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Ross Group Inc

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[IT CONSOLIDATION STUDY]

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Building an IT operation that can perform the services provides an increase in levels and quality of services above that currently enjoyed by any of the entities today. It can do so at costs less than any of the five entities buying or building comparable services themselves.

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Solutions for a Data Intensive World

Executive Summary

This report is the deliverable of the North Central Ohio project to evaluate sharing of Information Technology (IT) services among five government entities: the NCOESC, City of Tiffin, Seneca County, Clinton Township and Village of New Riegel.

In this project surveys were performed of leadership, personnel, systems and finances of the five governments as they relate to IT.

The analysis of this data indicates that sharing of IT resources among these five governments is less a merger of current operations and more a building of an IT operation that can offer services – at varying levels – to the five entities, or to departments within the five entities.

Building an IT operation that can perform the services provides an increase in levels and quality of services above that currently enjoyed by any of the entities today. It can do so at costs less than any of the five entities buying or building comparable services themselves.

A critical mass of dedicated IT professionals is required to provide standards-based, high quality, maintainable processes and services. There are insufficient dedicated IT personnel to provide IT planning and strategy, technology planning, project management or process management in any single one of the entities today.

A phased implementation – each phase increasing the number and complexity of services offered – will be required based on availability of funds.

Contents

Executive Summary 2
Introduction 4
The Study's Project Plan 5
The Ross Group Consultant Team 5
Public Performance Partners 5
The Surveys 6
Interviewing Leadership 7
Summarizing Leadership Interviews 10
Interviewing IT Personnel 12
The IT Questionnaire 12
Summarizing the IT Interviews 15
IT Infrastructure Service Management and Operations 24
The Financials 25
Summarizing the Financials 26
Analysis 27
Organizational Analysis 27
The Impact of IT on Innovation 27
Infrastructure Analysis 27
Services Analysis 31
Key Findings 34
Key Recommendations 38
Discussion of Recommendations 40
Proposed Organization Structure 40
Roles and Responsibilities 41
Gap Analysis 42
Implementation 43
Summary 45
List of Appendices 46

Introduction

Government organizations, specifically local governments, face the issue of tight budgets and increasing demand to communicate with and support the activities and needs of their citizens, organizations and private enterprises. Communicating with and supporting their constituents requires levels of information technology sufficient to provide, and gather, information to and from a populace increasingly demanding electronic access to information and transaction support. Further, the demand on government services requires an efficient a means as is practical to process and provide those services. Providing Information Technology (IT) solutions to address these needs is both sensible and in the long-term the only practical way to accomplish the servicing of demands on government, communicating, and providing transactional support.

Information Technology (IT) solutions range from simple to very complex (and expensive). At minimum, the challenge for local governments is to build those solutions adequate to the needs, expandable to anticipated near-term needs, and on a path that is sufficiently flexible, rigorous and avoiding dead-ends that require expensive wholesale replacement of failed or inadequate solutions. A higher goal is that IT based solutions drive efficiencies, cost savings, and higher levels of service through all of the departments that the solutions support.

The State of Ohio has encouraged local governments within the state to examine opportunities to pool resources, to consolidate IT expenditures and provide greater levels of service at lower costs than the costs to provide the same level of services if each local government secured or built those services themselves.

North Central Ohio regional governments engaged a study to evaluate IT resources within their government operations seeking improvements in costs and improvements in levels and types of service through sharing or consolidating the resources of the five entities. The North Central Ohio project to evaluate sharing of Information Technology (IT) services among five government entities: the NCOESC, City of Tiffin, Seneca County, Clinton Township and Village of New Riegel is the basis of this report. These five local government entities are each a part of North Central Ohio Regional (NCOR) – a coalition of regional governments.

Public Performance Partners and Ross Group Inc were engaged to perform the study. Hugh Quill of Public Performance Partners and John Lynch of Ross Group Inc were project managers for the project.

The Study's Project Plan

The Project Plan is presented here in Gantt chart format. This summary presentation is of the three main phases of the project: information gathering, analysis, and reporting. The expanded project plan, with further detail of each of these phases is provided in the appendices. This report describes the information gathered, our analysis, and draws recommendations from that information and analysis.

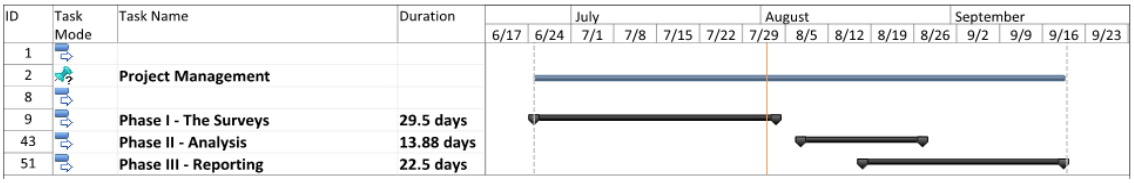


Figure 1 - Project Gantt chart - Summary

The project began with minimal resources (two people) in late June, 2012 with meetings of the Project Managers and key leadership of NCOR and NCOESC, and a brief introduction at a regularly scheduled NCOR meeting.

The resources assigned to the project increased through the surveys phase and continued during the analysis phase, declining slightly during the reporting phase. Status was reported early in August for the project through July, and key deliverables (key findings and the final report) were delivered on the targeted and committed dates (mid-August and early September respectively). The project was conducted with project management principles according to the Project Management Institute (PMI) and was completed on-time, and on-budget.

The Ross Group Consultant Team

John Lynch, MBA, PMP - Project Manager and Lead Consultant
Joe Linahan - Senior Consultant
Steve Woody - Principle, Ross Group Inc
Bailey Glenn - Network Consultant
Joseph Cuesta - DBA Consultant
Scott Foulk - DBA and Infrastructure Consultant
Gary Codeluppi - Principle, Ross Group Inc

Public Performance Partners

Hugh Quill, President and Principle

The Surveys

Four information gathering processes were a part of the "Surveys" phase of the project. The intent of the four processes was to provide overlapping views of the IT resources currently committed in each of the five government entities. The four processes and methods of gathering information were:

1. Leadership interviews – helps gather expectations and unmet needs as well as leaderships' views on existing IT operations;
2. IT Personnel interviews – helps measure existing activities of personnel, current systems and issues, and organization structure;
3. IT Assets review – location and use of key IT infrastructure (servers, network, software); and
4. Financial Review – budgets and expenditures.

Each of these views, or "lenses", provides a different angle to help assess the whole of IT operations within each of the five entities. This methodology (four lenses) was selected to ensure that the information gathered and the insights gained do not suffer from the shortcomings of any one or two of the methods. By looking at finances we can pick up on an aspect of the IT resources, such as maintenance contracts, that might not have been visible in interviews or examining computer rooms. Similarly, meetings with leadership can bring out unmet needs not detected through looking at the finances or listing the systems. Each of the methods complements the others.

In our view, this methodology provides relatively comprehensive pictures of the IT resources, needs and uses in a relatively fast and inexpensive procedure. The methodology is somewhat time expensive on the part of those interviewed, but perhaps less so than other methodologies. Our thanks go to those who provided their time and efforts in responding to iterative requests, calls and meetings.

Interviewing Leadership

The leadership involved in this study:

- Dr. James Lahoski, CEO and Superintendent, NCOESC
- Aaron Montz, Mayor, City of Tiffin
- Debra Reamer, City Administrator, City of Tiffin
- Stacy Wilson, County Administrator, Seneca County
- Jim Distel, Trustee, Clinton Township
- Larry Bouillon, Mayor, Village of New Riegel

It should be noted that this selection of leadership is not all the leadership within the five governments, nor are they Information Technology leadership. Addressing this concern, the Project Managers note:

- For NCOESC, Dr. Lahoski is the CEO and Superintendent and represents the requirements and issues of the organization well. Kathy Mohr, Director of the IT organization within NCOESC provided much of the information on the systems and personnel within NCOESC. Rhonda Feasel, Treasurer NCOESC provided financial information.
- For Seneca County, Stacy Wilson is the County Administrator. We did not meet with the County commissioners, either individually or as a group. The county is a complicated organization as the Courts, the Sheriff, the Engineering Department, and Job and Family Services each have their own IT resources and for a variety of reasons are not participating in consolidation or sharing arrangements. There is no centralized IT department or manager of IT resources. Ms. Wilson provided coordination to other departments through email and phone conferences.
- For the City of Tiffin, Aaron Montz, Mayor; and Debra Reamer, City Administrator provided leadership insights. The IT resources of the City are decentralized. A significant portion of the City's IT requirements have been assumed by NCOESC, and Kathy Mohr (of NCOESC) was able to provide some of the required IT insight. Interviews with City IT personnel provided additional information.
- For Clinton Township, Jim Distel, Trustee provided an overview of the township's needs and existing systems. Much of the township's processing is provided through remote access to state systems.
- For the Village of New Riegel, Larry Bouillon, Mayor provided an overview of village's needs and existing systems. Much of the village's processing is provided through remote access to state systems.

The leadership of the excluded departments of Seneca County and the City of Tiffin were not included in the leadership interviews. Given presumptive decisions about whether these departments may perceive some benefits short of full participation in

sharing IT resources it is regrettable that not all of the leadership could be included, however those interviewed provided the necessary information for the organizations actively considering IT consolidation.

The purpose of these interviews was to evaluate the need for IT from the perspective of leadership. The interviews took the form of unstructured, open-ended questions allowing the interviewer to solicit information based on the interviewees' reactions to the questions and discussion. This format allowed pursuit of information that the interviewer may not have previously thought to ask based on the interviewees' responses. Six open-ended questions were prepared and given to the interviewees at least a week prior to the scheduled interviews.

The questions:

1. What are your expectations for "Consolidated IT"?
2. What are expected benefits?
3. What are anticipated difficulties?
4. What systems are presently supporting the department?
5. What are unmet IT needs?
6. What foreseeable increases or decreases in IT requirements are visible on a short-term (three-year) horizon?

The leadership is from very differently sized entities. The views of the larger entities are very different from those of the smaller.

Question 1: Expectations

For the City of Tiffin and the NCOESC, Mr. Montz and Dr. Lahoski expressed mostly common expectations: to save money and increase basic levels in standards of equipment and systems.

Dr. Lahoski also spoke of providing a basis for the local governments to extend their sharing agreements in whatever form they may take to include other governments in the region, providing a basis large enough to provide critical services which the other governments might not be able to reach themselves.

Mr. Montz spoke of the need to meet current standards of hardware, software and processes across the departments of the City – speaking in terms of the minimum levels a corporation would expect of IT, and how the City should at least meet those standards in terms of currency of hardware, basic software and networking.

Seneca County's Stacy Wilson had lower expectations, concerned that any single sharing agreement would receive backing within the various departments and groups

within the County. It was not clear how such sharing agreements would work for the county given the variety of decentralized decision makers and diverse IT systems implemented. Arrangements within the various departments, many using outside contractors, contribute to the difficulty of common solutions being reached.

The Village of New Riegel's Mayor Bouillon focused on saving expenses and getting visibility and access to funding sources to assist in getting some basic services for the Village.

Clinton Township's Jim Distel didn't expect much from consolidating IT as they have little there to consolidate.

Question 2: Benefits

Common to all of the leadership was cost savings.

NCOESC and the City of Tiffin look for upgrades in hardware, software, and systems.

Seneca County thought there might be some savings in leveraged purchasing.

Clinton Township and the Village of New Riegel both look for basic IT Services (web presence, email) and access to services beyond their individual fiscal reach.

Question 3: Possible Difficulties

Getting buy-in among the governments and within the governments to departmental levels of users and decision-makers was the most commonly expressed difficulty. Whether this difficulty was expressed as "turf issues", individual identity and control, or reluctance to change the way it has been done in the past – the potential of sharing resources will meet resistance.

Dr. Lahoski of NCOESC also spoke of leadership challenges; the need to recruit and continually develop management and leadership within the organization to manage and lead as both this change and anticipated changes due to continued growth demand.

Question 4: Systems

From the perspective of leadership, there were significantly different views of the systems in place and those required.

NCOESC has systems providing services for schools – both public and charter.

The City of Tiffin and Seneca County have diverse systems supporting Courts, Police (or Sheriff), Engineers, and Finance.

The Village of New Riegel and Clinton Township's systems are just those to link to State provided payroll and tax services, and commercially available email and web services.

Question 5: Unmet Needs

Online forms processing is a common and unmet need.

For Clinton Township, this might be as simple as online forms available for the township residents to download (for local printing and submission in paper) or for the City to accept online payments of fees with applications.

Web presence, including online calendars of events, and links to County web sites was requested.

Question 6: Short-Term Increases or Decreases in IT Requirements

NCOESC forecast significant and continued growth – both in its currently obligated path of supporting schools, specifically in its program to support charter schools; and in its vision of growing any shared services agreements to include other government entities.

The City and County forecast growth within normal bands for their respective governments – neither expect growth nor decline beyond that demographically dictated.

Clinton Township and Village of New Riegel provide no forecast.

Summarizing Leadership Interviews

The leadership interviews are insightful both as one-on-one views of the requirements and challenges; but also as a first cut at the aggregate requirements and challenges.

The first view of aggregate requirements and challenges begins to emerge from these interviews and are:

- All of the entities expect to see cost savings, and such saving are expected to take the form of:
    - Shared and leveraged purchasing of equipment and software.
    - Use of commonly purchased systems such as email, web-services and basic infrastructure including back-up/restore, virus protection and disaster recovery.

    - For the larger entities, shared personnel; where support and operations personnel can be afforded by each participating entity contributing a portion of personnel expenses sufficient to reach full time and dedicated personnel, who are then able to be recruited or developed into expertise of the given subject matter.
- All of the entities hope to see some standards and are willing to be guided in standards. The evaluation and selection of standards is generally not currently done as it is too expensive to be done at individual decision-maker levels and too involved at individual decision making points.
- The smaller entities' requirements are significantly different from the larger entities. Further, within Seneca County, and perhaps also the City of Tiffin, there are departmental level decisions as to whether or not to participate in IT resource sharing. This suggests agreements based upon service levels and requires the definition of service levels for differing services which can then be the basis of exchange – the thing a given entity "buys" when entering into agreement. The form of the sharing agreement(s) varies by entity, and perhaps by department within each government entity.

Interviewing IT Personnel

The interviews with the IT personnel were scheduled, with the assistance of Kathy Mohr of NCOESC, as one-half hour in-person sessions. Each session was conducted by a Senior Consultant from Ross Group Inc, John Lynch or Joe Linahan. In the case of the interviewees who were key users of information technology, but whose primary responsibilities was functional, the questions were focused on what technologies they used, who supported them, how much time they spent in IT activities versus their functional jobs, their satisfaction with the current products and what they saw as opportunities for improvement.

Consistent findings from all functional areas are:

- All use some version of Microsoft Office. Versions varied within and across departments.
- PC Operating Systems were Microsoft, but versions varied within and across departments.
- Hardware was of varying age, but most was older than 3 years.
- Email packages varied by department.

For those at NCOESC whose jobs are IT the structure was: a brief explanation of the nature of the interview, a period where the interviewee filled out a structured questionnaire, discussion of the responses to the questionnaire, and an open-ended discussion about the nature of their position and the systems they worked on, used or supported.

Activity, Task or Role of employee
Support
End-User PC Office type application support
End-User PC operating system or network support
End-User PC support other
End-User PC Maintenance
Instruction or Training (on PC operation)
Application support: configuration changes
Application support: report changes
Application support: data cleaning/normalizing/entering
Application support: other
Application Maintenance
Database Support
Database Maintenance
Network support: configuration/changes
Network Maintenance
Network Other
Operations
Schedule/Run/Verify running of application(s)
Distribute reports/mailing from application(s)
Data Entry/Verification/Correction
Operations: Other
Development
Design Develop
Test / QA
Install
Support
Other
Other IT Related
Other Activities, not IT related

The IT Questionnaire

All of those interviewed had been informed of the purpose of the interview beforehand The purpose of these interviews was to determine, approximately, the nature of the work currently being performed by the personnel as expressed in an “average of”

hours per week spent on support, development, operations, or other IT or non-IT functions. Further, the interviews sought to develop an understanding of the systems used in each department.

Of the number of people interviewed (or represented), six were full-time IT staff, three were people who spent part time in IT related functions and the rest in functional areas, and three who were primarily responsible for other activities but who are key users of specific application systems. Those who are key users do provide support as needed to others for their specific functional applications, but this time is variable and is not included in the support counts below.

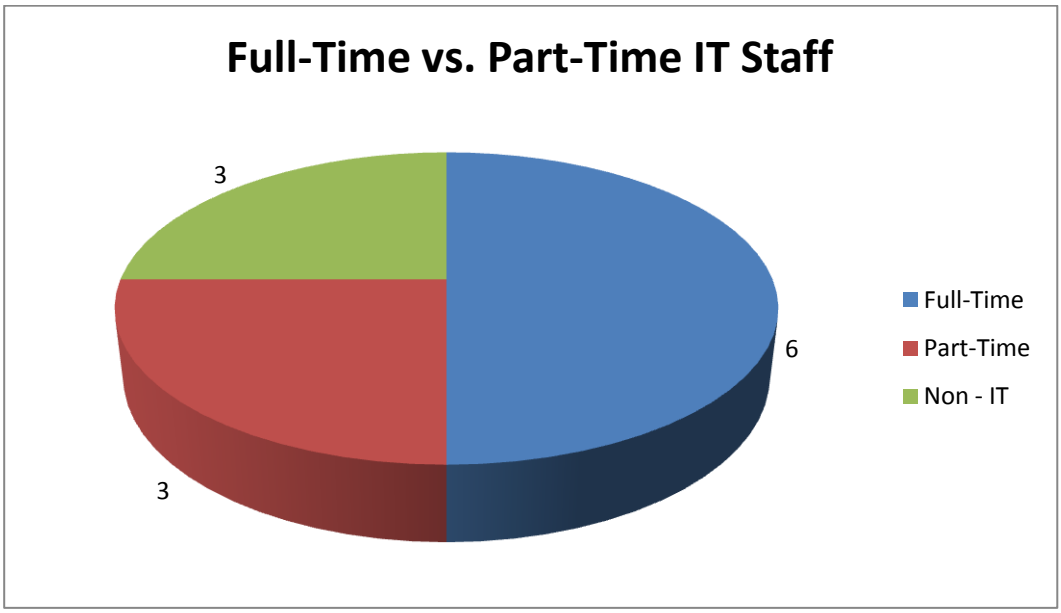


Figure 2

The hourly estimate data resulting from the interviews was normalized to a forty hour work week and tabulated. This includes those whose primary role is not IT, but who do spend at least 10 hours a week in an IT related function. See Figure 3.

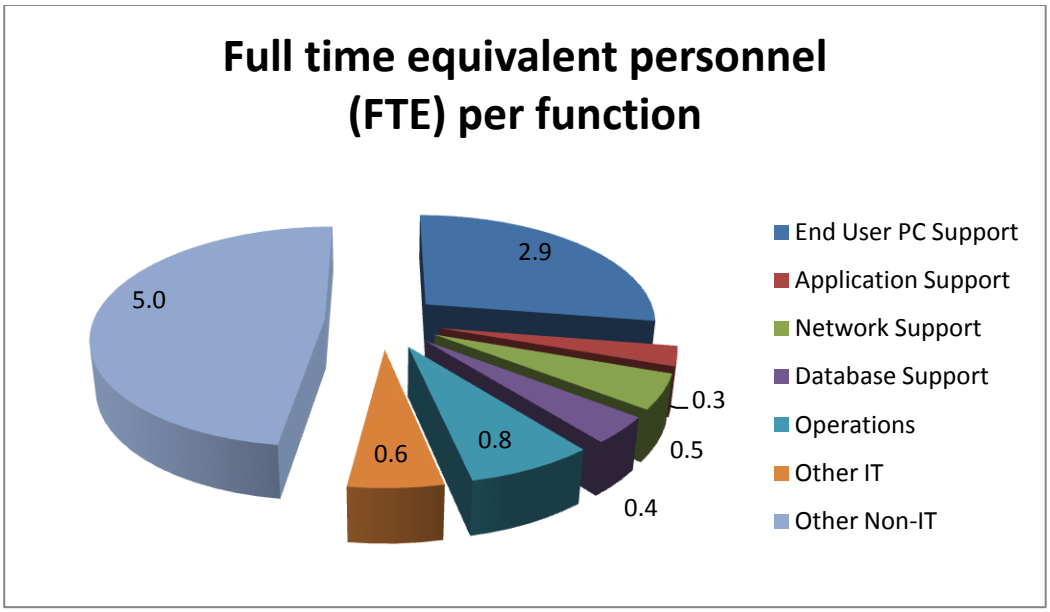


Figure 3

The twelve people represented described the time they spend in each of the major functions. During the interview portion, we gained further insight: Those who consider themselves in support of an application count some portion of their time participating with the source of their application(s) and term that time as primarily support time. While true, such probably overstates the amount of resource actually performing support.

This same insight also applies when we break out the largest segment: support - into constituent components: End User PC, Application, Network and Database (see figure 4). In the breakdown of type of support the largest single amount of time spent was "End-User PC Support". During the interviews, again we find personnel who are doing primarily application functions count some of their hours spent as supporting end-user PCs. At least some portion of this was due to the fact that the end-users access their application from their PCs. Thus, the "End-User PC Support" time category is not necessarily PC support in terms of "is it running? (the PC)" but some portion of "how do I do this?" - meaning "how do I run this application?".

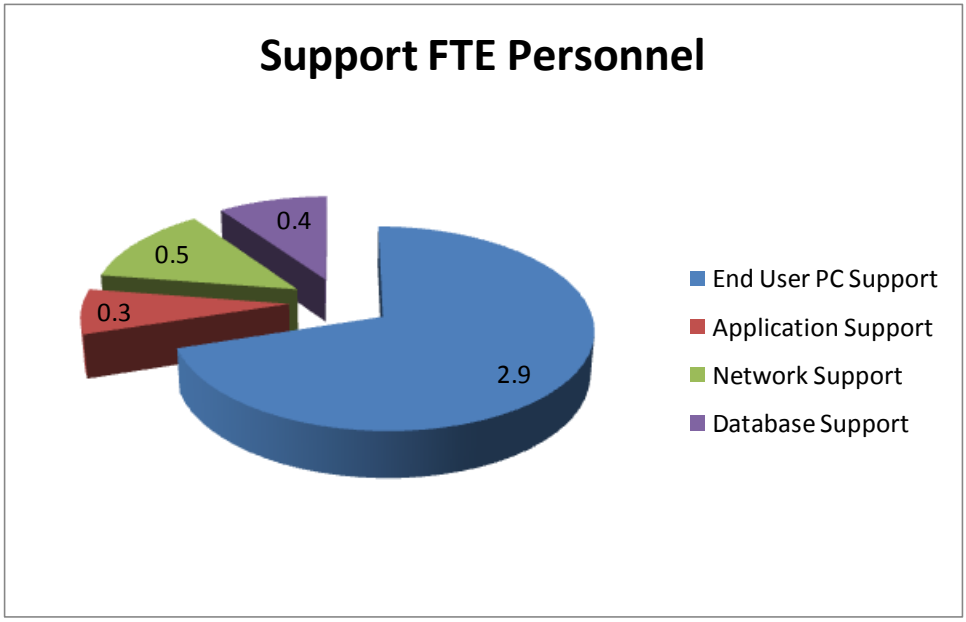


Figure 4

Summarizing the IT Interviews

The interviews provided data on how the employees are currently spending their time. It is an approximation, as the method used (interview) did not involve actually observing how each individual's time is spent, but is self-reported and subject to some amount of guessing on the part of the interviewee, and on the interviewer to interpret it. For the purposes of estimating headcount and current IT involvement role of each employee, it should be sufficiently correct.

It should be noted about half of the individuals interviewed as "IT personnel" were really end users of IT who also performed some level of support for their primary applications.

To be discussed, but not covered here is the issue of how time should be spent. This analysis focused on how time is being spent and provides a low disruption path to transition to a new organization by assuming that most people will be doing mostly the same functions as before. Is that a good assumption? There will be additional discussion on that point in the findings and recommendations portion of this report.

These interviews were not intended as assessments of the individuals, their competencies, or their performance levels in their current or prospective positions.

A consistent theme among all interviewees was a need for consistent, up-to-date hardware and software which would provide for faster, more efficient operations and improved ability to perform their jobs.

Appendix I is a list of those interviewed.

Surveying IT Infrastructure and Assets

The IT infrastructure of the five entities is concentrated in a central facility for NCOESC and the withheld organizations of Seneca County Courts, JFS and County Engineers. The remainder of the IT infrastructure is servers, network and PCs co-located within the various departments of the City of Tiffin, County departments, Clinton Township and Village of New Riegel. IT inventory numbers were accumulated by collecting spreadsheet information from each site updated by the IT manager or IT staff from each location. In addition, an on-site visit by Ross Group Inc (RGI) technical staff at the NCOESC and City of Tiffin occurred on August 3rd. Kathy Mohr, the Director of Technology/Professional Development NCO Educational Service Center provided in-depth information to Ross Group staff for the NCOESC as needed.

The NCOESC, having the largest ownership of IT assets, has a formal IT department and facilities for hosting. The State also provides a server and services for SIS and fiscal issues. The City of Tiffin has the second largest amount of IT assets and has IT staff embedded within the functional departments of the city such as the Finance department, Tax department and Fire department. Seneca County comes in third in size of IT assets and has department-level IT resources. Clinton Township and the Village of New Riegel are at the bottom relating to IT asset count. See TABLE 1 and CHART 1 below for visual summaries. Please note that the totals may be subject to change based on asset information that was not listed or possibly listed incorrectly in the IT asset spreadsheet provided for counts.

The physical facility at NCOESC appears to have sufficient space (in the room and within existing server racks) to hold most, if not all, of the systems that can be moved from current locations (The Clinton Township server, various departmental servers within Seneca County not withheld, and various City of Tiffin departmental servers not withheld) if such transfers utilize (new) virtual servers added to the existing racks. Physical security at NCOESC requires some level of upgrade to accommodate security requirements of the shared facility. Consideration for an appropriate sized generator would be beneficial in case of a prolonged power outage. In addition, the current firewall is a software based firewall that came with the phone system. It was converted to handle all internet traffic. The firewall was developed to handle phone traffic and not internet traffic. Moving forward with consolidation efforts, the need to invest in a hardware firewall appliance that is built to handle all traffic would be optimal. A few enterprise level firewall products include Cisco ASA and Fortinet FortiGate.

The network infrastructure among the entities primarily uses Time Warner Cable (TWC) services at various bandwidths. Cable networking does not provided dedicated bandwidth in that it is shared with other network users. The current network infrastructure is listed below:

- NCOESC: Time-Warner Cable (TWC) 25Mbps connection which has started to max out.
- Seneca County: 10Mbps P2P TWC connection back to the Tiffin Office which seems sufficient now, but they may need to increase the bandwidth plan in the future.
- City of Tiffin: 5Mbps TWC connection using it as their ISP. It's bottlenecked all the time and needs more bandwidth.
- Clinton Township: 5Mbps TWC connection.
- Village of New Riegel: No known permanent internet connection.

Moving forward with the recommended consolidation at the NCOESC hub, future network bandwidth capacity is most important as expansion of IT processing and Web services expands. The current NCOESC TWC 25Mbs is starting to hit capacity and as stated previously, cable networking does not provided dedicated bandwidth since it is shared with other network users.

There may be the potential to upgrade to TWC 50Mbps or even 100Mbps which could provide extra bandwidth. However the long term strategy and solution should be to tap into the fiber network. Currently AT&T does provide fiber services in the Tiffin area. An example of a 36 month term 10 Mbps usage fee would be $997.55 per month. While more expensive than cable, fiber is totally dedicated and not shared. Fiber provides transmission at higher bandwidth and data rates than cable. Utilizing fiber will not limit future network growth or expansion and fiber will meet emerging technology network requirements more efficiently. In addition, the City of Tiffin could also integrate fiber to meet its current bottlenecks but could also take advantage of upgrading to TWC 10Mbs for immediate help.

The IT infrastructure for the future should focus on a continued path toward IT optimization, enterprise interoperability and reduction of infrastructure complexity which will result in economies of scale and cost reduction. This follows closely with the strategic path that the State of Ohio IT is moving towards. The State has developed an IT Optimization Strategy for its infrastructure future – *Reduce Infrastructure Complexity – simplifying the infrastructure reduces cost and provides a foundation for common, enterprise applications and solutions*[1].

Please note that the Tables include all assets for the entities including those that are not part of the consolidation to provide a complete inventory list.

[1] Ohio Dept. of Administrative Services Office of Information Technology (OIT) 2011 Accomplishments, page 1. http://das.ohio.gov/LinkClick.aspx?fileticket=Ki7AWcD1qgI%3d&tabid=79

TABLE 1:

Servers and Network Equipment

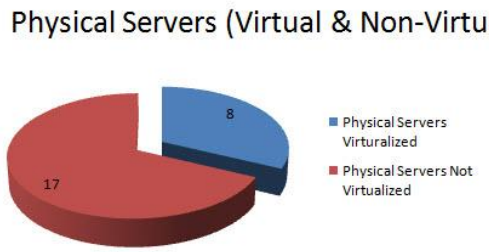
	NCOESC	Seneca	Tiffin	New Riegel	Clinton	Schools - Other
Physical	15	8	12	0	0	2
Virtual	19	0	3	0	0	0
Database	4	1	0	0	0	0
Email	1	2	0	0	0	0
Application	7	3	2	0	0	0
Web	2	0	0	0	0	0
Test	2	0	0	0	0	0
Backup	3	0	0	0	0	0
Domain Controllers	9	1	3	0	0	0
DNS	2	1	0	0	0	0
Network Equipment	2	9	30	0	0	6
Phone	4	0	0	0	0	0
Total	70	25	50	0	0	8

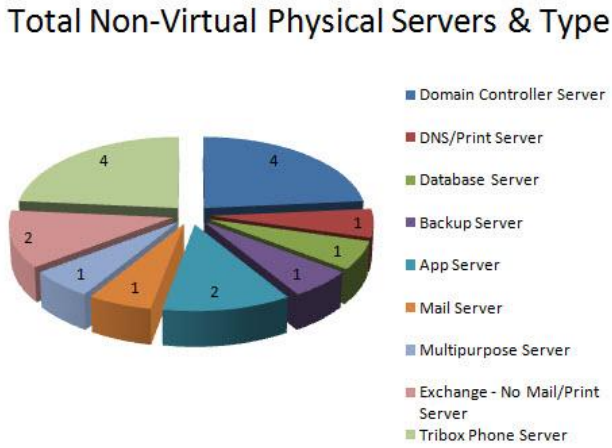
Workstations and Printers

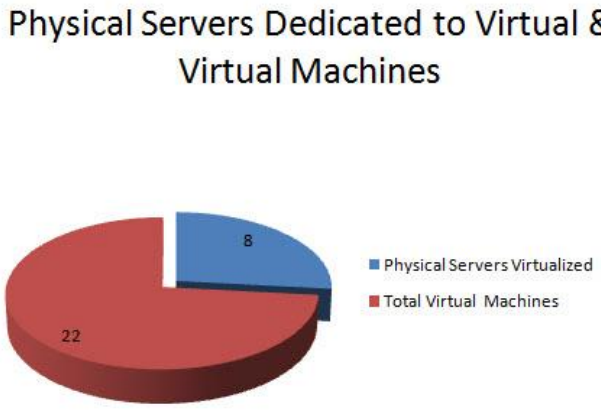
	NCOESC	Seneca	Tiffin	New Riegel	Clinton	Schools - Other
Workstations/Laptops	308	102	105	2	1	532
Printers	34	32	23	3	0	93
Total	342	134	128	5	1	625

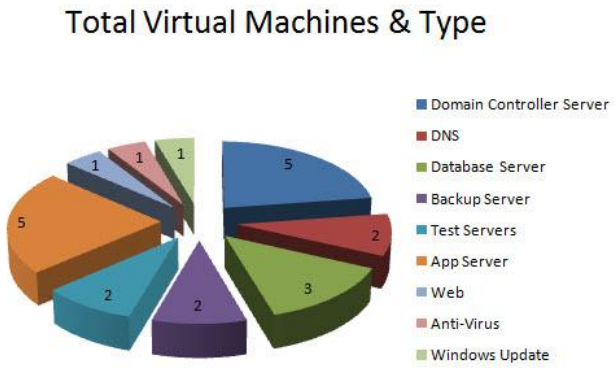
CHART 1

Please note that the charts include only those assets that are already consolidated and those within the scope of entities to be consolidated.









The next sections include topics on various IT infrastructure analyses. We reviewed what the IT baseline essentials existed for the combined entities. These essentials included the following:

A. Virtualization
B. Email Domains
C. Anti-Virus
D. Help Desk
E. Backup/Recovery
F. Disaster/Recovery
G. Database Utilization
H. Cloud Computing
I. IT Infrastructure Service Management

In addition, the "Surveying IT Infrastructure and Assets" section discussed previously provided additional information on the NCOESC physical facility and several security related issues.

Virtualization

There are 22 Virtual Machines/Servers established on eight physical servers at the NCOESC (includes embedded City of Tiffin) which meets today's standards for the maximum usage of each physical server. The virtual servers are virtualized using VMware ESXI software which is the market leader for virtualized software. There are two physical servers where there is only one virtual machine/server and it is assumed that these virtual servers were created in anticipation of additional virtual servers being added later to physical servers. There are eight non-virtualized servers providing

less CPU processing power making it harder to virtualize multiple applications or software. The remaining entities (Seneca County, Village of New Riegel, and Clinton Township) in the study are not utilizing virtualization mainly due to the compartmentalization of different departments and lack of IT support to provide an integrated solution.

As future NCOESC server processing power and storage growth requirements expand, the ongoing implementation of Virtualization practices continue to be necessary. Implementing one or two high powered servers to replace the eight servers not virtualized may be an option for future ROI. Seneca County would not benefit from Virtualization since each server is located in a different department making it more cost prohibitive. The City of Tiffin, for those departments not supported by the NCOESC, could benefit and get ROI from Virtualization solutions if they were able to consolidate their legacy servers to a larger server. However, a consolidation project would be a significant undertaking.

Email Domains

The current email infrastructure of the five entities consists of various flavors of mostly non-enterprise level systems. NCOESC uses OpenText FirstClass mail and has been running that product for a while. FirstClass does provide more interoperability than some mail solutions but does not provide the enterprise level features that Microsoft Exchange provides, for instance. The NCOESC recently tried to migrate to Gmail but abandoned that effort after four days due to various difficulties.

The various email systems for each entity in the study is listed below:

- NCOESC, Tiffin and all affiliated sites use OpenText FirstClass
- Clinton Township uses Gmail cloud email with no interoperability options.
- Seneca County uses a mixture of Internet Service Providers (ISPs) and MS Exchange for calendar only. This provides no interoperability options. Those areas not in the shared services scope use MS Exchange – Prosecutor's office; Linux based email server – Juvenile/Probate court.
- Village of New Riegel uses no email

Anti-Virus

Although anti-virus is only one of several security requirements within IT domains, it is an important one. Robust anti-virus software prevents most types of viruses, malware, RAM-scraping, trojans, worms, and other malicious software. Regular patch updates reduce vulnerability gaps. The NCO five government entities provide a loose coupling and mixture of security software, protections and data assurance. For example, installs of anti-virus are listed below for the entities in the study:

- ESC uses Sophos endpoint protection
- City of Tiffin uses AVG, Trend Micro or nothing on remaining hardware/workstations
- Clinton Township uses free open source antivirus
- Seneca County uses AVG, MS Security Essentials (freeware), Sophos, and VIPRE
- Village of New Riegel uses some free open source antivirus or nothing on remaining hardware/workstations

Asset Management, License Management and Compliance

Currently, NCOESC utilizes a custom built inventory tracking application that was created in a FileMaker database. This application and database provides a way to keep track of hardware assets and attributes that are physically located at various sites but all information needs to be manually updated into the tracking system. NCOESC does not have a robust asset management, license management or compliance tracking system.

Help Desk

Current helpdesk support at the NCOESC uses an internally developed FileMaker Pro application that tracks help desk tickets created by several of the IT support staff. None of the other entities use this system and restricted to only the staff that has access to the application.

Backup/Recovery and Disaster/Recovery

Common standard practices of backup, restore, records retention and disaster recovery are in place at NCOESC. The NCOESC is currently using Symantec Backup Exec Continuous Protection server version 12 to perform their backups. The Backup Exec Continuous Protection Server (CPS) uses continuous file-based replication combined with periodic snapshots of data to deliver continuous protection. It creates copies of source files from one or more source servers to a backup destination folder on a Continuous Protection Server. Seneca County is also using Symantec's Backup Exec and does a full backup to tape nightly. These tapes are then taken offsite for storage. Each department monitors their own backups and processes.

Based on interviews with Tiffin department heads, each department in Tiffin also appears to have their own process for backup and where they store the backups. We asked several staff, but no one had tested or tried a restore. Both Clinton Twp. and the Village of New Riegel do not perform backups based on our assessment. If they perform something behind the scenes, then the backups would be highly suspect.

For disaster recovery operations, NCOESC transfers real-time data to a group of locations throughout the county. The other agencies either take a tape offsite or ship their tape to the ESC to hold. The delay would be in getting the tapes back on site and hoping that the tapes function. There appears to be no disaster recovery procedure for New Riegel which has only one workstation.

Database Utilization

NCOESC primarily relies on four FileMaker Server databases currently running on versions 6 Standard Server, V8.5 Advanced Server, and V10 Advanced Server. They are planning to be upgraded to version 11 soon with version 12 being the latest version.

The FileMaker suite comes with its own application development tool named FileMaker Pro that interacts with the FileMaker databases. The current FileMaker Pro application clients are running with versions 5.5, 10, and 11. The ability to utilize Rapid Application Development (RAD) provides some short term benefits using FileMaker Pro. There are approximately 250 client licenses that were purchased under the education discount through Filemaker and CDW-G.

Most of the NCOESC employees are users for various types of application functions. The public uses FileMaker Pro web access provisions to view and print government documents and forms which are stored in the FileMaker databases. There also is one SQL Server database used for specific projects (e.g. Moodle and A+ Curriculum).

Seneca County, Clinton County, City of Tiffin and New Riegel did not show any major databases in the inventory listings.

Cloud Computing

The emergence of Cloud Computing within the last five years has come to the attention of businesses and government organizations everywhere. It has become a strategy to offload much of internal IT support to outside resources to provide IT agility through quick technology adaption, cost savings by paying for what you use and focused on end users without the need for specialized IT support. World Wide Web inventor Tim Berners-Lee clarifies, "For geeks," it continues, "cloud computing has been used to mean grid computing, utility computing, Software-as-a-Service (SaaS), Virtualization, Internet-based applications, autonomic computing, peer-to-peer computing and remote processing -- and various combinations of these terms. For non-geeks, cloud computing is simply a platform where individuals and companies use the Internet to access endless hardware, software and data resources for most of their

computing needs and people-to-people interactions, leaving the mess to third-party suppliers.[2]"

Government has been slow in adapting to the Cloud for various reasons but a significant one is due to the fact that there are many disparate and siloed systems and applications that have evolved over the years, many which are non-Web Service or SaaS based. The combined government entities in this study have not attempted any Hosting or Cloud service other than Google mail which did not turn out to be an effective solution.

IT Infrastructure Service Management and Operations

NCOESC is doing the best that they can with utilizing IT staff resources for the IT infrastructure sustainment and services support. Implementing a shared service structure will help with consolidation efforts. However, there are challenges for meeting ongoing IT services as additional support requirements grow with expansion.

Going forward and a long term strategy should include key industry standards and best practice frameworks. Service frameworks such as ITIL help organizations adapt improved practices in order to provide efficient services and cost savings.

Information Technology Infrastructure Library (ITIL)

Current ITILv3 is the industry best practice standard for Information Technology Service Management (ITSM). ITIL is a process, not a project. Why incorporate and embrace ITIL? By implementing ITIL specific ROI comes from:

- Cost savings from expenditure reductions (examples: vendor management savings, bandwidth management savings, asset management savings)
- Cost avoidance from funds allocated for spending that can be saved (examples: hardware savings based on virtualization, new technologies that produce more than older technologies at a cheaper cost)
- Increased IT productivity and reduced costs (example: increased labor efficiencies)
- Increased business activity resulting from higher quality IT services (example: end-user productivity increases; downtime prevention)

[2] Mulholland, Andy, Pyke, Jon, Fingar, Peter. "Why is Cloud Computing So Hard To Understand?" http://searchcloudcomputing.techtarget.com/feature/Why-is-cloud-computing-so-hard-to-understand (January, 2011).

The Financials

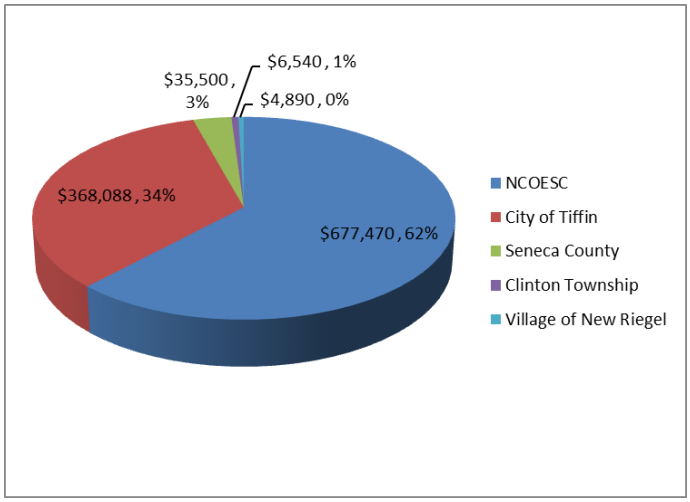
The financial resources assigned to IT of the five government entities are:

Information Technology Expenditure Projections FY 2012 (from "Roadmap" document)						
	NCOESC	City of Tiffin	Seneca County	Clinton Township	Village of New Riegel	Total
Personnel (incl Benefits)	$ 408,419	$ -	$ -	$ -	$ -	$ 408,419
Operations	$ 123,903	$ 223,088	$ 25,500	$ 4,540	$ 4,890	$ 381,921
Capital Expenditures	$ 145,148	$ 145,000	$ 10,000	$ 2,000	$ -	$ 302,148
Total	$ 677,470	$ 368,088	$ 35,500	$ 6,540	$ 4,890	$ 1,092,488

Spreadsheet requests were sent to the larger governments to verify and further examine the financial resources. Not all of the data received was reconcilable with the data shown above. In particular, Seneca County has numerous departments each of which do their own IT spending. Most of them show expenditures greater than that shown in the table above. However, it is not yet clear what parts of Seneca County might choose to be involved in IT resource sharing, so it is not yet possible to determine the summary budget for the county.

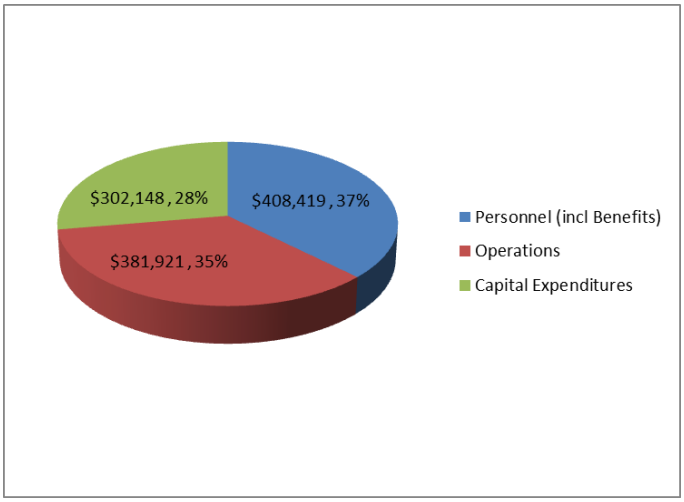
Examining the financials further, within the operations line is approximately $145K in contract expenses. It is unclear whether this is maintenance contracts for vendor support, or contract IT personnel.

From the personnel section we are aware of numerous part-time IT personnel – none of the expenses for such personnel are reflected in the numbers above.



The largest single budget is NCOESC with 62% of the total. The City of Tiffin provides the second largest contribution at 34%.

The absence of the personnel costs related to part-time personnel, and the use of contractors (which show up in operations cost, not personnel) skews analysis of the percentage of personnel costs to the total. While it is not necessary to hit any particular "target" in personnel costs, it is more usual to see personnel costs at 40 to 60% of typical IT organizations.



Capital expenditures are those expenditures required to replace, upgrade, or add new equipment. It is usual in a static (non-growing) environment to see capital expense budgets equal to around 15 to 20% of the installed base of IT equipment. Drawing from the data in the IT Asset section of the surveys:

	NCOESC		City of Tiffin		Seneca County		Clinton Township		Village of New Riegel		Total	
	Count	Value	Count	Value	Count	Value	Count	Value	Count	Value	Count	Value
Physical Server	15	60,000	12	48,000	8	32,000		-		-	35	140,000
Desktop / Laptop	308	462,000	105	157,500	102	153,000	1	1,500	2	3,000	518	777,000
Printer	34	5,100	23	3,450	32	4,800		-	3	450	92	13,800
Switch	1	10,000	16	160,000	3	30,000		-		-	20	200,000
Firewall		-		-	6	48,000		-		-	6	48,000
Phone System	1	30,000		-		-		-		-	1	30,000
Router		-	2	7,000		-		-		-	2	7,000
Total		567,100		375,950		267,800		1,500		3,450		1,215,800
Approximate Capital Expenditure Budget Requirement for Replacement												
Replace at 5 years		113,420		75,190		53,560		300		690		243,160
Replace at 7 years		81,014		53,707		38,257		214		493		173,686

We can see that there is approximately 1.2M$ of installed equipment identified. On a 5 year capital replacement program (not usual) the planned capital replacement budget should be approximately $243K.

Summarizing the Financials

We identified no significant savings in consolidating IT software licenses, as there were apparently no significant SW license expenses in the financial actual or planned expenses.

The capital expenses appear a bit high for the identified installed base of equipment.

Personnel cost appears a bit low, but may be attributed to use of contractors, and not including those personnel who are part-time IT.

Analysis

Based on the information found, basic research into current standards, operational experience and readability – we choose to break our analysis into three sections:

1. Organizational Analysis
2. Infrastructure Analysis
3. Services Assessment

Organizational Analysis

The Impact of IT on Innovation

In installing an Information Technology head as the leadership of the consolidated IT personnel, the organization immediately gains an advocate for IT issues, and a central manager of IT personnel. Additionally, the development of IT strategy and direction is one of the main roles of the position.

However, the chief impact of an information technology led organization lies in the pro-active engagement of the people within IT in the business improvements of the organizations they are serving. In order to accomplish this, there is a subtle, but real shift from “support” to “analyze and improve” on behalf of at least those people who interface with the departments – the application support personnel.

Without this shift, the leader (and the organization) is missing key visibility, input, and understanding of the issues facing the departments. This position becomes limited to a provider of services as requested with more requests than resources can satisfy.

The support of senior management and the successful transition from “support” to “improve” are key behavioral factors in determining the success of even the best candidate for the position.

Infrastructure Analysis

This section includes the analysis and recommendations for the topics discussed in the Surveying Assets and Findings section above. These recommendations are based upon today’s industry standards and best practices which include several references to key articles. These recommendations are presented to provide a roadmap to implement enterprise level solutions which in turn provide service level efficiencies, economies of scale and produce cost savings in the long run.

Virtualization Recommendations

In today's computing environment, the strategic direction to virtualize as many servers as possible is critical. Server power is evolving rapidly with increased processing power, more cores, and more memory and disk space available. IT asset and processing cost efficiencies for server and storage are tremendous. An Intel study on Virtualization showed that their virtualization configuration tests delivered increased performance while achieving a 5:1 consolidation ratio compared to the current physical production configuration, demonstrating the potential to reduce server total cost of ownership (TCO)[3].

Anti-Virus Consolidation Recommendation

Centralized anti-virus management with formal antivirus management practices meets optimal security requirements on workstations, laptops, and servers. The NCOESC would provide the centralized anti-virus management for all entities under the shared services support model. Sophos, currently implemented at the ESC, while maybe not the premier anti-virus solution, is certainly an enterprise level endpoint protection and security product. According to the TopTenREVIEWS website the Sophos virus scanning kernel is 100 percent Virus Bulletin certified, as well as West Coast Labs checkmark certified and ICSA labs certified. **Sophos** is a good corporate security solution, combining virus, spyware and adware protection. The management is simple and the virus kernel is effective[4].

Centralizing the anti-virus management includes the following advantages:

1. Improved control of critical updates for the smaller entities
2. Reduced maintenance since one organization will provide services
3. Improved security for the smaller entities
4. Standardization of software and the reduction of multi-vendor, multi-agent platforms
5. Simplified purchasing and licensing advantages
6. Alignment with organizational objectives

[3] "Virtualizing Mission-Critical Applications." IT Intel Whitepaper - IT Best Practices Cloud Computing. January 2011.

[4] TopTenREVIEWS, http://anti-virus-software-review.toptenreviews.com/small-business-antivirus/sophos-anti-virus-small-business-edition-2.5-review.html

Asset Management, License Management and Compliance Recommendation

A multi-purpose software tool that provides asset/license/compliance tracking would automate the asset auditing, license tracking and compliance of IT inventory for hardware and software. The value this solution brings is multifold as pointed out with the items listed below:

1. Software intrusion risk mitigation
2. Regulatory conformance
3. Streamlined asset management and the elimination of manual inventories
4. Governance for commercial license agreements
5. Penalty avoidance from unlicensed software and vendor audits
6. Identifying the location of little-used systems that could be eliminated or consolidated yielding future savings expenditures and unexpected dividends

In addition to the above, Asset Management reduces help desk calls. "Gartner Research estimates that up to 50% of time spent on a help desk call is associated with trying to determine the configuration of the user's PC. This occurs when help desk staff don't have immediate access to this information and are required to lead callers through a series of steps to obtain it.[5]"

An example of one option which happens to be a Cloud solution is Microsoft Windows Intune. Windows Intune enables the centralization of workstation management through a single web based console. The current release builds on the all-in-one solution that brings together cloud services and an upgrade subscription for the Windows 7 Enterprise operating system to help customers simplify asset management and security.

Backup/Recovery and Disaster/Recovery Recommendations

Under the shared service agreement, backups for all entities would reside under NCOESC shared facility support. This would reduce risk for the smaller entities that have little or inadequate backup services and provide common infrastructure components and practices.

Once combined, a backup audit should be performed to eliminate any gaps or holes that there might be due to integration, system, database, network or other

[5] Express Metrix. "Quantifying ROI: Building the Business Case for IT and Software Asset Management". http://www.expressmetrix.com/pdf/ROI_6.pdf

environment modifications. Backups are currently not being tested most likely due to the fact that the IT staff does not have the bandwidth to perform backup/recovery testing. This enables a potential vulnerability when a production level restore is needed due to an outage, corruption, or other causes. The testing of backup and recovery scenarios helps to meet risk management initiatives and provides the IT staff with less anxiety should a need arise to perform a point-in-time recovery. Many recovery attempts have failed due to lack of adequate planning and testing.

Disaster recovery (DR) operations are somewhat suspect. A DR effort when needed for recovery is usually very complicated. Large sites provide sophisticated DR planning and testing. This may be difficult for the Shared Services due to staff bandwidth, funding, and other reasons.

More secure options might include utilizing vendors such as Iron Mountain, Barracuda Networks and others who provide offsite storage and secure protection which would alleviate any doubt on media reliability. In addition, there are new technology solutions that include Cloud based backup services where you can outsource your backups to cloud based service centers. Your backups are auto replicated to the cloud centers which offloads many of IT staff's on-premise backup responsibilities.

Database Recommendations

FileMaker databases are ranked somewhere between a lower end database such as Microsoft Access and the high end enterprise databases such as SQL Server and Oracle. The web applications along with other applications integrated into Filemaker appear to function well and it is fairly easy to create simple applications to access the FileMaker Server backend database. However, this is mainly true for the technical staff that has familiarity and past experience with Filemaker. FileMaker solutions like MS Access do not provide enterprise driven architectural design and efficiencies, open and integrated characteristics, fault tolerance capabilities, best-in-class reliability, high volume transaction speeds, mission-critical depth, scalability, and emerging technologies features.

The database landscape for future growth and expansion should consider the migration to SQL Server enterprise level. This would fall in line with the State of Ohio IT direction. The State has mandated a roadmap to enterprise solutions. *Increase use of enterprise applications/solutions – expanding the use of enterprise applications/solutions will facilitate integrating disparate data sources.*[6] SQL Server Integration Services (SSIS) and SQL Server Reporting Services (SSRS) would provide a holistic approach to meet ongoing data integration, reporting, and information management requirements. This SQL Server and Microsoft Application Platform path

[6] Ohio Dept. of Administrative Services Office of Information Technology (OIT) 2011 Accomplishments, page 1. http://das.ohio.gov/LinkClick.aspx?fileticket=Ki7AWcD1qgI%3d&tabid=79

would also work well with integration into Microsoft SharePoint Server. There are conversion tools available such as FmPro Migrator from Dotcom Solutions that help significantly with migrations from FileMaker to SQL Server.

Cloud Computing Recommendations

Cloud solutions for the NCO Shared Service environment to be established from this study are not feasible at this time except for a few specific areas such as for backup/recovery, disaster/recovery and asset management. However, there may be certain new elements or applications in the future that the shared service environment may be able to migrate to. For instance, if a specific commercial off-the-Shelf (COTS) application was installed at the NCOESC and a Cloud option became available, then a path to migrate to the Cloud version would be available. The key elements for a Cloud solution that any organization must look at are: (1) Must be Application driven (SaaS), (2) Employ a Web Services model, (3) Be willing to outsource hardware, storage and IT services. Cost savings from the Cloud model come from offloading the hardware requirements plus IT service support and operations cost from an on premise solution. ''Enterprises can realize 20-40% op-ex savings when switching to a cloud computing strategy (largely from fewer IT staff) and it virtually eliminates capital spending[7].”

The NCO Shared Services organization would benefit with aligning a long term strategy and viability of moving some IT services and applications to Cloud offerings.

Services Analysis

Email Domains Recommendation for Consolidation

The smaller government entities are siloed and will gain immediate benefit of basic IT services and interoperability (email, calendar, files transfer, internet access, basic collaboration, and presence) when shared services are implemented. The consolidation of Mail to a central location, which is the North Central Ohio Education Service Center (NCOESC), along with the shared service support would provide cost reduction and support benefits. In addition, moving forward strategically would include the migration all mail to Exchange 2010 integrated with the proper Active Directory infrastructure. While not a trivial migration effort, the long term benefits outweigh the short term project requirements. Exchange provides an enterprise class solution, reliability, scalability, risk control, and integration to other Microsoft products such as SharePoint. The critical ability to archive email would also be greatly enhanced in Exchange 2010.

Cost savings would include the reduction of software licensing needs, ongoing software maintenance fees, bulk purchasing discounts, the reduction of hardware

[7] Oppenheimer – Equity Research Industry Update. “Cloud Services White Paper: Adoption is Accelerating”, page 10. (September 20, 2011)

requirements, reduction of ISP costs and the reduction of technical labor support needed for the entities absorbed within the shared services. Forrester Consulting created a report based on nine existing Exchange customers with key findings on ROI and Cost Avoidance. The ROI for the composite customers was a payback period of less than six months after deployment[8]. The State of Ohio has standardized on Exchange and in 2011 migrated from Exchange 2007 to Exchange 2010[9].
Exchange would also provision for continued separation of email domains for each entity organizational requirements. This is achieved in Exchange 2010 by:

1. Creating a new authoritative domain. This will define the second SMTP namespace that the organization will accept email for.
2. Create a new email address policy with a recipient filter. This will stamp the recipients with the email address that will need to be configured and will apply the second namespace to a subset of recipients in the domain.

In 2007, the research firm, Hansa-GCR was engaged by Microsoft to perform quantitative research based on 162 organizations concerning specific core infrastructure best practices and IT operations. Cost savings compared IT labor costs per server and per year for organizations that had adopted best practices for various server infrastructure workloads. In this case the infrastructure comparison was for best practices that MS Exchange 2010 email server architecture provides inherently. Cost savings are listed below[10]:

- Email server virtualization: Approximately $16000 per year.
- Automated deployment process: Approximately $9000 per year.
- Email server automatic feedback and reporting: Approximately $7000 per year.
- Email system maintenance: Approximately $4000 per year.
- Threshold of Advanced Parameters: Approximately $3000 per year.
- Load balancing within service/cluster: Approximately $4000 per year.

OpenText FirstClass has some reliability and vulnerability issues. For example, NCOESC had a user email corruption issue within the last year. This occurred in the master file which kept track of the individual email files. Since the corruption in the master file occurred, the mirror copy was also corrupted. After calling OpenText support, there was no easy remedy due to the distributed architecture of the many email files created. All historical email for that user was lost. FirstClass backups are problematic in

[8] Diddee, Amit. "The Total Economic Impact of Microsoft Exchange 2010." Forrester Consulting. November 2009.
[9] Ohio Dept. of Administrative Services Office of Information Technology (OIT) 2011 Accomplishments, page 5. http://das.ohio.gov/LinkClick.aspx?fileticket=Ki7AWcD1qgI%3d&tabid=79

[10] Hansa-GCR Research. Abstract: Server Infrastructure Optimization – Best Practices to Reduce IT Operational Costs. January 2009.

that there is no way to see into the information store to back up the mailboxes. Many of the high-end backup tools such as BackupExec, which is being utilized at the NCOESC, do not provide support for FirstClass mail. Also, email archiving is not viable since there is no built-in support for the archiving of email.

Help Desk Recommendations

Implement a robust help desk product, with problem reporting tools, and procedures, trouble ticket tracking, incident management and resolution. Support the help desk with personnel who can utilize phone support, remote management of computers, and dispatch able resources to resolve problems. With the proper software tool support, the help desk ensures that the same processes are being used regardless of the location. Enterprise level help desk products include BMC Remedy Help Desk and AutoTask Help Desk products.

Key Findings

The key findings are presented in three parts:

1. The five entities' organizational assessments as related to IT – the entities' current IT organization, structure, processes and methodologies, leadership, and planning.
2. IT infrastructure assessment – the physical facilities, capacity, and ability to handle current and predicted future workloads.
3. IT Services assessment – the services currently provided, service levels, and projected service level requirements in a shared services scenario.

Recommendations are drawn from the findings and current standards of practices and procedures for IT.

Key findings:

1. Organization
    a. The five government entities' IT organizations are different in significant ways. NCOESC has a formal IT department, personnel, facilities, and budget. The City of Tiffin has IT personnel embedded within functional departments of the city such as the Finance Department, Tax Department and Fire Department. Some IT functions of the City are currently being supported by the IT department within the NCOESC. Seneca County similarly has department-level IT with some percentage of individual worker's time being spent on IT related functions while those personnel are also performing the functions of their departments. The County supports these people and departments with the help of outside contractors where necessary. Major departments within the County are not under consideration for IT resource sharing including the Seneca County Courts, the Sheriff's Department and Job and Family Services. Clinton Township and the Village of New Riegel uses State of Ohio provided payroll services and purchase other services such as computer provisioning, internet services and email from commercial providers. The formal IT Departments of the five government entities involved are thus only the IT department of the NCOESC.
    b. Consolidating or sharing IT resources among the five parties involved is less a merging of existing IT personnel, budgets, facilities and services and more utilizing the resources that exist to begin building both common basic capabilities such as email, back-up and disaster recovery and security; and application specific capabilities required by the five

entities on a budget sustainable, service-oriented, and technology leveraging path.

c. IT planning, IT processes, IT tools, and IT leadership to support these five entities are necessary, and are unlikely to be developed within any one of the entities – economies of scale make it prohibitively expensive for any one entity to dedicate the resource necessary for planning, developing and executing process-driven services, purchase and support enterprise level tools or attract and develop IT leadership.
d. The costs to the individual entities if they do not implement planning, processes, tools and leadership is, in both the long run, and short term – unsustainable. The cost takes several forms – absence of basic services, absence of security, absence of records retention, absence of disaster recovery, lack of leverage of IT related purchases, inefficient business processes, higher failure rates and recovery times, lower levels of expertise on systems and applications, increased difficulties in hiring and retaining qualified expertise, and expensive forays into technology dead-ends. The services levels provided to end-users are lower and more expensive than would otherwise be possible through having access to standards, practices, tools and IT leadership.
e. If the five entities choose to pool some resources, to share in expenses, to leverage larger purchasing powers and common infrastructure and systems they gain some immediate increase in levels of service, in lowering expenses, and common guidance in IT decision making, than if they were to each individually purchase and manage those services.
f. The combined IT related resources of the five currently involved entities are insufficient to quickly implement an IT organization with high-level leadership, with common systems, with enterprise-level tools, with current standards in processes and with fully developed IT strategies, plans and budgets.
g. If the five currently involved entities are successful in implementing shared IT resources, growth of the successful sharing to include other entities may provide an intelligent path to increase resources and increase the adoption rate of common systems, tools, processes, and leadership. Such growth would be longer term (three to five years) but should not be allowed to take longer as the requirement to lower costs and increase service will continue through the period of transition.

2. IT Infrastructure

a. The IT infrastructure of the five entities is concentrated in a central facility for NCOESC and the withheld organizations of Seneca County Courts, JFS and County Engineers. The remainder of the IT infrastructure is servers, network and PCs co-located within the various departments of the City of Tiffin, County departments, Clinton Township and Village of New Riegel.
b. The physical facility at NCOESC appears to have sufficient space (in the room and within existing server racks) to hold most, if not all, of the systems that can be moved from current locations (The Clinton Township server, various departmental servers within Seneca County not withheld, and various City of Tiffin departmental servers not withheld) if such transfers utilize (new) virtual servers added to the existing racks. Networking bandwidth to NCOESC currently installed and planned should be sufficient for such work that might be transferred to a shared resource located at NCOESC but upgrading TWC bandwidth should be a priority or if possible migrating to AT&T fiber. Physical security at NCOESC requires some level of upgrade to accommodate security requirements of the shared facility.
c. Common basic practices of backup, restore, records retention and disaster recovery are in place at NCOESC, but would need to be repositioned and upgraded as common infrastructure components and practices for the shared facility.
d. Those systems withheld from shared systems agreements would remain located and managed by their current owner / operators. Such systems may still benefit from common purchasing agreements for their replacement and upgrade cycles.
e. Systems that need to remain located in the departments where they are currently located can still be a part of the resource sharing arrangement. Such systems would benefit from assistance through remote systems management, backup and restore capabilities, disaster recovery planning and tools, capital planning, help desk support and be a part of technology planning and acquisition activities.

3. IT Services
    a. Excepting purchased systems such as Internet Service agreements or purchased applications – most of the services provided by IT within the five entities are in the form of “running applications” not as defined services. Service agreements, standards and levels of availability (uptime) need to be defined and utilized as the basis of agreements

between each of the entities and the sharing organization. Service Level Agreements (SLAs) become the basis of exchange for the entities participating in the sharing arrangement.

b. Common building blocks enable efficiencies of operation and acquisition. Enterprise level systems for email, internet services, file exchange, security software and practices; backup and restore capabilities and disaster recovery are required and are a part of the basic SLA for the participating members.
c. Application services include provisioning and operating higher level applications perhaps specific to individual departments within the City, County or any of the entities. Such applications require both the hardware, software, and networking required; but also operations and support expertise to assist end-users in using the application(s). Personnel who are experts in the operations of the systems supporting a given business area are required to be able to effectively provide application level services.
d. Procedures and tools for end users to communicate problems with the system (or their understanding and operation of the system) are required to: report and resolve problems; track recurring problem areas; develop pro-active resolution of recurring problems such as changes to the system or end-user training; provide metrics and measurements on the effectiveness of a given service.

Key Recommendations

1. Implement shared service agreements among the five entities: NCOESC, City of Tiffin, Seneca County, Clinton Township and Village of New Riegel.
2. Name or create a governing body or Board to set and manage policy, solicit and enter service agreements among the current five entities and additional entities as determined by the Board.
3. NCOESC will name a Director of Shared IT who will be responsible for:
    a. Development of IT Strategy
    b. Development and adoption of IT Standards and Processes
    c. Selection and Implementation of tools in support of IT Processes
    d. Development and management of IT financial requirements and budget
    e. Acquisition policies and practices leveraging purchasing power of all participating entities and setting standards for maintenance and support agreements with vendors that are compliant with service level agreements and help desk support
    f. Management of personnel within the shared services organization and those IT personnel (part-time or full time) who are dotted-line also reporting to their department of entity organizations
4. The NCOESC will employ those personnel, provide the physical facility and manage operations of shared IT resources per the direction and policies set by the governing Board, compensated by funds gained through the shared service agreements entered into by the Board.
5. Organize IT personnel: those that are part-time IT with other functions remain where they are but are trained and made a part of the shared resource agreements; those that are full-time IT, but are to remain within their existing organizations, and those who are dedicated to building, operating and supporting the shared resources.
6. Create an organization structure with defined roles and responsibilities:
    a. Contracts, Purchasing, Standardization of Maintenance and Support Contracts
    b. Planning, Strategy, Selection and Development of Standards and Processes, Selection of Tools necessary to support the processes
    c. Infrastructure Operations, Management, and Support
    d. Applications Operations, Management, and Support
    e. Project Management, Implementation, and Development Resources
7. Implement common, enterprise level email compliant with record retention, archival and legal standards. Microsoft Exchange is one such email server

package – Yahoo, Google, First-Class and others currently being used are insufficient.

8. Implement with tools and processes: backup and restore capabilities, security software distribution and management, disaster recovery, and firewall protection.
9. Implement a help desk function, with problem reporting tools and procedures, trouble ticket tracking and resolution. Support the help desk with personnel who can utilize phone support, remote management of computers, and dispatch able resources to resolve problems.
10. Develop personnel expertise in application areas to be supported by the shared resources agreements. These personnel to provide application level support for the help desk, and to proactively engage in the end-user groups utilizing the supported system(s) in their most effective use. These personnel may engage in end-user training on the application system, in participating in requirements planning for new or replacement systems, or in advising end-user decision makers in more effective use of the systems.
11. Develop or package service offerings including, but not limited to:
    a. Standardized purchasing
    b. Basic end-user PC/Workstation package including standardized hardware, software, virus protection, back-up/restore capabilities, and connection options
    c. Basic email, web server and file server bundle. Includes domain name, email addresses, and secure storage and managed access for small government entities, departments within larger entities, or larger entities
    d. Application level service offerings

Discussion of Recommendations

The recommendation to engage in IT sharing agreements and the need for governance requires little expansion. However, the recommendations dealing with naming of a Director and organizing personnel can be expanded.

In order to develop deeper skill sets, to assign areas of responsibility, and to manage to expectations: personnel should be assigned specific roles. The proposed organization chart is representative of typical IT division of labor, and sets forth specific assigned roles and responsibilities.

The number of boxes in each department is not the count of personnel to be assigned to the shared IT resources group.

Proposed Organization Structure

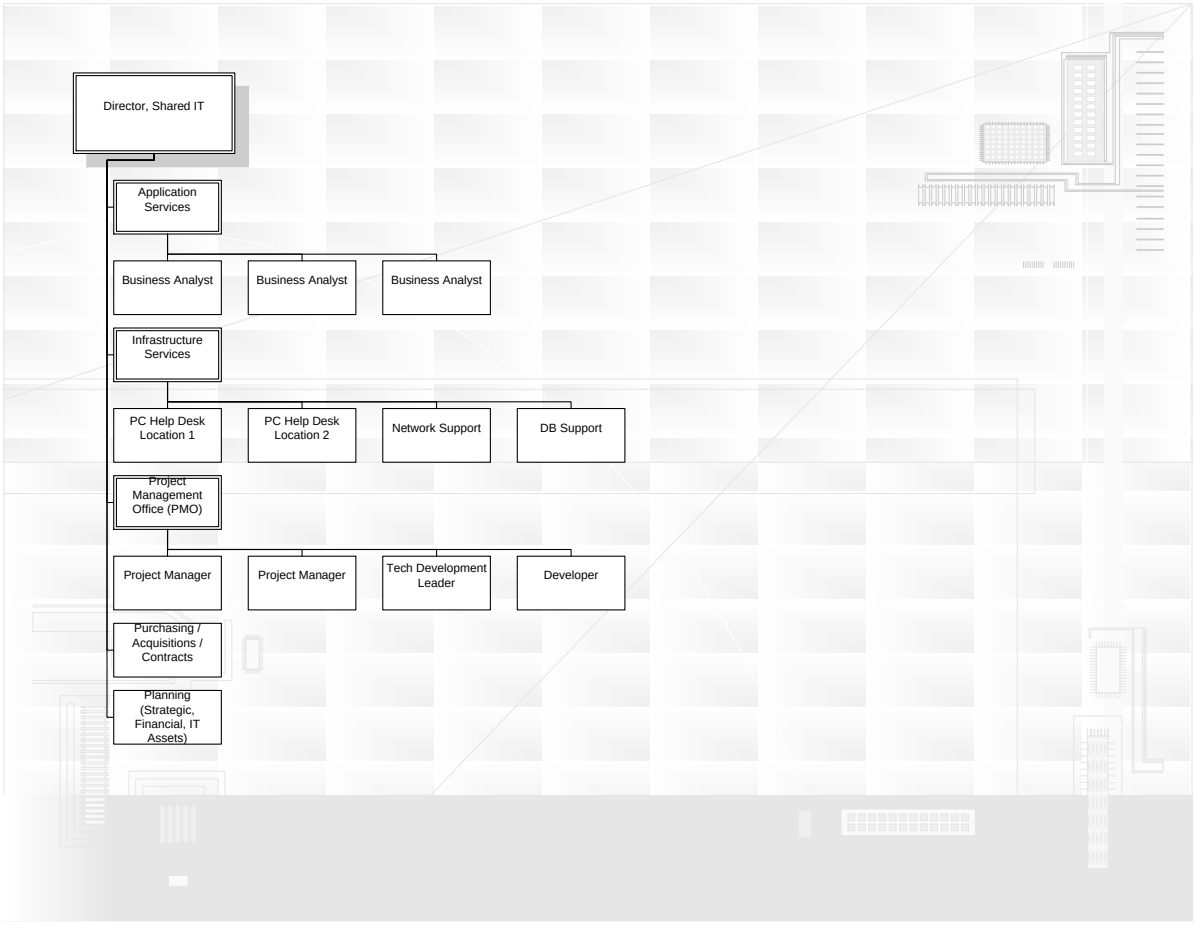


Figure 5 - Proposed Organization Chart

Roles and Responsibilities

Functional responsibilities are in summary: leadership, planning, purchasing, keeping the infrastructure running, supporting users, and implementing new customers, systems and programs.

These functions are divided:

- Project Management office handles projects: tasks that have a defined beginning and ending, such as implementing a new system, bringing up a new customer, etc.
- Support is a major part of normal operations: users reporting a bug or needing explanation of how something works typically begins through a call to a help desk and is then handled immediately or routed to an appropriate specialist: networking, application, or other. Both infrastructure and application personnel are responsible for support.
- Day to day operations – monitoring the state of systems, verifying systems remain within capacity and nominal operating parameters, scheduling routine task – are all a part of infrastructure management.
- Application support personnel are experts in the business use of an application or applications. They understand the business function being done and the use of the application(s) that aid in that function. They frequently become advocates of more efficient processes through the use of the application(s).
- Planning includes asset management, IT strategy, technology forecasting, and financial budgeting.
- Purchasing is responsible for implementing standardized agreements, and directing purchases to the technologies as set forth by planning.

Gap Analysis

Based on the interviews of the directors, IT personnel, examination of the finances and IT Assets, this study has identified and listed findings and made recommendations. From these, we can identify the gaps between current state and the recommended (desired) state. The GAP analysis helps assure that the original issues have each been addressed and that the recommendations each induce some part of the desired state. It is both a reason check, and a checklist.

Gap Analysis		
Current Situation	***Desired***	***Recommendations***
1. The five government entities' IT organizations are different in significant ways resulting in inconsistent hardware, software and processes.	Standardized systems and processes with improved speed and reliabiility.	1. Shared service agreements; 3. Director of Shared IT.
2. Because there are limited IT resources within the organizations except in NCOESC, consolidating existing resources into a common organization is not feasible.	Building common basic capabilities as well as application specific capabilities across the five government entities.	1. Shared service agreements; 4. NCOESC will employ the personnel, provide the physical facility and manage operations of shared IT resources; 3.b. Development and adoption of IT Standards and Processes.
3. Economies of scale make it prohibitively expensive for any one entity to dedicate the resource necessary for planning, developing and executing the needed services.	A common process for all five entities to achieve common IT processes and savings	3. Name a Director of Shared IT. 5. Organize IT personnel.
4. The costs to the individual entities if they do not implement planning, processes, tools and leadership is, in both the long run, and short term – unsustainable.	IT focus sufficient to achieve highly proficient depth of knowledge and service	3.a. Development of IT Strategy; b.Development and adoption of IT Standards and Processes.
5. The main IT infrastructure of the five entities is concentrated in NCOESC and the withheld organizations. The physical facility at NCOESC appears to have sufficient space to hold most, if not all of the systems that can be moved from current locations.	Consolidate infrasturcture management and support where possible.	4. The NCOESC will provide the physical facility and manage operations of shared IT resources.
6. There is inconsistent application of processes and tools for processes such as trouble ticketing, problem resolution, end-to-end controls, prevention procedures and repeatable processes.	Improved problem resolution, more issues resolved before occurring, performing efficiently	8. Implement a Help Desk function with supporting processes.
7. Some personnel and systems need to remain located in the departments where they are currently.	Ability to benefit from common purchasing agreements and IT practices and procedures.	3. Those that are part-time IT with other functions remain where they are but are made part of the shared resource agreements; 5.e. Acquisition policies and practices leveraging purchasing power of all entities.
8. There is an absence of coordinated IT Strategy and IT planning, resulting in continued use of older technologies, and insufficient and late adoption of newer, lower cost, best-of-breed and more effective technologies.	Avoiding traps in older systems, applications, technologies while getting benefits of appropriate, perhaps newer technologies in a timely fashion.	2. Governing Board to set and manage policy, solicit and enter into service agreements; 3.a. Development of IT Strategy.
9. Application services include provisioning and operating higher level applications perhaps specific to individual departments within the City, County or any of the entities. Such applications require both the hardware, software, and networking required; but also operations and support expertise to assist end-users in using the application(s).	Common hardware, software and practices to enable reliable and less costly operations.	11. Develop or package service offerings including, but not limited to: a. Standardized purchasing b. Basic end-user PC/Workstation package. c. Basic email, web server and file server bundle. d. Application level service offerings.
10. Procedures and tools for end users to communicate problems with the system (or their understanding and operation of the system) are required.	Common methods to report, track and resolve problems.	9. Implement a help desk function, with problem reporting tools and procedures, trouble ticket tracking and resolution.

Figure 6 - GAP Analysis

Implementation

It is expected that this report informs decisions regarding if and how a shared IT resources plan could go forward.

It is expected that the recommendations included in this report will be examined in detail, and modified, enhanced, or even discarded in the building of a plan suitable for NCOR and its constituent members.

This section on implementation would be modified as well in such an examination, but it is set forth to provide a possible sequence that may prove a useful template.

The first issues are those of defining and understanding the nature of the multiple possible sharing agreements that would need to be offered. Given that the needs of the member sharing organizations are different, several service level offerings would need to be at least roughly defined such that each party of the resource sharing agreement understands what they are getting from the arrangement, and a ballpark figure of resources that would need to be committed to make those offerings available.

After such offerings are defined and accepted by the parties, agreements and governance issues need to be addressed.

From there, formal planning of budgets, personnel, systems and implementation of the services defined and accepted.

Implementing the services would follow and given that resources are limited, would prioritized based on the maximum offering to members with the funds available.

This would likely take the form of phased implementation as funds are obtained or accrue from ongoing operations. If grants or other sources of funds are available to accelerate implementation the process would begin with repurposing existing equipment to implement the basic services: a shared acquisition program, basic workstation package, and basic email/web services packages provide the fastest benefits to the largest number of members. It can be expected that operating cost savings begin accruing when such services are available.

Additional service programs can be built as funds and capacity to develop and implement them allow. A suggested priority would be asset / inventory management; help desk support and problem tracking; then the application services in order of least expensive and most served proceeding to the more expensive / fewer served.

Each service offering will have demands on personnel, and while such demand are at least partially offset by some personnel ceasing work on the retired system in favor of the new system offerings – there will be a pace of change dictated by the amount of personnel that can be made available to the shared resource team.

Sequenced IT project priorities:

1. The physical facility – improve physical security; organize racks and networking equipment
2. Levels of hardware based firewall security (buy the firewalls, redo the cabling and networking within the facility)
    a. Outside the firewall for web and email services
    b. Inside first level of firewall for application systems
    c. Inside a second level of firewall for databases, domain controllers, etc.
3. Add hardware servers (in the existing racks), and make them hosts for virtual servers ready to receive:
    a. Move City of Tiffin systems to facility (those ready but not yet moved)
    b. Build (virtual) email and web servers as foundational offering of email, web service offerings. (SW licenses, build services)
    c. One (virtual) server for managing backup / restore services for all entities. (SW licenses, build services)
    d. One (virtual) server for monitoring and managing software on connected PCs (version updates, antivirus, etc.) (SW licenses, build services)
    e. Asset management / maintenance management system (80k software, installation, and getting initial inventory into system)
    f. Help desk / trouble ticketing and tracking system
4. Improve network capacity with phased implementation of fiber between main service points and to main data center (NCOESC). Recommend dedicated fiber into NCOESC (either leased or purchased), expanding to main service points (City of Tiffin, Seneca County facilities) as traffic demands dictate.
5. Develop Service Level Agreements for multiple services
    a. HW, SW leveraged acquisitions program
    b. End-user PC standards and connectivity package
    c. Enterprise level email, web, files sharing complete with unique domain name for each participant (i.e. village of New Riegel, etc.)
    d. Charter school package
6. Program to get off of FileMaker pro
    a. At least SQL based DB with a Visual Studio based development environment to halt new developments on inadequate technology
    b. Conversion tools to convert at least some of the Filemaker applications to the new environment
    c. Select and priorities existing applications, maybe a project to move one or two of them in each round of funds.

7. Develop organization structure and practices – forming governance, training on new tools, process and standards development, management recruiting.

Summary

Sharing IT Resources provides a means for these five, and additional participants, to achieve quality levels of service that they cannot achieve at lower costs.

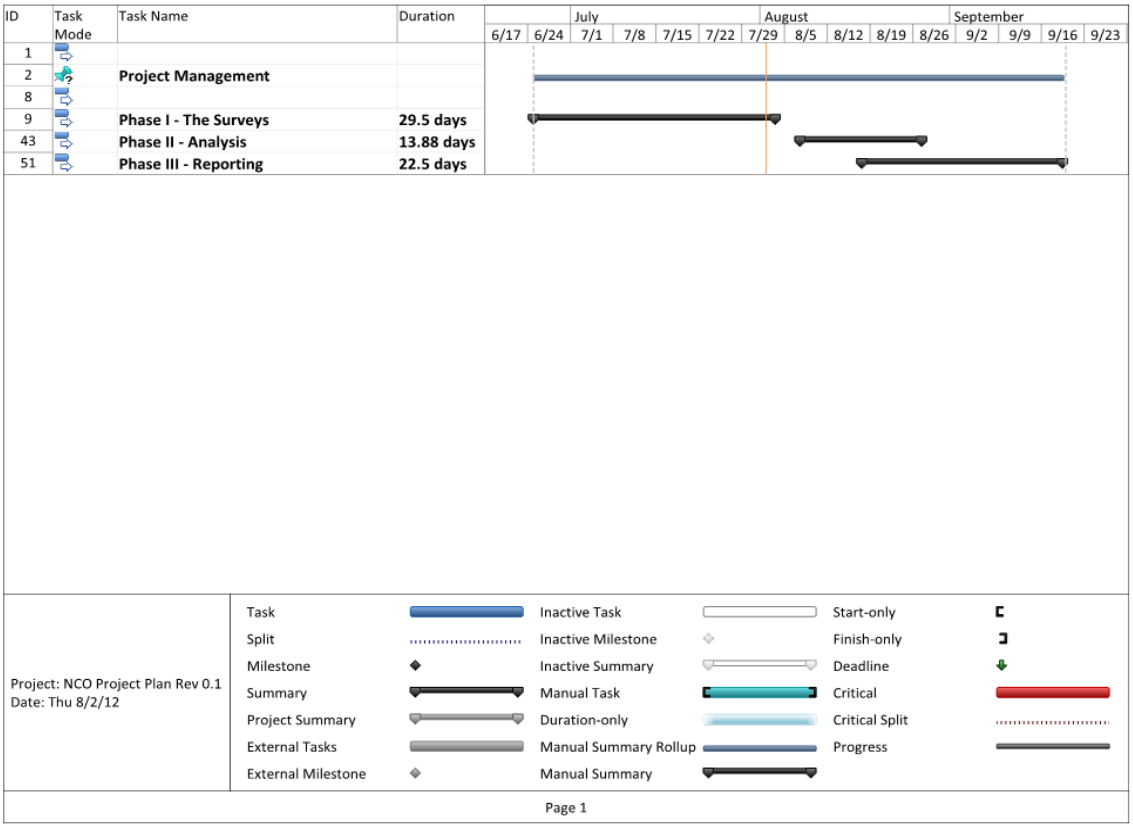
It is our belief that this report provides data and analysis that will help inform the decisions necessary to reach the necessary agreements, plan and provide the services, and organize staff and governance in a manner that will grow as the needs grow.

List of Appendices

1. List of IT Employees
2. Project Plan

"IT Interviewees"

- City of Tiffin
  - Director of Finance, Gwynn Reinhart
  - Tax Commissioner, Linda Neeley
  - Fire Department Secretary, Linda Hoerig
  - Police, Lt. Aaron Russell
  - Clerk of Municipal Court, Victoria Comer
- NCOESC
  - Director of Technology and Professional Development, Kathy Mohr
  - Network Specialist/Coordinator, Brian Rupp
  - Network Technologist, Aaron Morgan
  - Network Technologist, Jake Molyet (Note: did not interview)
  - Summer Intern (Note: did not interview)
- Seneca County
  - Tim Constantine
  - Cindy Sendelback (Note: did not interview)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August
September
6/17
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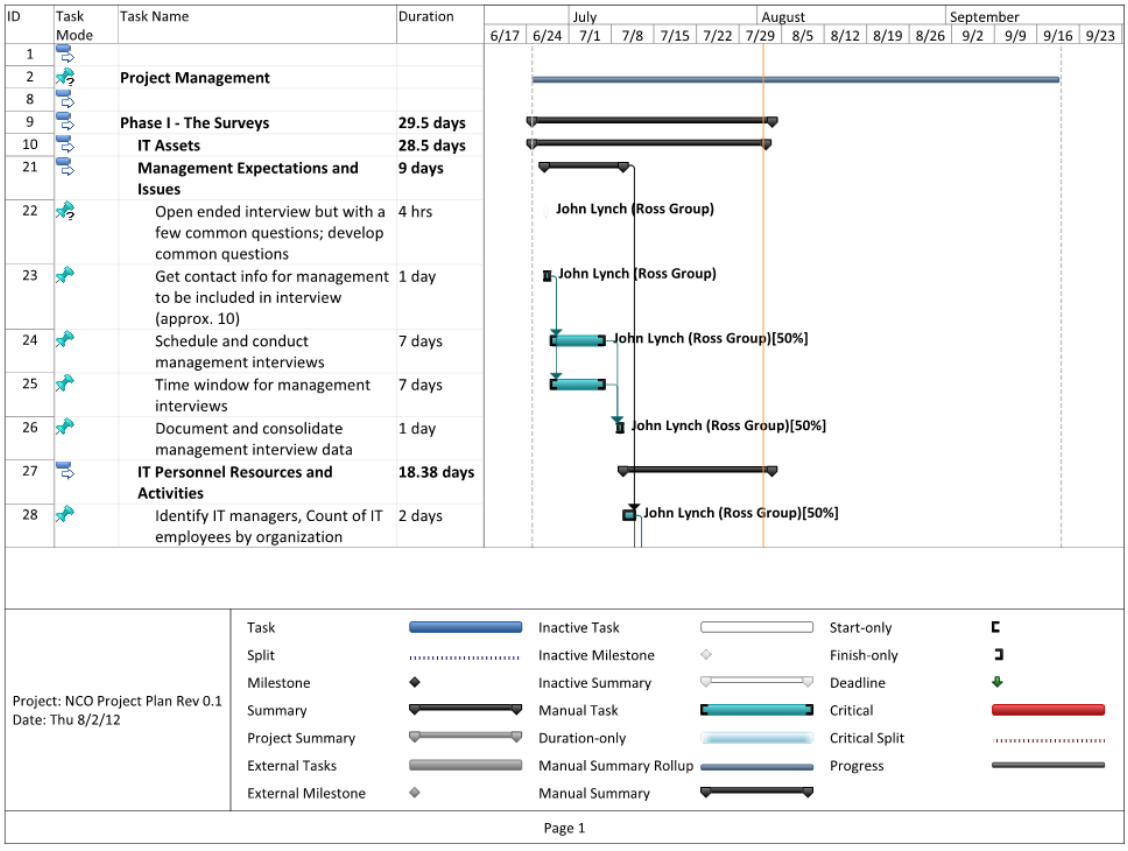
7/8
7/15
7/22
7/29
8/5
8/12
8/19
8/26
9/2
9/9
9/16
9/23
1
2
Project Management
8
9
Phase I - The Surveys
29.5 days
43
Phase II - Analysis
13.88 days
51
Phase III - Reporting
22.5 days
Project: NCO Project Plan Rev 0.1
Date: Thu 8/2/12
Task
Split
Milestone
Summary
Project Summary
External Tasks
External Milestone
Inactive Task
Inactive Milestone
Inactive Summary
Manual Task
Duration-only
Manual Summary Rollup
Manual Summary
Start-only
Finish-only
Deadline
Critical
Critical Split
Progress
Page 1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8/5
8/12
8/19
8/26
9/2
9/9
9/16
9/23
1
2
Project Management
8
9
Phase I - The Surveys
29.5 days
10
IT Assets
28.5 days
21
Management Expectations and Issues
9 days
22
Open ended interview but with a few common questions; develop common questions
4 hrs
23
Get contact info for management to be included in interview (approx. 10)
1 day
24
Schedule and conduct management interviews
7 days
25
Time window for management interviews
7 days
26
Document and consolidate management interview data
1 day
27
IT Personnel Resources and Activities
18.38 days
28
Identify IT managers, Count of IT employees by organization
2 days
John Lynch (Ross Group)
John Lynch (Ross Group)
John Lynch (Ross Group)[50%]
John Lynch (Ross Group)[50%]
John Lynch (Ross Group)[50%]
Project: NCO Project Plan Rev 0.1
Date: Thu 8/2/12
Task
Split
Milestone
Summary
Project Summary
External Tasks
External Milestone
Inactive Task
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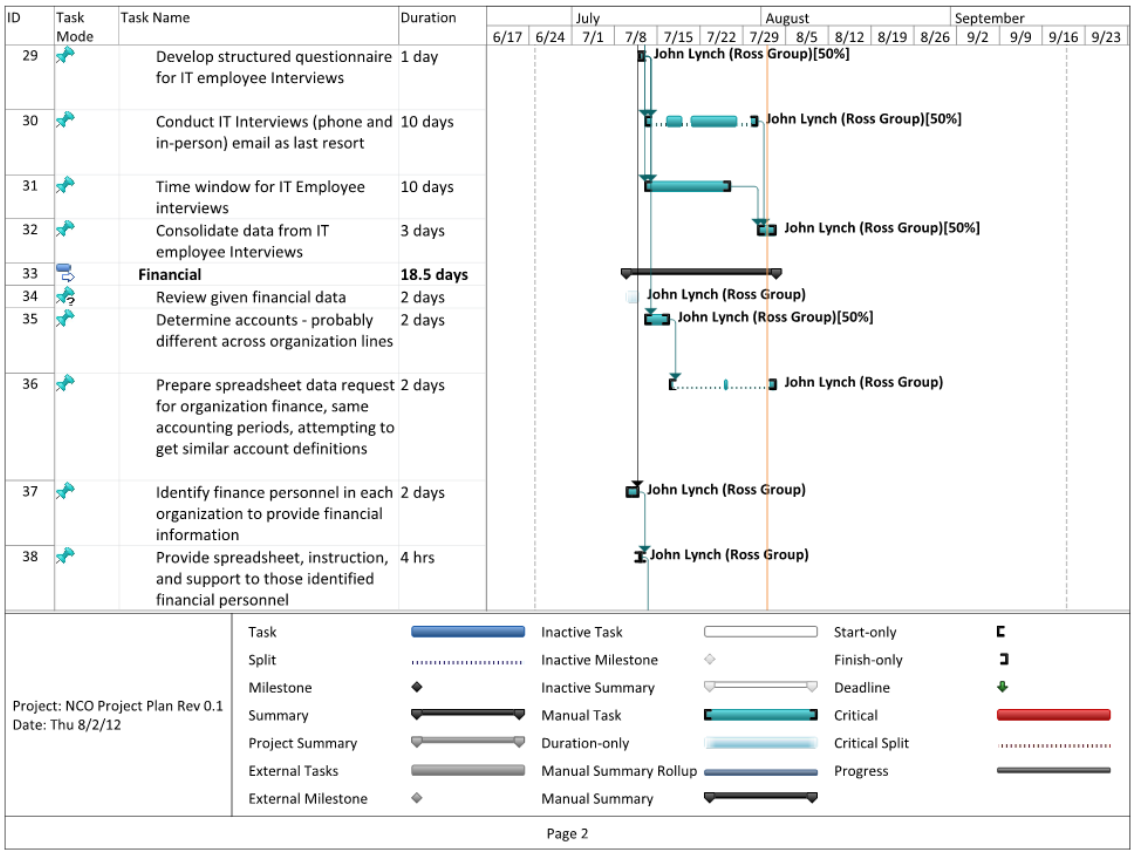
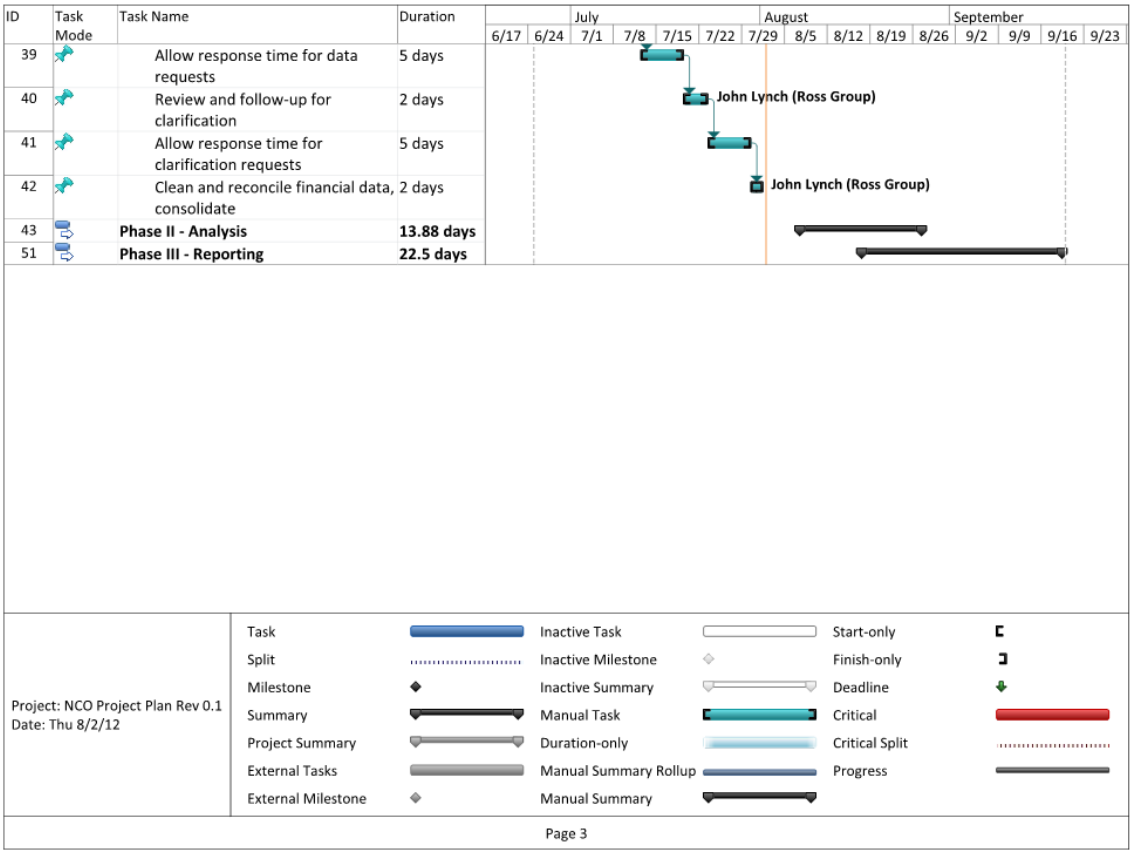
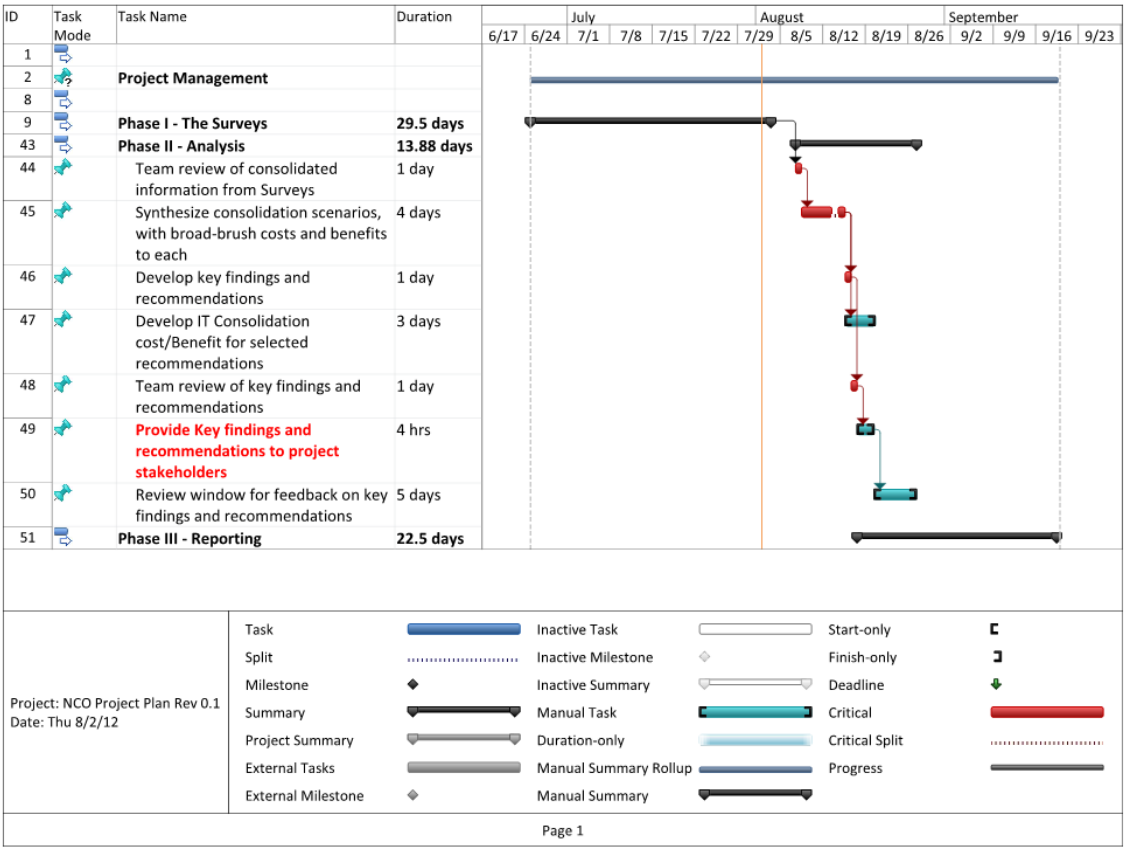


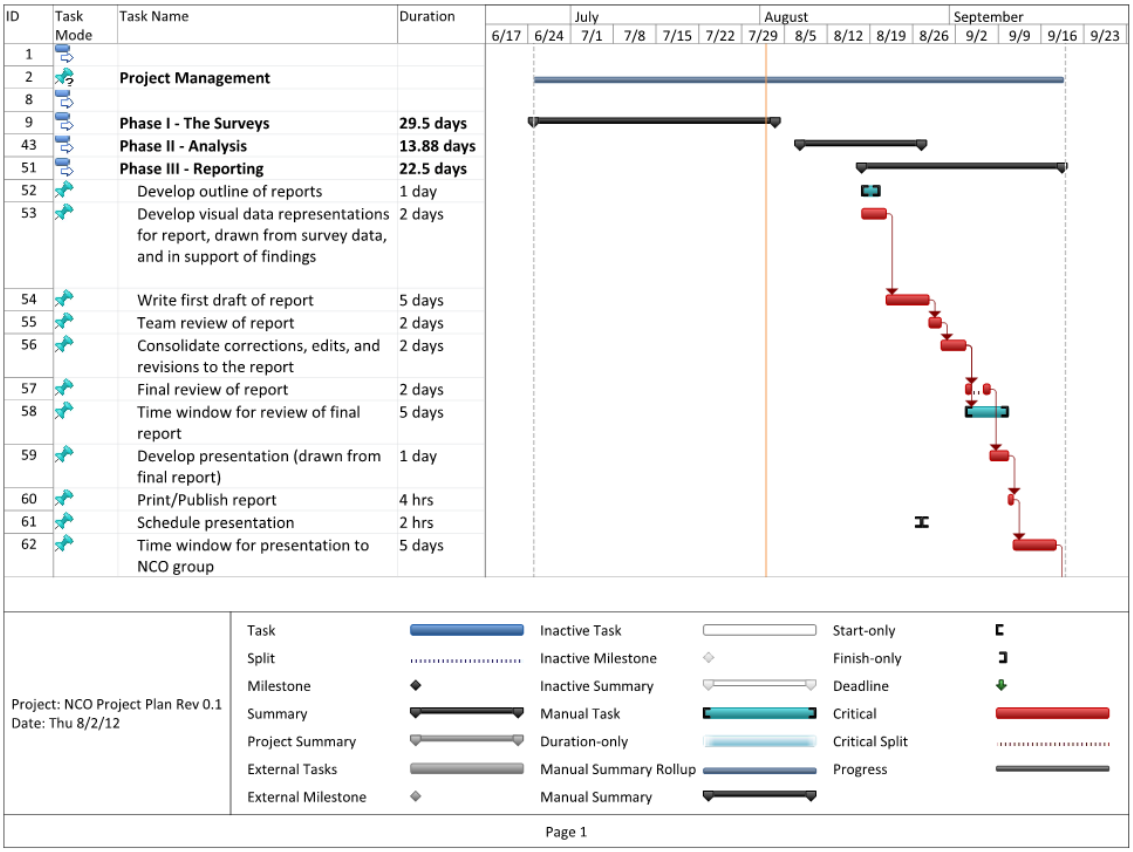
Project Plan, Surveys Phase (3 of 3)



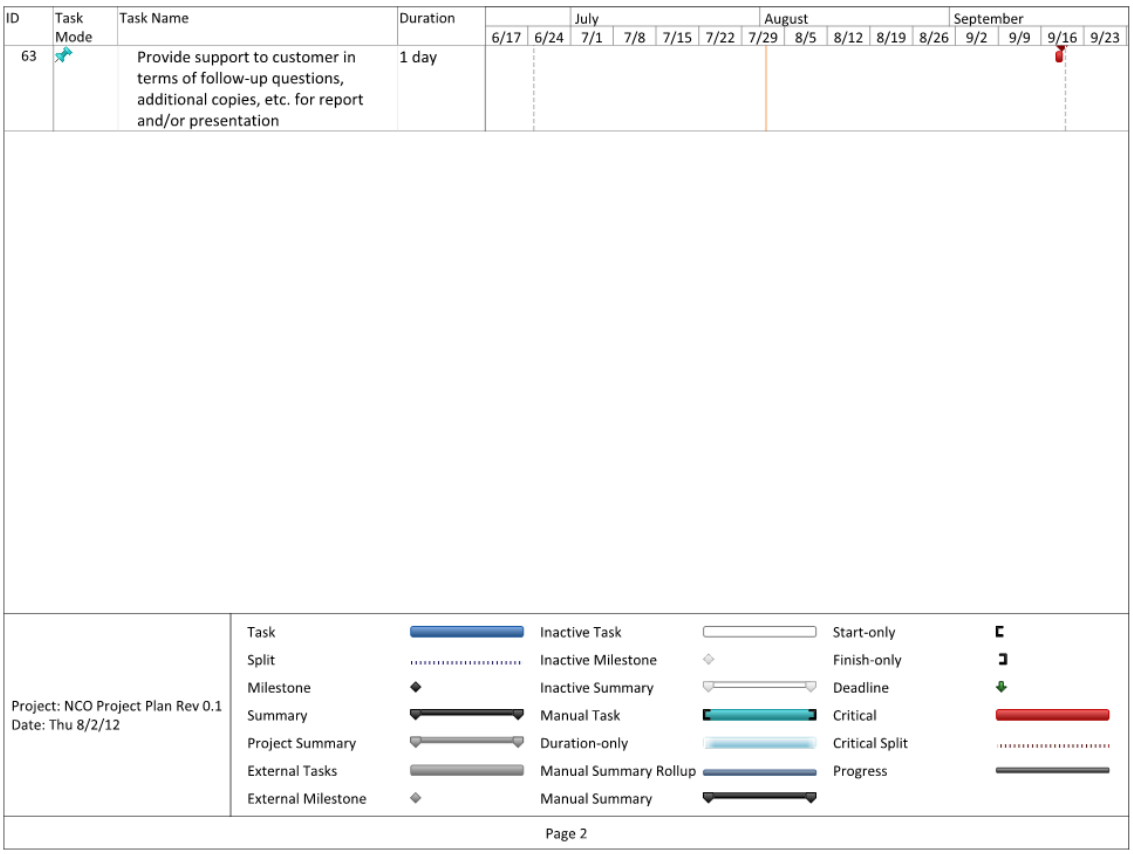
Project Plan, Analysis Phase



Project Plan, Reports Phase (1 of 2)



Project Plan, Reports Phase (2 of 2)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7/8
7/15
7/22
7/29
8/5
8/12
8/19
8/26
9/2
9/9
9/16
9/23
63
Provide support to customer in terms of follow-up questions, additional copies, etc. for report and/or presentation
1 day
Project: NCO Project Plan Rev 0.1
Date: Thu 8/2/12
Task
Split
Milestone
Summary
Project Summary
External Tasks
External Milestone
Inactive Task
Inactive Milestone
Inactive Summary
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Page 2