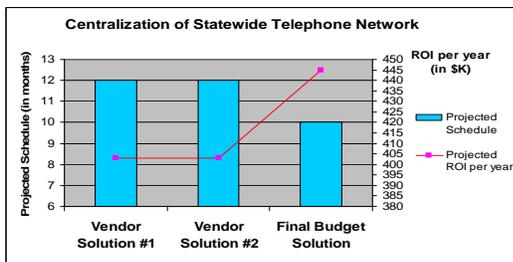
3.1. Provide current levels and trends for customer satisfaction **and** dissatisfaction

A sampling of 30 Phase II VoIP customers was conducted at three separate times: during one week after implementation, after one week of use and after Training was provided. The chart clearly shows the levels of dissatisfaction declined to near zero after Training and the level of satisfaction increased to 29 out of 30 customers.



3.2. Provide current levels and trends in key measures or indicators for the process(es) listed in Category 2 above

This chart shows how the Centralization Process affected the projected Return on Investment per year timeline. Proposed Vendor Solutions #1 and #2 both had an implementation timeline of 12 months and the Final Budget Solution had a timeline of 10 months. This affected the how quickly PBX's could be connected to the Network thereby avoiding Toll and usage charges on leased Telephone Company services.



3.3. Provide current levels and trends in key measures or indicators of effectiveness, efficiency, and/or quality

This chart shows how effective the Final Budget was in producing an efficient Return on Investment as compared to the proposed Vendor Solutions #1 and #2. The Return on Investment on the Statewide VoIP Project was realized in just 2 years as opposed to the 2.76 years from Vendor Solution #1 and 2.7 years from Vendor Solution # 2.

