Mathematics and Computer Science Capstones

Mathematics and Computer Science, Department of

Summer 8-31-2015

The Challenges of Integrating New Technology into an Organization

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Introduction

      To remain competitive in a global economy, businesses need to adapt to an ever changing environment to meet their customer's needs. Staying competitive means continuing to evolve as an organization and making changes to both process and technology to gain a competitive edge over their competition. Organizations must become adept in bringing in new technology and managing the challenges that go along with implementing the change. Changes of this nature can provide significant benefits to an organization but can also present many challenges that need to be managed to yield a positive outcome. Problems arise when organizations attempt to bring in a new technology without proper management and training for their employees'. Using case studies from the New Jersey Division of Gaming Enforcement (NJDGE) and ALMAC Clinical Technologies (CT) along with peer reviewed research, this paper will assist in describing the benefits and challenges of managing technological change, training considerations and the impact that it can have to an organization's staff.

Benefits of Change

      Technology change has been beneficial to both organizations and its employees. The adoption of technology innovations by organizations has exploded over the last few decades with global spending on technology across all industries reaching an estimated $2.6 trillion (Schraeder, 2008). This growth had been in large part to the use of the internet which has increased by over 200% between the years of 2000 and 2007 based on statistics from Internet World Stats (Schraeder, 2008). In general, technology change can bring increased efficiency, improved quality, assist in bringing products to market quicker and expand the skill set of employees'. Technology can also bring benefits such as improved communication, reduced costs and help foster new innovations. Additional benefits may be seen depending on the specific type

of technology that is being implemented. Organizations such as the NJDGE and ALMAC CT can and will benefit from adopting new technology. In the case of the NJDGE the adoption of a tool that will help them analyze large data sets quickly and efficiently is the change that is needed to benefit their organization. For ALMAC CT, a technology solution that will allow them to test their systems in an automated fashion is what is needed to increase their productivity and improve the quality of their systems.

With organizations moving to things such as telecommuting, technology can increase participation and involvement with remote employees. Technology can expand the potential pool of participants that are working and collaborating together on projects through shared databases, on internal intranets and the internet (Schraeder, 2008). Technology solutions now allow the ability to overcome the limitations of remote employees providing the ability for individual participation and input from all over the world regardless of location. This benefit allows for employees to work at times that are more convenient for them but still provides for collaboration and communication across a team.

New technology can also help organizations stay more in touch with their market. Rapid changes in the economic landscape of today's business environment require action to meet customer expectations. Failure to stay current on customer needs and market changes could result in the loss of any competitive advantage an organization may possess. Additionally, keeping current on the latest technology could allow an organization to seize any possible opportunities that are not being filled by a competitor. As stated by Venkatraman and Henderson in 2004, Information Technology should help organizations understand their position in relation to their competitors, learn about customers, monitor relationships with suppliers, and control

strategic objectives (Affeldt, 2013). The use of new technology can help make a business more agile and adaptable to the changes going on in their particular market.

The addition of new technology can also benefit an organization by helping to shape its strategic vision as well as helping it to gain a competitive edge on their competition (Norton, 1995). Having a strategic vision will help to focus an entire organization on what they are trying to achieve and what their goal is. Doing so will create a competitive advantage that will lead to increased sales, profits and an increased market share. This benefit (strategic vision) also extends to the staff of an organization by communicating where it is going and how that technology is going to help them achieve the vision.

This paper will utilize two case studies to demonstrate the benefits and challenges of introducing new technology into an organization. Each of these case studies had aspects of them that matched the research as well as aspects that did not. For the NJDGE the technology that was introduced into the organization was a business intelligence tool to replace the analysis that was being done in Excel. At ALMAC CT an automated testing tool (HP Quality Center) was brought in to improve their quality and the speed at which they can build new systems.

Case Study – New Jersey Division of Gaming Enforcement (NJDGE)

In the New Jersey casino industry a vouchering system is used in place of real coins. A voucher resembles a coupon, with the following information: the dollar value of the person's winnings, a barcode, date, casino name, slot machine number and time stamp. An unverified voucher is defined as a voucher that the barcode on it, is not recognized by the data system used in a casino. When an unverified voucher is in excess of $1,000.00, it must be researched by the NJDGE and casino accounting department. An unverified voucher investigation is completed by the NJDGE to check the data integrity of the casino's vouchering system. In most cases the

patron that submitted the voucher is not at fault, unless it is determined that the procedures in place are being abused by one patron.

The focus of the new technology is to addresses three problems that occur when conducting the above investigation, which are the analysis, collection and preparation of the data. In order for an investigator to collect the data for analysis, a slot data system housed within the casino is accessed. A slot data system is simply defined as a legacy database that records all of the wagers, wins, and losses electronically in one repository. The details are captured in a text file that is pasted into an excel file for analysis. The formatting of this data is completed by placing a date column in the excel spreadsheet, and then using the text to columns option offered in Excel. When all formatting is completed the investigators manually extract the following information: currency in, vouchers redeemed and promotional credits used that are offered by the casino to the players to calculate the players' win/loss amount. The final analysis of the data within the excel spreadsheets happens when the investigator compares the manually calculated voucher to the amount of the voucher recorded by the slot data system.

Case Study – ALMAC CT

ALMAC Clinical Technologies is based in Souderton, PA and develops interactive clinical trial management solutions for the pharmaceutical industry. It was founded in 1995 under the name ICTI (Interactive Clinical Trials Incorporated) and then purchased by the ALMAC Group in 2005. Almac provides software solutions for both voice and web response systems that have been trademarked as IXRS. These response systems assist in running clinical drug trials, allowing for patient randomization while assigning drug and inventory management. Pharma, Biotechnology and contract research organizations are ALMAC Clinical Technologies' primary customers. Currently, ALMAC Clinical Technologies runs over 250

clinical trials that operate 24 hours a day, 7 days a week. On an average, ALMAC is adding 15 new trials per month to its roster. This volume of work demanded greater efficiency in building and maintaining these new systems. The build methodology followed at ALMAC is the classic waterfall system development lifecycle. After analyzing their methodology, it was determined that the manual style of testing they were following was inefficient and needed improvement. This process involved using a word document to create test steps that were then run in a manual fashion. This methodology had been used at ALMAC since its inception and was part of the culture. In order to increase capacity and efficiency a new testing tool was brought into the organization. The tool that was selected was HP Quality Center, which is seen as an industry standard in software testing. This tool will provide ALMAC with the efficiency and the flexibility that ALMAC needed in a testing application. With the continued growth of their business the need to update their testing process and increase capacity was required if they wanted to maintain their competitive edge over the competition. This new tool will provide them with the advantage they require to maintain their market share and seize new opportunities that were previously not able to take advantage of prior to the addition of the new technology.

Process Improvement Benefits

As organizations look to improve their market position, more creative and effective methods are required to assist them in improving their processes. Improving processes often means changing them or creating a new one altogether and technology can assist in making these improvements. In the case of NJDGE an example of a technology that can assist in improving their process would be a Business Intelligence tool. BI tools assist with the analysis of data and help to identify areas of an organization that need improvement. These tools also assist in monitoring changes once they have been completed. Once a change has been made the BI tools

can then track the differences in the data after the change to determine if the improvement had the anticipated effect or was a failure. Organizations can then continue to make improvements in this manner of doing analysis, making improvements and then monitoring the changes. Following this continuous feedback loop leads to a competitive advantage. For an organization such as ALMAC CT, a new testing tool was required to improve their ability to test their systems in an automated fashion instead of doing things manually as was the custom there. This tool will allow them to bring systems to market faster, take on additional work and improve their quality. These are just two examples of how new technology can benefit an organization. Once an organization has created a culture where managers and staff solve problems using technology they will turn to more information technology solutions when faced with challenges (Reimers 2014). Both the NJDGE and ALMAC CT continue to invest in new technology to assist them in improving their processes as well as allowing them to become more efficient and deliver better quality products and services.

Resistance to Change

Change is an unavoidable phenomenon within the business world. It arises from the dynamics of the environment organizations operate in and is required for an organization that wants to flourish. To remain competitive, it is essential for organizations to be able to upgrade their tool set on a regular basis and have these changes accepted by staff. There are many items to consider when bringing new technology into an organization. It is important to note that altering staff behavior is a long term objective and change cannot be forced on employees overnight, it is key to provide them with the context for the change so they are able to understand the need for it (Croft and Cochrane, 2005). Gaining acceptance at the staff level can be a challenge as getting buy-in by the employees' who are going to use the new technology can be

difficult to manage.   Introducing changes within an organization can cause disruptions in patterns or behaviors that can cause loss of continuity, replace customary social structures and familiar relationships (Agboola, 2011). Bringing on new technology can be intimidating for employees' who are content in doing things as they have always done them. Adopting new technology can mean changes to job responsibilities, added work load, additional training and personnel. Technology changes of this nature can also impact the politics of an organization. Those who possess certain skills and abilities may see change as a threat to their positions and undermining their job competence. Changes of this nature also have the potential to impact relationships and change behavior patterns of employees'. Resistance to change can also come from an unexpected source, management. In some situations managers who should be champions of change, may see it as a threat to their position within an organization. When changes are directed by senior level management, middle managers can find themselves in a similar position as their employees and begin to resist the changes that are being pushed down to them. Managers in this position are uniquely positioned to either have a negative or positive effect on the change being made by encouraging employees to either resist or accept the change being implemented.

Technology changes can also impact the nature and culture of an organization. Changes have the possibility of impacting an employee's job responsibilities, which can create feelings of uncertainty. The uncertainty of what new technology means for employees' can trigger more resistance to their acceptance of it. Resistance can also come in the form of attachment to old processes and legacy tools that employees are comfortable with. Employees can become accustomed to a situations that are not the most beneficial and will strongly resist any suggestions to change it (Caruth, Middlebrook and Rachel, 1985). Technology change is more than just brining in a new tool or piece of software, it is also changing the behavior of

employees' that can be content with a given way of doing things and resistant to changing what they are used to. Human discomfort with change is really based on the fear of loss. The fear of the unknown sometimes is worse than the actual change itself and employees can let these fears cloud their judgment about the benefits that a change may bring for them and an organization. Causes of these fears can come from feelings of uncertainty, lack of tolerance, differences in opinion and threatened self-importance. According to Carr "resistance to change is mainly an effort to maintain the status quo and resistance is a behavior put up to protect an individual from the perceived effects of a real or imagined threat" (Agboola, 2011). To help manage change effectively and reduce the resistance of employees to change, organizations should have a mechanism in place to introduce and control the changes so they are able to avoid production or morale issues. Research done by Benamati, Leader and Singh in 1998 showed that the fear of new technology kept employees from using it to the fullest extent. Instead of embracing the new technology only the minimum functionality required to use it was learned to apply it to their work. Additional research also suggests that promotion-focused employees would maximize their ability to master the new technology on their own, because it would provide them with a sense of achievement and accomplishment where as a prevention-focused employee would be reluctant to separate from their normal routine to learn new technology own and procrastinate in adopting it for fear of not having enough time to get their assigned work completed (Halvorson, 2011).

Gaetz described resistance to change as "barriers arising from organizational politics, inappropriate use of power, challenges to cultural norms and institutional practices, lack of understanding, inappropriate timing, inadequate resources, incorrect information or employee suspicion of honorable management intentions" (Agboola, 2011). In most cases resistance to

change is a negative force and does not always surface in standard ways and can appear in various forms such as being overt, implicit, and immediate or deferred in nature. Resistance to change is part of human culture which can be rather inflexible at times. This inflexibility influences people's behavior and efforts to make changes creates natural resistance in people. Resistance can often times reveal itself in what can be thought of as deviant behaviors in employees. These behaviors may at times be aggressive or hostile in nature and are directed at an organization. Individuals can be seen as acting defiantly if they defy the social norm in a given culture. Forms of this behavior within an organization can be things such as absenteeism, sabotage and gossip. Research done by Werner and DeSimone in 2008 described 4 specific types of defiant workplace behaviors that include "production defiance (leaving early or intentionally working slowly); property defiance (sabotaging equipment, lying about hours worked); political defiance (showing favoritism, seeming or gossiping about a co-worker); and personal aggressions (sexual harassment, verbal abuse, endangering or stealing from co-workers)" (Agboola, 2011). Behaviors of this nature are the manifestation of employee frustration with the the changes that they feel are being imposed on them and can threaten the success of the change being made as well as the organization overall. These behaviors must be identified and managed to prevent employees from becoming disengaged with the changes or technology being introduced causing them to fail.

There are cases when resistance is actually a positive force when changes are occurring. Resistance is a form of conflict and conflict has been found to strengthen and improve decision quality as well as the follow through and implementation of decisions (Ford, Ford and D'Amelio, 2008). Resistance of this form can cause management to rethink changes that may have not been thoroughly considered. It can also engage employees in assisting management in determining the

best path forward to effectively implement a change. When it is authentic, positive impact can come from what is considered a negative behavior. Organizations that dismiss this form of resistance can miss the opportunity to provide strong justifications for the changes that will help employees support the change that is being made and risk problems when implementing future changes (Ford, Ford and D'Amelio, 2008) This form also has the ability to alert an organization to the warning signs of a change that has not been fully vetted with all possible impact considered. Resistance can also create a common interest within staff and serve to assist in building a more cohesive team within a workforce.

Because all behavior is self-centered most people will accept changes that they understand and believe to be beneficial to themselves (Caruth, Middlebrook and Rachel, 1985). Management needs to be aware of employees' thoughts and feelings on the technology change and address them appropriately. Behavior and emotions around changes can be heightened and drive employee behavior. This behavior should be monitored by management and addressed to prevent any decline in morale. When management takes the time to address these concerns and show they are listening, staff is more likely to get behind the change and be supportive. This helps to gain buy in and not can prevent staff from feeling like changes are simply being imposed on them. Having this type of communication allows for concerns and fears to be addressed early instead of being pushed off to a later point where small problems can become large ones.

At ALMAC CT the resistance that was encountered mirrored the research. Employees did not want to change how they had always done their work and did not want to utilize the new technology that was being brought in. The typical statement heard was "Why do we have to change, the way we do things now is fine". Staff was fearful of trying to learn a new tool and

complete their daily work at the same time. Staff at ALMAC was vocal about their concerns and were not shy about how they felt about the changes. Resistance in this case was not hidden as some research has shown. Other than being vocal, employees used the new tool as they were instructed by management, not because they felt it would help them complete their daily work or advance their careers.

For the NJDGE case study, the resistance to change supported the research. Employees did not want to use the new system. They felt it took too much time to learn, and yielded minimal efficiency. They were more apt to maintain to their normal routine to conduct investigations, than optimizing the tools in the new system. Employees were vocal but not to management. Most employees shared their reluctance towards the new system amongst co-workers within their unit. The other statement heard around the organization was "if it isn't broke why fix it." After being pushed back to the new technology employees used it because they were told to, not because of the advantages it would provide to decrease the time spent on a routine investigation. Eventually, employees discovered the effectiveness of the new system in their day to day operation and began to praise the new system instead of complaining about it.

Technology Change Management Implementation

Once an organization has selected and approved a new technology tool it must be implemented and introduced to employees. Organizations failing to introduce their planned changes successfully can pay a high price that could lead to lost market position, credibility with stakeholders, decreased staff morale, and loss of key employees (Edmonds 2011). When embarking on a technology change that will impact an organization, a great deal of thought must be put into the implementation of that change. Successful implementation of technology change

requires visionary leadership that has considered the benefit, consulted with influential leaders at all levels to identify unintended consequences, identified sources of resistance, and developed a detailed plan to foster the implementation over time (Luo 2006). Spending the time to carefully create a well thought out plan for implementation is the key to success. Thought should be put into demonstrating how the new technology will serve all staff and not just management. Failure to communicate this to users may cause the implementation effort to fail despite considerable time and effort spent on the roll out.

In the case of ALMAC the implementation plan was not well thought out and negatively impacted staff and the quality of their product. Time was not allotted for items such as communication and a robust training regimen. This impacted their ability to effectively roll out the new technology as described in the ALMAC CT case study.

In the case of the NJDGE the implementation plan was not shared openly with the employees that would be utilizing the new technology which added to staff negativity and their resistance to the new technology. Research has shown when the routine of an employee gets disrupted by a new technology tool with minimal warning, they experienced a sense of anxiety before fully understanding how the new tool can help them. This is what was seen in the case at NJDGE. Sharing the implementation plan would also have provided an alert to the employees that they would have to use time in their day to day operation to learn the new system. Although, staff members did not fully accept the new system at first, it did not impede the rolling out phase.

Staff Impact – Communication

The implementation of any new technology should be communicated to staff. Items such as status, benefits, training and expectations should be clearly provided. Along with the "what" of the change, the "why" should be emphasized to provide staff with an understanding of the

changes that are going to occur and what will be expected of them. To do this effectively the nature of change should be defined and why it is important to the users and is helpful if this definition explains how the change will affect the individuals both personally and professionally (Ryan 1992). This message can be provided in various ways depending on the organization and methods they have for communication. Information about the change can be provided through things such as email, newsletters, the company website, staff briefings or town hall meetings. The communication about the changes should also be tailored to the different levels and roles within an organization as each will react different to the changes that are being made (Croft and Cochrane 2005). Open communication between managers and employees is an important part of making a technology change and should be encouraged. Research has shown that employees want to hear about changes directly from their manager so it is vital that open communication take place between management and their employees (Croft and Cochrane, 2005). Having an open dialog like this can help to get employee "buy in" and reduce the amount of resistance to the change being made. Getting people talking about the reasons for the change and allowing them to express their views will more than likely get the required backing from employees' for the change that is going to be made (Edmonds 2011). Additional benefits of this communication will allow staff to see how the change and new technology can improve their jobs. Demonstrating the "what's in it for them" aspect of the changes can help improve employees' outlook on the impending change and reduce some of the anxiety that can come along with the unknown and a new way of doing things. Managers need to provide justifications for why the changes are being made, why they are appropriate and the rationale behind them to create readiness for the change to increase the likelihood of employee acceptance and participation in the changes (Ford, Ford and D'Amelio, 2008).

The communication for the changes that were introduced at ALMAC did not follow what research has shown to be the most effective methods for communication change. The announcement for the technology change that took place at ALMAC was done during a department meeting with no time for employee questions or concerns. Research suggests that communicating changes to employees by their direct manager is a more effective than in a larger group meeting as well as providing time for questions. As the tool was rolled out for use it became evident that staff needed to have more open communication with management and these meetings eventually took place. The delay in having an open forum for discussion did slow down the new technologies acceptance and effectiveness.

The NJDGE did not have a well thought out communication plan to present to the employees. The communication consisted of informing employees a new system would be used to acquire slot data from the casino systems. Specifics on training, how and what was being implemented was not communicated by upper level management. Employees made inquiries to both management and the Information Technology Department about training on the new system but were met with vague and untimely responses. This lack of communication aided in the resistance of the new technology at first but was eventually accepted by staff members after continual use, and training.

<u>Training</u>

Once the decision for change has been made and the change has been communicated to staff, the actual training on the new technology needs to take place. Before this training can be delivered it must be designed and created. The design of the new technology training should take several items into account. These items include; staff experience and skill set, complexity of the changes they are being asked to learn, time it will take to learn the changes, and the amount of

time that will be provided for the learning to take place. With all of these items to consider, training designers must understand both the needs of the business and the needs of employees. It is a best practice to complete a training needs assessment to determine what the training planed needs to cover and what should be considered for future training as this is something that is often neglected when creating a training plan (Llorens, Salvano and Grau, 2003). Trainers should work closely with the technology managers to define the overall goals of the training, what the training should include, how it should be delivered, and when it should be delivered. What this really means is it should be clearly defined what individuals going through training should know once completing it. Success should also be defined around employee training experience. Evaluations should be done to determine if training has been a success from an employee standpoint. The extent and quality of technology training can directly impact employees' intentions to use the technology, as well as their attitudes and beliefs about how useful it will be to them (Marler, 2006). Evaluations could be in the form of surveys, questionnaires or group discussions. Acquiring this type of information can assist in improving training and the understanding of employee needs and perceptions of the new technology. These evaluations are critical to improving or redesigning the training and should be part of the training plan. After the training goals have been set, the creation of the training and delivery methods can be decided upon. One of the first items that should be thought of when designing the training is what skills and knowledge do the trainees already have that can be leveraged to assist in the design? The training should also consider how long it will take staff to master the new skills. In some cases, complex components should be given in multiple training sessions to spread out the learning (Marler, 2006). After the "what" of the training has been defined, how the trainings will be delivered needs to be determined. Training designers should consider the best way to deliver the training to

staff. Delivering training on new technology can be done in multiple ways. Depending on the technology that is being changed, different methods of delivering the training may be used. In some cases a simple Power Point presentation is appropriate, in others it may be best to have a more formal hands-on training in a classroom setting. In other situations, self-study through e-Learning might be the preferred method of training staff. The important point is to fit the training methodology to the technology that is being rolled out and facilitate learning by employees.

A final component to the training plan is to determine when the best time is to deliver the training to staff. Factors that can determine this are, the extent of the training materials, and the method that is going to be used to deliver the training. These items will help to define when the optimal time is to deliver the training to staff. There is no defined rule when the best time to deliver technology training to an organization. Research has shown that after employees have engaged in formal training, and have had the opportunity to utilize it prior to its full implementation, training decay can be reduced (et al Arthur, Bennett, Stanush, &McNelly, 1998). In addition, learning retention is facilitated and better training transfer will take place when this method is implemented (Marler, 2006). Learning retention can be increased if time is spent practicing using the new technology. Trainers should encourage staff to use the newly acquired skills during and after training has been completed in order to become proficient before the new technology is implemented.

An additional aspect of training that cannot be overlooked is the trainability of an employee. This part of training is often times overlooked and what it really means is the ability an employee to carry out continuous training throughout their professional careers and their motivation to do so. Trainers have limited ability to impact this as it resides within each

individual employee. These attitudes towards training can have an impact and employees ability to successfully absorb new technology and adapt to change (Llorens, Salvano and Grau, 2003).

The new technology training at ALMAC did not follow the steps that research has shown to make training most effective. A training assessment and plan were not created around what staff needed to effectively use the new tool. Training sessions were too brief and not scheduled at the appropriate time for employees to benefit from the learning they attended. The other critical aspect of training that was overlooked was the absence of post training evaluations to improve upon what was presented. Only after the difficulties that staff had with the new technology were meetings held to discuss what was needed to successfully use the new tool.

The NJDGE experienced similar outcome to the research regarding the administration of training.   At first when employees were left to train themselves and experiment with the new technology, time to complete investigations increased. Staff were busy trying to understand how to utilize the system by using the user's manual. This slowed productivity, because employees were unfamiliar with the new technology. Once a formal training class was provided, staff modified their routine to accept and utilize the new technology. This in turn increased productivity and achieved more consistency on how information was presented and written in the investigative reports.

Successful technology training should be developed in conjunction with technology managers by first creating a training assessment, having set goals defined for what the training should accomplish, defining how it will be delivered to staff, and allowing enough time for training to be delivered and practiced before implementation occurs. Finally training evaluations should be completed by employees to determine if the training needed to be improved or redesigned

Handling Conflict

Internal conflict occurs in an organization when a change such as managerial, technological, sociological and economic, takes place. Typically, when bringing a new technology into an organization, a proposal is created, reviewed, accepted and executively approved before work can begin. Preparation includes original research for the new technology, including documenting why the business needs the new technology and how it aligns with the goals of the organization. Preparation should incorporate a comparison of the tools being researched including the pros and cons of each new technology. A proposal provides details of the support provided by each new platform. Preparation of a proposal should also include estimated and contingency costs. If the team working on the proposal is not able to agree on the best technology for an organization, a conflict will arise. A difference of opinion amongst team members may cause delay and possibly break down the lines of communication. A corrective action could be to gather the perspectives of each member of the research team and develop an outline the team approves in order to complete the project at hand. The new outline should be presented to upper management and stakeholders for final approval. Once this is completed, the project would get funds allocated and the project team may begin working on the first phase of the project.

To help curtail conflict, the new technology selected needs to satisfy the requirements of all departments within an organization. According to research done by Gollapudi, Jangeti, Kotapati in 2012, there are ten attributes which should be taken into consideration when new technology is being chosen to assist with this. Any one of these attributes can be a source of

conflict that must be discussed and managed to reduce their impact on an organization and the technology change they are implementing. The 10 attributes are; usability, interoperability, common business views, agility, scalability, reliability, openness, manageability, infrastructure and security (Gollapudi, Jangeti, Kotapati, 2012).

Any one of these 10 attributes can cause conflict within an organization due to employee reaction when implementing new technology. To circumvent conflict, a variety of strategies should be used by an organization to mitigate the impact. As mentioned earlier in this paper, open communication should be utilized to reduce the possibility of misinterpretations about what the new technology will do and how it will assist employees in their job responsibilities.

It is important to remember that not all of these 10 attributes will occur within an organization as was the case for both the NJDGE and ALMAC CT. The following attributes were found to be the sources of conflict when new technology was added to the organizations described in the case studies. The first attribute that posed a challenge was the interoperability of the new technology. At the NJDGE interoperability was a source of conflict. Interoperability is defined as a single interface for all of the functions of the tool and must easily navigate from one function to another without entering into a different platform (Gollapudi, Jangeti, Kotapati, 2012). For example, if an organization decided to bring in a reporting tool to gain consistency with how data was analyzed and reported on, it would need to have interoperability. The tool would have to be available to multiple users across an organization and would need to be used by varied job functions that would all have different requirements for use. Ensuring that all users were able to have the features they needed can be a source of conflict that must be managed appropriately to gain user acceptance. The greater the interoperability the technology has the more cost effective and useful it will be to an entire organization. For ALMAC CT the scalability

of the new technology of the technology was one of the causes of conflict. This is an important concept as organizations continue to expand globally. This means that technology tools must be capable of supporting employees in multiple locations. If the new technology fails in this regard, the organization will not be able to achieve or maintain a competitive advantage in its industry. One commonality that between NJDGE and ALMAC CT were the issues they both experienced with their organizations infrastructure. This attribute is the ability an organization has to utilize their existing infrastructure to incorporate the new technology. Using an existing framework can reduce some cost however issues may arise with existing hardware or software incompatibility. Any parts of the infrastructure that are compatible with the new tool should be reused to save on the costs and reduce the addition of new components.

To expand further on the ALMAC CT case study only two of the 10 attributes cause conflict when trying to implement the new technology. The first and most costly were the infrastructure changes. Systems needed to be upgraded to match the requirements of the new tool (HP Quality Center) so it could be utilized by staff. This caused many meetings and discussions by ALMAC CT upper management with ALMAC Group as the board of directors did not want to spend the money on the tool it and the needed infrastructure changes. Eventually it was decided that the tool was worth the added cost and increased quality it would bring for ALMAC CT but the licenses would be controlled by ALMAC Group and not ALMAC CT as well as the upgrades to the system so cost could be monitored. The second of the attributes that caused an issue for ALMAC CT was the scalability of the tool. The cost here was not in dollars but came in the form of resistance and fear of using the new technology. Because 50 plus employees needed daily access, ALMAC CT needed to have enough licenses for each employee to use the tool. Each employee needed their own license as they could not share the licenses and this would limit

the number of employees that could be working at any given time. When the tool was first rolled out employees were met with not enough license messages by the tool and were not able to use the tool for work which quickly became a point of frustration and increased their resistance to utilize it. Individual reverted back to the older process so they could complete their assignments on time. This caused tension between management and staff and who were pushing employees to use the tool for their daily assignments. To help ease these tensions ALMAC CT management needed to ask ALMAC Group to purchase more licenses for the tool. This process took several months as the value of these added licenses was hotly debated in senior management meetings. Meanwhile staff was struggling to learn and use the tool. Eventually additional licenses were purchased but the damage had already been done and fear of the new technology had taken hold. Staff members were vocal about not wanting to use a tool they could not access and didn't fully know how to use and still meet their timelines. Middle managers continue to struggle with gaining acceptance of the tool due to these delays and negative feelings staff created because of these issues. If ALMAC CT had better managed the conflict that occurred in senior management meetings due to these two attributes implementation would have been much smoother and cost both monetarily and to staff would have been greatly reduced.

For the NJDGE the attribute that they were able to leverage was infrastructure. In their case they were able to utilize the existing hardware can save on costs and time for implementation which removed the possibility of conflict around cost. The ability to utilize its already existing, routers, servers, and switches located in each casino, allowed them to easily convert over to the new technology. Costs were saved because hardware did not need to be upgraded and existing computers were able to handle the change. The additional cost that was incurred was due to some of the NJDGE's field offices in the casinos needed to have additional

fiber optics run to handle the increased data traffic. Also some added costs were incurred because the operating system in all of the NJDGE computers needed to be upgraded from Windows XP to Windows 7. The other attribute that was encountered was interoperability. All areas of the department were required to have a single interface for employees to use even though they had different job functions. This caused conflict and disagreement between the various groups within the department who wanted their own view or did not want other groups to have access to theirs. Eventually it was agreed upon to share a common interface that contained all the functionality that each group required.

At first, new technology may slow down production until employees become accustomed to using it.   When an employee becomes comfortable with the new tool and establishes a routine in using it, efficiency should increase. Schraeder, Swamidass, and Morrsison state, "It is easier to implement change that can be viewed positively by employees than that which is viewed negatively" (Schraeder, Swamidass & Morrisson, 2006). Tool choice becomes more successful when departmental requirements are shared across an organization, and business goals are aligned with its selection. The tool or small selection of the tools must have the ability to be customized for each department to meet their specific needs without having to use more than one system. A method for avoiding conflict would be to release a subset of the tools functionality which could be mastered before the full solution is launched. Ideally the tool selected should be easy to use at all levels of the organization, and must provide useful reports to assist in the decision making process of the organization. The proposal for new technology should be accepted at all organizational levels and all departments in order to increase the chances that it will be approved, accepted and implemented.

Generational Concerns

Diversification of staff is an important concept to address when managing the implementation of new technology. There are four different generations in today's work force which consist of the "Baby Boomers" (1946–1964), Generation X (1960–1980), Generation Y (1975–2000) and Millennials (1995–2009) (Abrams, 2014). Each of these generations have characteristics that defines them however people all have unique experiences that will influence how they learn and behave in the work place. Managers and training designers need to take these differences into account when making changes, creating a training plan, and communicating information out to a multi-generational work force. Each of the groups have different needs when it comes to training on new technology. Individuals that are part of the Baby Boomer generation do best when in a classroom environment that is made up of exercises and open discussion, and can do very well learning new technology but need to have the amount of information they are given controlled so they are not overwhelmed. Generation X'ers also prefer to be in a classroom setting and do well with exercises and discussion but have a tendency to not respond well when trainings are lectures only. They will ask many questions and need to have very clear direction or will create their own process. Generation Y'ers do well in both an individual and group learning environment and are very comfortable with technology change. They tend to be more engaged in the most recent technology and when faced with problems will seek out solutions on their own as opposed to the other generations. Millennials are the most advanced technologically of the generations in in today's work force. This group is very versatile and can learn in multiple formats and is the most comfortable with Training in an e-Learning format, Skype and virtual trainings applications allow this group to interact with one another while being taught in the electronic environment they are more comfortable with (Cekada, 2012).

It is important for organizations to understand the differences in the various generations to assist them is managing how they roll out changes and communication to employees so they can ensure the changes will be successful and the communication will be heard.

ALMAC CT has a multi-generational workforce and as research has shown the various groups needed to be provided with training variations for the new tool that was being brought in. The other aspect of the generations played out just as research has shown it to occur in other organizations. Employees who are part of Gen X asked the question "Why are we changing, the old way of doing things is fine" while the Gen Y'ers and Millennials, could not wait to get the new tool and learn how it could help them improve and took on additional learning on their own. The NJDGE was established in 1977 and is a fairly young division within the state of New Jersey. Even though they are considered a newer division they still contain a multi-generational work force. As suggested by the research the various generations had different reactions to the new technology when it was introduced. The leaders who are mostly part of the baby boomer era, welcomed the technology change. They asked questions about the new technology, such as how it would affect productivity and what type of training will take place. The leaders, who are part of the baby boomer generation, suggested a more structured classroom experience for training. This mirrored the research as this has been shown to be what baby boomers find most comfortable when learning new technology. This was in opposition to the younger managers, who are part of Generation Y suggested a more hybrid approach for the technology training to accommodate the broad work force that are employed by the NJDGE. These managers recommended that training should be made up of round table discussions and hands-on use of the tool as the best learning for the workforce. Employees who are part of the Millennials and not in

the leadership roles, were anxious to dive right in to the technology and exploit its advantages to aide in their productivity.

Management Challenges – New Jersey Division of Gaming Enforcement (NJDGE)

To become more efficient at this analysis the NJDGE needs to research a system that can easily take a text file, convert, format and import the information into a standardized readable format, so that the only manual work is to extract the summary details of Currency in, Player's WIN/Loss, promotional credits, vouchers redeemed, and calculating the amount of the vouchers and comparing it to the information captured by the slot data system. If a system can be found to format the data and place it all in one table, half the time could spent on this analysis and could be completed with a Business Intelligence tool. This also allows for added consistency within the NJDGE that will result in cutting down on the direct labor billed to the casino industry.

The benefits of this technological change would allow investigators to spend less time on unverified vouchers, which are considered routine and yield minimal results such as fines for regulatory violations. This would allow for more time to spend on more meaningful work for investigators such as preliminary investigations that may lead to white collar crime or fraud and can result in fines and the prosecution of criminals. This can add to more positive demeanor amongst employees because they feel that they are making a difference and creating results for the NJDGE and a sense of worth for themselves every day in the workplace.

The overall process of investigating both Internet gambling and physical casinos will be improved by the addition of this new technology. For instance the ability for the technology to record, share and house all of the transaction will allow for better analysis of the profitability of the gambling industry. It would also allow for continuous improvements to the regulation and casinos' internal policies. A new technology that allows for data formatting consistency and

analysis will increase the ability of employees and managers to solve problems effectively. In addition when the new technology is continually being used, it will allow the NJDGE to rely on the integrity of the data contained within the system and the analytical capabilities it provides to make more informed decisions in a shorter amount of time.

When the new technology was identified by the NJDGE, its implementation was inevitable. Government work is a top down management structure, meaning the decisions are made by top level management with minimal input from employees, and delivered downward through mangers to employees. Because of this, a planned introduction to the new technology is not always discussed with mid and lower level employees which may cause the creditability of upper management within the division to be lost. For instance, if a new technology is introduced to the employees of the NJDGE without any formal plan and employees are instructed to train themselves, the results of the new system will be negative and employees will resort back to their old habits. A better approach would be to develop a well thought out implementation strategy that involves employees, training, mangers, and communication. Having upper management show support of the new technology by following this methodology would increase its success rate, productivity and creditability of the implementation.

In the beginning of the implementation, communication with staff about the new system was minimal. The communication that was done was informing employees and managers a new system would be used to acquire certain data from the casino systems, but specifics on the operating or training on the new technology were not shared. Some aspects of the nature of the changes were coming were very clear when the communication was provided. Information such as why it is important to make the change and the effect on employees professionally were not discussed. Open communication within the lower level employees and management was

nonexistent. Another factor that impacted the communication was the location of the IT office, which is in Trenton, NJ. Because the system was being implemented in field offices and not in Trenton, face to face communication was hard to accomplish. In addition to the challenge with location, the IT department was busy with implementing and troubleshooting the issues they were having with the system and did not have time to answer employee inquiries about the technology in a timely manner. Lack of communication by both NJDGE management and the IT department about the new system resulted in the employees' resistance to it when it was implemented. In part this resistance was due to the fact that questions the employees had about the technology never being answered. Some of the key components to aide in the transition and acceptance of new technology such as open communication, the how, what and the why never took place. If these items were communicated to employees via email, newsletter or open forum meetings, the transition from the old technology to new may have been more widely accepted.

When this new technology was implemented at the NJDGE employees were resistant to it as they did not believe that a new system was warranted because they felt old one worked just fine. Staff was reluctant to use the new technology and felt that it slowed them down and would interrupt their normal routines. An additional reason for employee resistance was that a proper training class was not administered. Because of this, it was never communicated how the new technology was going to be useful to staff and how it would help them to perform their jobs. Employees were left on their own to use the system and since they were not adequately trained production slowed. Eventually management recognized that work was not getting completed in a timely manner and a formal training class was provided to employees. Once the formal training was given, system usage increased and employees even began to experiment with some of the application's functionality. The training also allowed them to modify their normal routine to

accommodate the use of the new tool and in their ability to increase their speed in closing out a somewhat routine investigation. Staff communication about the usefulness of the new technology increased. It was observed that some of the younger employees, who quickly grasped the new technology, were sharing information amongst some of the older investigators within the division which caused a better team environment. This resulted in greater acceptance of the new technology because employees were now champions of the new system. Management was on board because they were able to track the time spent on the unverified voucher investigation and compare it to other historical metrics to see the increased efficiency when using the new tool.

Usability of the technology is one of the most important factors when managing a new technology change as was the case at the NJDGE. After all the formal training, questions and testing periods, the technology must be easy to use to gain acceptance. When time is a factor in completing investigation, the new technology must provide the ability to stream line all of the functions needed to accomplish a task. If the system that is chosen can provided all of the data collection, data formatting, and analysis, but is too complicated to use it would increase the time spent on the task and decrease the support of the new technology. This would adversely impact what the NJDGE is attempting to accomplish. Being simple to use while providing the ability to collect, format, and perform meaningful analysis of the data would align with the department's vision of the technology.

Interoperability is defined as a single interface for all the functions of the tool, and must be easy to navigate through all the available functions without entering different platforms. In this instance it is feasible for the NJDGE to house a server to collect the multiple formats used in recording slot data. The overlying application is housed on the NJDGE's server would then

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provide the ability to format the slot data, and format it into a useable document in Excel. Once

the Excel sheet is completed the investigator would pull the summary data and complete the

analysis, utilizing one system for multiple tasks. In the unverified voucher task the investigator

would pull out the patron's win/loss, currency in, vouchers redeemed, and promotional credits,

add and subtract properly, and the analysis is complete, and complete an investigative report.

On the other hand if a system does not have the interoperability then the investigator, and

NJDGE are right back at the beginning using the same lengthy process of collecting the multiple

formats in a text file, importing it into Excel, formatting the spreadsheet, reviewing the slot data,

and extracting the important factor to complete the analysis, then adding subtracting, to achieve

the result.

Management Challenges – ALMAC CT

The adoption of a new tool (HP Quality Center) introduced multiple challenges with

managing the employees' acceptance and trust of the new technology into their daily work.

Management now had to determine the best way to integrate this new technology into the daily

routine of staff. First staff had to be informed that the decision had been made to change the

testing process and that a new tool was now going to be utilized to perform testing. The

communication came at a monthly staff briefing with little time set aside for questions. Not

allowing time for questions or giving staff advanced notice that a change of this magnitude was

occurring was met with disapproval at best. Research has shown that having limited

communication about change and not setting aside time for open discussion helps to create

resistance to the change that is being made. Additionally, as mentioned earlier manual testing

had been the standard at ALMAC and introducing a change to their daily routine was not readily

accepted by staff due to the fear of the unknown and the fear of learning a new tool. To ease

fears, training was implemented in three-hour increments to help promote employees' confidence. At first, there were problems with the availability of the tool, preventing its use and helping reinforce fears. Utilization remained low and employees remained resistant to using the tool and continued to use the old methods they were comfortable with. To rectify the issue management took a step back and evaluated the mistakes made in the roll out of the tool. The first items that was identified was that the communication about the new tool was not handled appropriately. As noted earlier, communication was done at department meeting with no time for questions and little time for staff to absorb the change which put staff on the defensive. Research has shown, when workers do not have time to discuss their concerns and fears about a change they are more resistant to the change being made, and this was the case at ALMAC. To begin to turn the fear into acceptance managers all had smaller meetings with their direct reports to get them talking and find out what the issues really were. It quickly became clear that staff felt that they had no voice in what was being "pushed onto them" and why could they not continue to do things as they always had done them. It was a re-occurring theme of "The way we do testing works fine why do we have to change it?" across all testing groups. Managers spent time explaining to staff why the change was needed and what the business justification was for making the change. This helped staff to understand that the decision that was made was thoroughly researched before a new tool was selected. Great effort was put into listening to all questions and allowing staff to vent how they felt as well as discussing all concerns. Once fears and justifications for the change were discussed the topic of training was addressed. Staff felt that the trainings were inadequate and did not set them up to be successful with the new technology. They were very vocal about struggling to understand how to the used the new tool and the pressure of having to use it to get their work done. Managers agreed that the training

lacked the depth that staff needed and that trying to train on the tool and put it to immediate use was not working and causing delays and added stress to staff member. The decision was then made to pull back on the use of the tool for daily work and to retrain the staff on its functionality. Additional trainings were created to allow employees to ask questions and to communicate their challenges with the technology to the training staff. These trainings were successful and allowed people to share their issues and fears in an open fashion. Once training was completed, a mandatory date was set for employees to use the tool in their daily work environment. Employees began using the tool with better results the second time. Staff was encouraged by managers and trainers to reach out for additional training when they needed it. Utilization went to 100%, however some confusion and questions about how to use the tool effectively are still present.

Presently, the new technology is the standard for performing testing at ALMAC. Although all employees are now using tool there are still some outliers that are very vocal about not wanting to use the new technology and their desire to use the old methods. These individuals are being encouraged to continue to learn the technology and how it is beneficial new skill for them in their careers. A positive in this situation is employees are now assisting in making the tool better for their use and feel more in control of their daily work. Management has continued to support learning and training which has encouraged employees to ask questions and understand the full capabilities of the solution.

Overall the implementation of this tool was not smooth. Gaps were identified in infrastructure after the tool was implemented. Training was found to be too brief and not readily available. Thought was not put into what the training needed to achieve and no goals were set to gauge if the training was successful or not. Research has shown that effective training should

have goals along with a detailed training plan to ensure that the training meets what it was intended to achieve. Management failed to communicate and prepare the staff for what was to come. Open dialog was key to the success of implementing the new tool. If there had been more communication some of the acceptance and resistance issues could have been avoided resulting in a smoother roll out, a better trained staff and the ability to take on additional work that would have added to the bottom line.

Conclusion

Managing employees' acceptance of technology change can be a challenge for any organization. To successfully implement a technology change, several areas need to be affectively addressed. Challenges with internal conflict, or resistance by staff to the change must be managed. Employee training, communication and a multi-generational work force should all be considered and planned for when selecting a new technology. These items can be addressed with a well-defined implementation plan, an effective training plan and open communication between employees and management.

While researching this paper several areas stood out that warrant further exploration. These areas were the appropriate time to deliver new technology training and the monitoring of technology changes once they have been fully implemented. Limited information could be found on industry best practices for the timing of when to deliver technology training. This is an important area that organizations should think about when managing technology change. Studies have shown that the effective delivery of training can impact employee's acceptance and use of a new technology. An additional area to research is monitoring of an organization's performance after the technology is implemented. Research was not readily available that provided definitive information on how and when monitoring should be done to determine success.

In conclusion technology change can be difficult to manage. Organizations can increase their ability to successfully implement these changes if they plan, communicate, manage conflict and monitor all aspects of the change they are making.

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