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Abstract

This is a CSIS 494 Field Experience paper about an internship in a healthcare organization called MercyHealth. My internship would be described as generalized. The paper will be mainly talking about the different aspects of IT and how they all come together to create progress, and cohesiveness in the organization. I had the opportunity to see different aspects of their IT department by sitting down in project meetings. I was able to job shadow multiple staff from admins to PC techs to network engineers. I was able to see first-hand how an organization, and IT respond to disaster, and how they adapt and come up with a recovery/contingency plan. I interned in MercyHealth the summer of 2018 starting in May 7 and ended in Aug 3. Perhaps this paper could shed light on how IT operate in a healthcare organization.

Introduction

My healthcare internship has given me an inside look at how different areas of IT operate as a whole. I was fortunate to be part of the Mercy Health organization as an IT intern. The organization relies heavily on the systems that were established and maintained by various parts of their IT services. I was exposed to those different areas, and I was able to work alongside professionals as they collaborated on multiple pending, and ongoing projects. I was able to work, and job shadow alongside admins, and tech support, and get exposure to each area. I experienced how the IT department operated and reacted when disaster arrived in the organization.

My position as an intern had a broad job description. It was not specialized, but I had the privilege of becoming involved with different areas in the IT department and seeing the bigger picture of how everything comes together as one unit. I came into the organization with an open mind, and the heart to learn. I started working in Mercy Health in May 7, 2018 and ended my internship after the first week of August. I was met by the director of the Information Management Systems, Barbara Johnson who I have been in contact throughout my time in the organization as I was oriented, and introduced to their staff, and facilities. I was slowly introduced to their culture, and their workflow. As an intern, I was given the ability to be mobile and move to different areas where I could be of assistance.

The Organization

Mercy Health is a regional health system which is located primarily in northern Illinois, and southern Wisconsin. There was a merger between Mercy Health, and the Rockford Memorial Hospital System which occurred 2 years ago. A new sister hospital building has been built in the city of Rockford as well and will officially open effectively in January of 2019 along with a couple of clinics scattered around the city. The organization's mission statement proudly states that they value exceptional health care services with a passion for making lives better. They have more than 8,000 employee partners and more than 700 employed physician partners that follow this mission. They have a vision of having excellence in patient care, exceptional patient and customer satisfaction, cost-effective care, and of being the best place to work. They value healing in the broadest sense. They value their patients first. They value family, and they always seek excellence. This is the culture that they are trying to promote.

Their organization is based on a functional structure grouped by their specialization. Their IMS, or Information Management System is a subset of their IT department. Under that umbrella is the Telecom, Desktop Support, and Call Center. They also have the Information Technology/CTO/CSO division which covers systems, database, and network administration. There are also the system analysts, application programmers, and computer training, and management under their respective chart.

Medical records, and other information from their patients reside within EPIC. EPIC is the patient, and provider health informatics software that they have implemented, and integrated into most of the systems they utilized. This is the main service that they use to electronically store and manipulate information across all their systems that is interlinked with the systems put in

place by their network, systems, and database admins.

Project Development

Project Management

There are multiple projects occurring within the Information Systems department. Some are pending, and some have been ongoing projects that haven't been completed due to different reasons. It could be because of lack of resources, or because they are requiring specific information, or verification from another source. It becomes difficult to keep track of each project if it is not properly recorded. It takes a team of project managers, and service managers to keep each other accountability to see if deadlines, and expectations are being met for each. The department initiates these frequent meetings. I have been fortunate enough to have been able to sit down with the managers in the beginning of my internship. It was a great learning experience for me to see how they proceed on taking on new projects that are being implemented into different sectors of the organization. These are projects that are not simply for the use of the IT/IS department but is also being utilized all throughout the hospital by providers, and patients.

Innotas is the project management software that they use to list out their projects and categorize the status of each. Now, it is known as Planview PPM Pro but at the time it was called Innotas. It is a cloud-based IT project portfolio management software. It is good for tracking resources, and finance, and budgeting. The project management team uses it to measure their progress, and they utilize reports that the software provides so that they can view key performances. In that meeting, there were managers that came from telecom, programming, tech support, and applications. The directors that are head of these managers were also present. There were more than 50 projects on the list that they had to check off, and feedback from the persons who are managing each.

VoIP Integration Project

The VoIP Project is one of the main focus of the IT department when I started interning at MercyHealth. The organization was in the process of a merger. It was formerly known as Rockford Memorial Hospital before it was bought by MercyHealth System. The hospital is undergoing a radical change since they have to carry over existing systems from the other hospital site in Janesville, WI, and integrate their own systems to make a cohesive. And because of the new leadership, and organizational culture, they also wanted to make some improvements in their workflow. On top of that, they have built a new hospital again. The goal for the project is to implement Cisco VoIP phones for the new hospital but it couldn't happen without the collaboration of different areas of IT department coming together to get the project rolling. The telecom manager and techs, and the CTO, and Information services director had to be in the same room to make strategic planning, and decision-making on how to go about laying out the groundwork for the new phone system. In order for it to be as smooth as possible, they brought in assistance from a third-party firm from CDW, which is an IT solutions provider for business, and other organizations like healthcare. CDW helps them with keeping track of the different components that are required by documentation from IP routing, and networking to inventory,

and phoneline upkeep, and so forth.

One of the task that had to be done was to look at the blueprint for the new building, and go through each floor thoroughly to pinpoint each station that will have phones placed from wall phones to desk phones, and conference phones. Each phone is placed strategically so that each department's workflow is taken into account. There is a certain number of phones that were ordered, and it was better to have overestimated the amount needed than to be insufficient in that situation. If there was a surplus, the plan was to utilize them in the old hospital. The blueprint already had markings of where the phones will be placed but what we had to do during the meeting was to do a detailed documentation of the inventory count so that we knew how many are going to be needed. We had to make a few changes along the way, and reassess if the department needed them in a certain location or not, or if they even needed that many in one area.
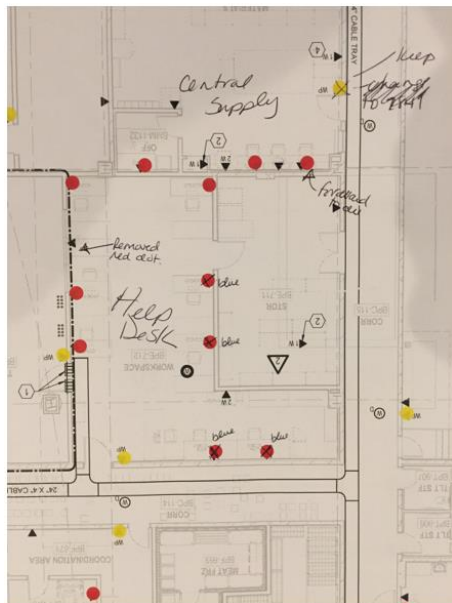

Figure 1

The picture above is a section of a department floor that for the new hospital. The red dots represent the desk phones that are single line while the yellow dots represent the wall phones. There are also blue dots that represent the phones that can handle multiple lines simultaneously, and green dots which are just elevator phones. With this information already in place, I had to assist the telecom manager in recounting the phones by each category. It was a daunting task, but it was necessary so that we can make sure that the numbers are correct. If it is off even by just 10-20 phones, it would affect the budget cost that is allocated into the project.

The next step to take was to get more information from each department as to how they want their phones to operate as to aid and enhance their workflow. Acquiring phones is only a part of the equation. What needed to be done was to get some feedback by the users. So, the managers initiated discovery sessions with each department of the hospital such as the Cardiology department, Emergency department, general surgery, engineering, and environmental department, and so forth. These discovery sessions were intended for both the IT department,

and the other departments to ask questions so that they can make configurations, and improvements.

A standardized questionnaire was made so that the essential questions were addressed. The sessions started with the CDW representative introducing the new phones, and giving an overview of the dial plan that will be implemented on the new system to support the whole of Mercy health. Some questions asked about any dial codes, voicemail, speed dial, and if they want their phone line to be directed to a specific phone so that it does not get in the way of the work of, say, a doctor or nurse. Questions asking about the transitioning of calls are the important ones since some of the staff employees are moving to the new hospital while some are still working in the current building. The template below shows how each phone was recorded into documentation per department.

Notes	Dept	Room	FirstName	LastName	User ID	DN	Phone Type	Config Permissions	Line1 DN	Characteristics	Line1 Mask	VM
	Workspace	BPE-712	RVD HelpDesk Tech 1	19		8811	LD		+18159711586		8159712930	N
	Workspace	BPE-712	RVD HelpDesk Tech 2	19		8811	LD		+18159711585		8159712930	N
	Workspace	BPE-712	RVD Support Tech 1	18		8811	LD		+18159711584		8159712930	N
	Workspace	BPE-712	Nick	11	Focci		8811	LD		+18159711583		815971XXXX	Y
	Workspace	BPE-712	RVD Network Tech 1	18		7841	LD		+18159711582		8159712930	N
	Workspace	BPE-712	RVD Network Tech 2	18		7841	LD		+18159711581		8159712930	N
SNR & Message Notificatio	Workspace	BPE-712	Dave	10	White		7841	⚠	+18159715999		815971XXXX	Y
SNR & Message Notificatio	Workspace	BPE-712	Derek	14	Hoaglund		7841	LD	+18159713144		815971XXXX	Y

Figure 2

It is clear that in order to develop, and manage a project, the process must be collaborative, and dynamic in terms of working in a team. The different facets of IT department have to come together so that they can divide the type of work, and they designate specialized tasks that can only be done by the specific area in which they are representing. This project allowed me to see how IT operates when they are in the process of developing projects, and how they can adapt to sudden changes in their environment. Unfortunately, there was a point in time during my internship that this project was slowed down because of the severe storm flood that occurred late in June. But seeing it come to its completion showed me how the IT department can adapt to a disaster.

Field Exposure

Job shadow

Having a more generalized internship description enabled me to be exposed to different areas in IT. I was in an environment where all the systems, and database admins did their operation, and allowed me to get an inside glimpse of how they operate on a day-to-day basis. Each person has their own workstation and have their specific role to play. I was fortunate to have job shadowed a database admin. He oversaw maintenance of the database servers. He does not specifically focus on writing SQL code since the data analyst, and warehouse specialist have that role. Most of the database admin's processes are automated through Windows server update services (WSUS) with Powershell. He utilizes WSUS to create scripts that will automate patch

downloads and installations, and scripts that can reboot servers.

Stored Procedure is a term used quite often in database. These are subroutine SQL statements that makes connections to relational database system applications. It standardizes the procedure so that it can be reused by different applications. These are set of queries planned and can be stored in cache. They can reduce network traffic and are much faster since they are in SQL server rather than application code. It can accept input parameters and return multiple values as output. This is beneficial for information being used in the organization since systems that are being used by the hospital needs to be responsive, and readily available. It alleviates the redundancy in multiple servers since the code is consolidated into a batch.

It is necessary that database servers are up and running just like any other systems that are integrated. The database admin sorts the server into primary, and secondary database servers. He said that it is good to cluster, or group servers together for high availability because they need to be up 99.99% of the time. The two node databases for each server instances, one being active, and the other passive, could be used to feed traffic in to the two servers. This system allows the servers to failover which means that servers transfer from active to passive when failure occurs in the primary, or principal server. Failback occurs when the server goes back to its active state in the primary server. The secondary server is the mirror server that receives the replicated data from the primary server. There could also be a witness server to check the read and write log of the transfer process between the two servers. Although, the admin warns that you do not want to failback right away. It is necessary that the primary server should be fixed and tested first before transferring back to its active state. If it is not done this way, there will be concurrency problems. Below is a diagram showing a simplified example of the transfer from one node to another before failover, and after. Clustering nodes, and mirroring servers increases availability, data protection, and improves the availability of the production database during upgrades. Partitioning large data sets from different tables within database servers can decrease disk space as well.

Figure 3

http://networksandservers.blogspot.com/2011/09/failover-clustering-iv.html
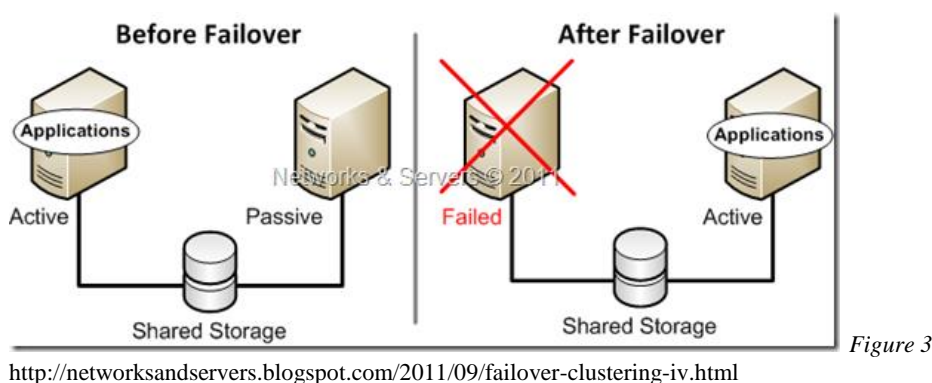
Job shadowing the DBA gave me an inside look on how they manage their servers. Not only was I able to do that but I also experienced being with the tech support. I was given the task to assist with imaging several HP t530 thin clients which cost from the ranges $400-$700. The desktop support manages all of the devices, and hardware the SCCM which stands for System Center Configuration Manager from Microsoft. It allows for remote control, patching, deployment, and network protection for services. The imaging process was automated using a

PowerShell script. We had to get through the NetBIOS to reboot each thin client and image them. Consequently, we had to deploy new zebra printers into different facilities and had to document each so that we could reserve IP address as we designated them in the network ports.

Network experience

Aside from job shadowing and helping with tech support. I was able to work alongside the network engineers, and architects of their IT. I have always wanted to learn hands-on experience in network and apply the theory behind it that I have learned in classes. I was able to sit down with the network engineer, and get an overview of their network topology, and at the same, refreshed my memory of what I have learned before. Their network topology is based by geolocation. The old building that we were in uses OSPF while the Janesville site in Wisconsin uses EIGRP which means that their routing is dynamic. That infrastructure can cause complications since they need to ease communication between the sites. They had to standardize the network infrastructure by route summarization, or consolidation, and redistributing them meaning it will convert static or manual routing to dynamic ones, or vice versa.

I had the opportunity to work with them in assembling switches and stacking them to make configurations so that they are prepared for activation in the network closets located in a separate clinic of the hospital. We installed and mounted the Cisco switches in the network racks in the clinic. On top of that we also had to calibrate and configure the security server called Genetec for the security cameras in the clinic. Because of the merger, new sites are being built, and the network infrastructure is being altered in the process. Like I've mentioned previously, more projects are in development due to the big change that is happening in the hospital, and within the IT department. The network closets also had to be established in the new main hospital building, and the network team are on the move to the different locations, and are most of the time, not available in their offices. Working with the network admins gave me experience, and insight on what their line of work entails. Network Theory, and administration is an old branch of Information Technology, but it is still the fundamental foundations of any type of organization that requires connections between computer hardware, and servers.

Disaster Recovery

Creating a recovery plan should be a necessity for any organization. A large-scale organization that depends on information systems like MercyHealth will have to make contingency plans for a likelihood of a disaster whether it is a fire, or power outage, or severe weather conditions. An organization that size cannot afford losing their services, and resources when they rely on them every second of every hour when they are dealing with patients' lives. Doctors, and nurses' workflow cannot be halted, and if a disaster surfaces then the IT department will need to strategize and come up with recovery procedures.

Storm Flooding

During the last weekend of June, the hospital was hit by a severe storm flooding, I was

not there when it occurred, but it affected the most vulnerable facilities. The IT department is located in the basement, and it is where all operations happen. The main data center which houses all the physical servers which amounts to millions of dollars. The data center well elevated in relation to the basement floor yet it was still reached by the flood. The flood was about 6 inches or more above the floor, and a few blade servers that were placed at the very bottom tier of multiple racks short-circuited and were lost in the process. The flood reached all the offices where all the database, network, systems, and web admins were stationed. A lot of hardware were lost. The desktop support which was in a room next to the admins was affected as well. This room had all the inventory for cables, monitors, thin clients, and other computer hardware. The desktop support, and telecom had to move out to the first floor in the same room as accounting. The admins were working remotely since the bulk of their work can be done virtually. Fortunately, the programmers, and analysts were not affected since they were located far enough that it wouldn't.

Recovery

The hospital went into drastic changes, but they had to evacuate all equipment in the basement so that they can be undergo major maintenance. It turns out the reason the flood reached to that level is because there was leakage to some old pipes in the walls. The building that got affected the most was the oldest. The hospital most likely didn't foresee a storm would penetrate and cause a major disaster since if they did they would have made some improvements in the structural integrity of the building. Even amidst the loss of resources, there were still actions that can be taken to lessen the impact. There were still a few equipment that could be salvaged, and potentially be of use again.

The role that I had to take in this was to assist in any way possible in the recovery process. I had to help the network team with checking each network closets if there are any of the PDUs that are still functional. We found one, or two that were still available for use surprisingly since the water clearly got to it but most of them were destroyed in the other closets. We could tell that how high it got up in the racks because of the damp markings on it. We had to also double check all the network ports, and cables if there were any that were affected as well. These were the Tripplite ATS PDUs, and other switches that we had to remove from racks.

Figure 4

Aftermath

Even as I left the internship, IT was still in the middle of recovery process. The basement was still being renovated, and most of the staff employees couldn't go down, and work there because of the hazard, and the place is just not the best for a work environment. A few months after I left the internship, I have heard back from the director of the Information services that the help desk has moved back to their home in the lower level. Although it is not completely back together as of currently, it is enough to continue their day-to-day services, and operations. The Networking team and system administrators are still working from temporary locations or from home. Some of the members in the tech support team are spending most, or all of their time in the new hospital site that will open soon next year. The lower level of the hospital is open again but not fully functional. The director thinks that they at the point in the construction project where it seems like they have made huge progress in terms of reverting back to their normal state.

Lessons Learned

Throughout this internship, I have learned many things besides from technical knowledge. I have also gained insight that I could apply in my future career. I have learned that in order for a team to create tangible products, and results, they need to be cross-functional, and they have to be open to different ideas. It is hard to do that in an IT environment because of the skills can be very specialized but one can get past that by including considering every idea in the team. I have learned that not all of IT is going to be the cutting edge of technology. Some of the most basic elements that are needed in an organization are the ones that are enough to sustain it. I also learned that it is not always about asking for a task, or a project to take on. It is about the quality of work, not the quantity. In the process of this internship, I have also learned basic PowerShell scripting which is essential in the systems that they have put in place since they are Microsoft, and .Net based. And these are lessons that I could apply as I move forward in the field of IT.

Conclusion

This internship gave me a first-hand look on how different areas of IT can come together, and create cohesion, and integration. This is apparent in the way they develop and manage projects. Multiple projects cannot be managed so easily without the collaboration of a team containing individuals who belong in their specialized areas. I had the privilege of working with network engineers, and admins, and tech agents out in the field, and was exposed to the way they operated. I saw how they went about procedures, and protocols. Lastly, saw how IT, and other facilities responded to a natural disaster, and how they planned, and executed recovery measures. An structure of IT might be different for each organization but the core aspects of it will never change. One aspect of IT cannot operate on its own without the influence of another. If a part of IT isolates itself, and does not let data, and information out, that would be called a silo. And silos hinder an organization from progressing, and there is no way for IT to become that since every facet of its existence interdependent. Network supplements servers and hardware, and servers supplement data, and data supplements users. This could go in various directions but information technology cannot operate as a whole without interacting with one another.

References

Failover Clustering (IV). (n.d.). Retrieved from
        http://networksandservers.blogspot.com/2011/09/failover-clustering-iv.html