DOE Lab IT Project

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Introduction

Develop an Enterprise Strategy for IT in Your Organization

As one of 17 laboratories for U.S. Department of Energy (DOE, 2017), NETL is a subsidiary of the DOE structure and as an enterprise environment, it would be made up of the significant offices in Morgantown, WV, Pittsburgh, PA, and Albany, OR. These represent all operating facilities for the roughly 3,000 government employees and contractors.

Significant to their structure, NETL has been operating under a 100% contractor support agreement for well over a dozen years; all government management has been under a structure of an IT Director and several government technical project managers in charge of specific areas. The contractor is responsible for the actual hands-on activities that support the administrative systems. At this time, there is no CIO, so management stops at director level and the Director of the NETL (and various other C level executives) are responsible for decisions at highest level, IT decisions included.

Organization

The organizational entity is a division of the U.S. Department Of Energy, a laboratory that does research work on fossil fuels and minerals in support of the DOE's overall initiative:

> An outgrowth of immense investment in scientific research initiated by the U.S. Government during World War II, the National Laboratories have served as the leading institutions for scientific innovation in the United States for more than seventy years.

> The Energy Department's 17 National Labs tackle the critical scientific challenges of our time -- from combating climate change to discovering the origins of our universe -- and possess unique instruments and facilities, many of which are found nowhere else in the world. They address large scale, complex research and development challenges with a multidisciplinary approach that places an emphasis on translating basic science to innovation. (ENERGY.GOV, 2017, p. 1).

Current IT Structure - Existing Strategy

As a division of DOE, surprisingly, the laboratory has its own complete IT infrastructure, with data centers in three cities, its own internal admin network, servers for storage and applications, help desk, repair services and so on.

None of the support functions are performed by government employees; all is contracted out to support contractors. Daily operations are handled by these support contractors, along with any new "projects' that are initiated by one of the government technical operations managers. These tech ops consist of about eight government individuals, all who are to oversee all IT operations and projects.

While most everything that is performed in IT is a duplicate of DOE headquarters, much of it is just a matter of wanting to maintain control. The lab acts as its own individual IT entity, and tries to sidestep DOE Headquarters any chance it gets.

Contractors performing project work need to be cognizant of the business specifics of a project. There exists a concept of a hybrid project manager with one foot grounded in the project, the other business domain. There is a paradox because IT knowledge has considered itself separate from business knowledge. There is considerable pressure on project managers to resolve this issue (Ko & Kirsch, 2017)

The government tech ops managers are not specifically trained in their areas and frequently do not understand much of the technical requirements of what they oversee, for the most part. One individual is highly trained in his area, and not surprisingly, his area tends to have the fewest problems.
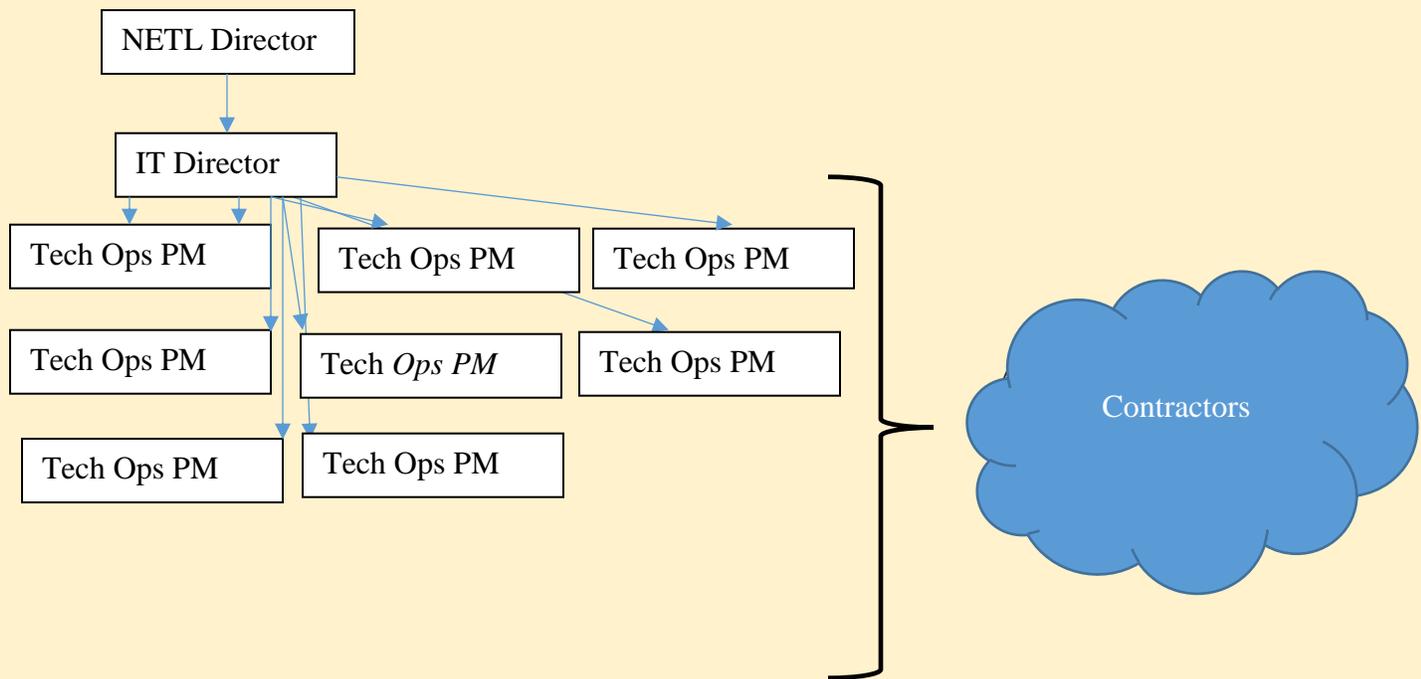
The project manager's personal attributes impact the overall success of a project. Their

relationship with stakeholders is vital. (Mazur & Pisarski, et. al, 2014). There has been little

cooperation from the government in working with the contactor project managers. They have

frequently sidestepped project documentation, schedules, and tasks. Very emotionally immature.

> Emotional intelligence and cognitive flexibility were found to be related to
> the development, quality and effectiveness of major project managers'
> relationships with both internal and external stakeholders; and these in
> turn were associated with their ratings of project success (2014, p. 944)

External Environment

Externally, as a government entity, much of what they have to deal with is not being able

to just purchase everything they need in one major purchase, but instead, each year as money is

available, they must add bits and pieces of what is available. A "key error was that it failed to

take into consideration an emerging technology" (Dess, et. al, 2013, p. 34).

What is lacking, is a substantive plan. Items are just purchased willy-nilly on a technical

operations manager's whim when money suddenly becomes available. No long range planning

comes into play, so a mishmash of technology is cobbled together as it becomes available.

Environmental Scanning

As Dess, et. al notes, external environmental scanning could help to "predict

environmental changes and detect changes already under way" (2013, p. 36). The problem is not

taking a realistic management view means threats are often not even seen or strategies that are

ineffective are created. (Dess, et. al, 2013).

Internal Analysis Competencies

The operation could be considered successful (profitable) if creating support for their user

base could be determined as exceeding the overall contract cost. Creating value for those

customers is the goal (Dess, et. al, 2013). Externally, use of SWOT analysis has already been

shown to be beneficial (Dess, et. al, 2013). However, a good hard look internally at the entire

organization could also shine light on opportunities for improvement (2013).

Adding highly skilled individuals to the contract only would raise costs, but not

necessarily improve environment for the end users. With CIO level management, choosing the

correct individuals for the matching support needs could be implemented (2013)

Use of automated tools to help support end users could go a long way in reducing costs

and still improve services (2013). In this way, both the end users and the contract costs benefit

through better, automated support, and lower contract costs. But to achieve this, the CIO level

planning has to be implemented throughout (2013).

Organizations, like Microsoft even, had to provide feedback to get their purchased services up to the level they expected (Dess, et. al, 2013, p. 78). Allied Signal and Honeywell also had to work together to bring the kinds of improvements they were looking for (2013). CarMax had "real-time business insights into different store operations, such as inventory management, pricing, and sales consultant productivity" again, utilizing technology to help their business (Dess, et. al, 2013, p. 80). Even though the lab is a government based entity, the same kinds of automation could greatly improve the overall support.

Developing lessons learned could dramatically improve the project environment. At this time, very little data is captured from any previous projects. Utilizing lessons-learned is an important aspect of project learning. It is an attempt to provide new models for project performance (McClory & Read, et, al, 2017).

PESTEL Model

(Professional Academy, 2016)

The definition of PESTEL, as listed above, will be applied to this most recent work environment – which was, by many accounts, toxic at best, outright terrible as viewed by most.

Political – For the most part all (of about 8) of the government people did not like each other or get along. They worked (with limited political stability) to try and backstab and make each other look bad. As such, they frequently would pull in members of the contracting staff (mostly managers) and set them up to cause issues for one another.

There was little opportunity for success in the organization since the government individuals were always working hard to create an environment of failure. They would frequently schedule meetings then cancel at last minute, not stay on agenda and bring up totally unrelated issues, talk on personal gripes that frequently had little to do with project or maintenance work, disrupt in any way they could.

There was no stability on the government side and the team members would just work to frequently sabotage other's initiatives (hoping to make themselves look good). All government tech ops managers (save one, who was very educated and good at what he did) were not trained and actually from other fields than their specialty. Politically, was pretty much their activities from day to day. IT director was not real effective and though he worked to try and bring things together, the environment (plus his pending retirement) was against him. Now there is a new IT Director, former software technical operations manager.

Economic Factors - There was little economic planning and frequently huge delays in just basic supplies. The need for 100 backup tapes (around $2,500) was delayed for well over 6 months plus, impacting the organization's capability to even have reliable data backups. While

there was talk of money frequently, lots of times there were just delays until something became very critical.

Social Factors - As stated, the government people had little understanding on how to get along themselves and each basically tried to play certain contractors to support their efforts – always seeking conflict. Little was frequently accomplished – there were plenty of opportunities for disruption and they occurred quite frequently.

Technological Factors – Poor choices of equipment and systems from years earlier impacted the latest systems implemented. There was little integration; not much of a consistent environment; again, poor planning and execution of systems that had several compatibility issues due to inconsistencies. Occasionally, one government person would have some money to spend and would just go out and purchase something they wanted – no concern for consistency or compatibility. Unfortunately, warranties on new equipment were often expired prior to its installation, so there also was a cost factor to setting systems up.

Environmental Factors – Just like the inconsistencies of local systems, this organization had 3 different sites, all of which were managed in different means and nothing (other than some file shares) were consistent across all environments. Each was its own little sub-empire. Many times, differences in systems and setups caused issues for different campuses.

Legal Factors – Just as willy-nilly as the entire environment was built, occasional Federal mandates would come down from senior organization and people would run around frantically trying to make one factor compliant. Usually, it was to do with the elimination of one particular environment, but it actually could be any Federal mandate that happened to appear at the time. Caused major upsets to business as usual environments and frequently lead to failures.

While we had several capable and highly skilled individuals on this government contract, most

have moved on leaving both incompetent and backstabbing contractors and government folk to

continue.

Five Force Model
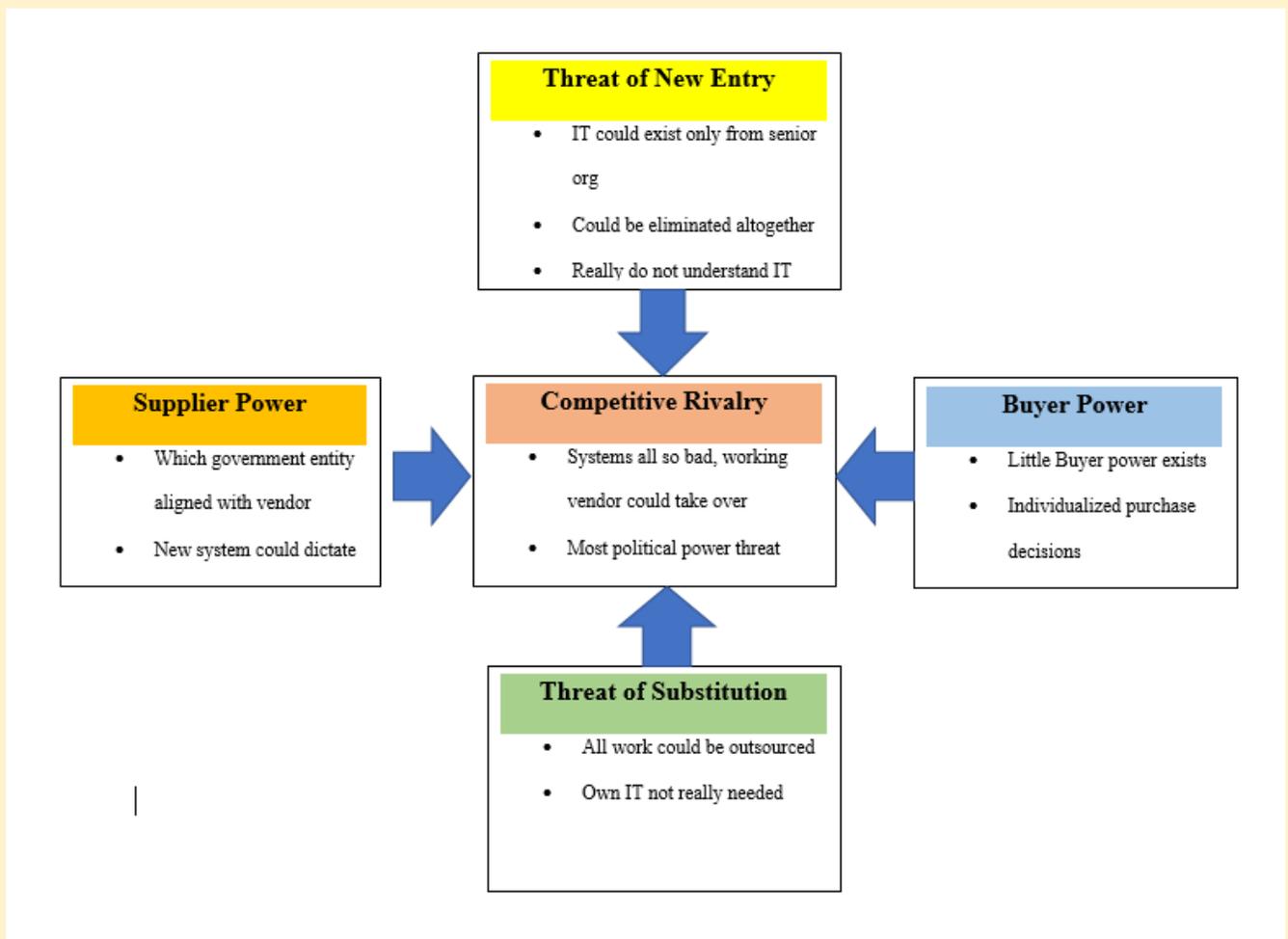
Five force model could reveal core issues on the laboratory systems setup. While

day to day operations could usually move along, any change or hiccup in systems would cause

serious consequences.

Internal Core Competences

The lab has a long history of several systems administrators, client systems engineers, desktop engineers, network engineers, and various other long-term contractor employees. They have survived multiple contracts as they renew roughly every 3-5 years, different management consulting firm holding the contract each time. However, the core staff remains. One individual has been on contract over 30 years. Several have been on contract for over a decade. The management team has changed; but the same workers remain.

This has provided some extremely knowledgeable contractor employees. Yet, it has also created an environment that has seen little change and has not necessarily embraced the latest technology. Also, as mentioned, the lab has no need to run its own administrative IT shop. All services could be provided by the parent organization, DOE, so really the work is a duplication of effort. Yes, the lab would lose some control, but the reality is, the IT Infrastructure is mostly duplication of effort and represents millions of dollars in cost just to stay separate. Very poor use of taxpayer funding. Operationally, there is only email (now O365) and Microsoft Office applications. There also are a few homegrown system, but for the most part, there are very simple office applications and O365 – hardly an environment that needs its own serveres and infrastructure.

VRIO Resources

VRIO stands for the concepts of 1) Value 2) Rarity 3) Imitability 4) Organization (Knott, 2015). A method of evaluating a firm that has become quite popular, the application of VRIO can reveal some interesting attributes (2015). At the lab, much of what is accomplished, day to day, is a result of just keeping things going. However, the value of the work (energy research) carries with it a huge amount of ramifications. "NETL has expertise in coal, natural gas, and oil

technologies; contract and project management; analysis of energy systems; and international energy issues " (NETL.GOV, 2017). As such, the lab controls a lot of the research on vital energy products for the nation. The "Value" portion of the equation is quite significant. The VRIO method should help managers understand how this is important (Knott, 2015). It is important to select the valuable assets of the organization, and at the lab, there are many factors that are rare to the lab and not imitable, both factors which provide a uniqueness to the organization (2015). However, the administrative IT components of the organization are floundering in many ways, which in the end, cause numerous inefficiencies that impact all.

Value Chain Activities

Firms need to pay attention to all cost activities, not just a select few ((Dess, et. al, 2013). The lab had what was known as the "shiny object" syndrome. For whatever reason, certain IT components would become someone's shiny object and receive all the attention (good or bad) of the different technical operations managers. Associated costs to the object would either be cut or added to – didn't really matter, it was all a ruse of activity, a CYA for the individual. The costs were either recently found monies or reduction of specific services or components. Either way, they were rarely looked upon in a logical or *business fashion* but instead, were usually just an emotional reaction to a set of circumstances or comments from the director or other executives.

The important lesson, little was done based on analysis, more was done because of circumstances (Des, et. al 2013). In the end, there frequently was either action taken that caused other issues and money spent for naught. (2013). The understanding of true value chain activities simply was not present.

SWOT Analysis

A management level SWOT analysis could go a long way in helping to bring understanding to the situation. Some of the things immediately that the SWOT could impact are:

- build on its strengths,

- remedy the weaknesses or work around them,

- take advantage of the opportunities presented by the environment, and,

- protect the firm from the threats. (Dess, et. al, 2013, p. 42)

Further, this external scanning could better identify new technology and products that could be delivered to the end user (Dess, et. al, 2013). Clearer understanding from a CIO level could bring much improvement to a toxic environment – a place where each technical operations manager tries to fund and manage their own little empire, and basically justify keeping their jobs.

The idea behind a SWOT analysis is to build on the strengths and opportunities and mitigate the weaknesses and threats (Dess, et. al, 2013). Through this analysis exercise, much can be gained and understood.

Strengths	Weaknesses
- Many long-term contractors - Good job knowledge - Used to working together - Good separation of support efforts	- Lack of reliable funding stream - Downsizing of many activities - Bad government attitudes about work - Long term – government employees
Opportunities	**Threats**
- New technology becoming available - Some new funding streams - New knowledge sharing applications	- Plenty of backstabbing for all - No real need for independent IT shop - Lack of funds - Fossil fuels no longer in favor, especially coal

The lab needs decisions on whether to adopt a specific project plans is very important. Checklists are a common tool; as are CMMI processes, 6rh Sigma analysis, ISO and others. The important thing is that plan evaluation is taking place (Féris & Zwikael, et. al, 2017). There exists little planning activity for all. It is not that specific courses of action can be put in place, it is more a nonchalant attitude about critical IT structures exists.

Gaining consensus on success is difficult in the environment. Project management is an immature research field. Evidence of project failures in the industry suggest a more rigorous investigation is needed. Some literature suggest that stakeholders may have different perceptions of what constitutes project success (Davis, 2017). This is a major issue for the lab.

Success criteria should be determined *before* the start of the work (Davis, 2014). This frequently is not the case. There is much resistance on the part of the government client to commit upfront on what constitutes success. They would rather be free to judge after the fact, usually finding some miniscule exception to complain about.

"Successful managers must recognize opportunities and threats in their firm's external environment" (Dess, et. al, 2013, p. 35). Lack of CIO level management or realistic funding for what they are attempting to create means they are destined to simply keep limping along and cobble together what they may as money becomes available.

Strategies

Business

The U.S. Department of Energy boasts that it has 17 different laboratories. Of these, how many are running duplicate operations? Just a couple years ago, this lab had its own Novell GroupWise servers that handled all its email. About two years ago, that was obsoleted and email

was transferred entirely to the Cloud on Microsoft's O365. The servers no longer need
maintenance and support – it is all Microsoft's problem now.

"The first, overall cost leadership, is based on creating a low-cost-position" (Dess, et. al,
2013, p. 142). At a CIO strategy based on costs and effectiveness, many of the existing services
could be improved. The laboratory is not that many people – maybe a few thousand nationally.
What the justifies the exorbitant cost of duplication of IT services? The DOE has the capacity to
integrate all admin IT services of the lab into its already existing infrastructure. There truly is no
need for a duplication of effort other than certain government egos and the desire to keep
separate and control, neither of which are good reasons to spend taxpayer dollars.

Corporate

The lines between government agencies and other organizational entities have blurred.
While government is still frequently a *funded* organization, they now take frequently take on a
more business stance when competing. (Bromley & Meyer, 2017). Other similar organizations
and universities more frequently find themselves in competition for certain funds. In these
instances, each organization has to produce a more *profit motivated* stance to show their funding
worthiness.

The issues of a government entity is that is based on funding provided and not necessarily
ever perceived as a for profit organization. As such, its work is usually set to spend what they
got as opposed to what can we least spend to make a profit. Somewhat backwards thinking as
opposed to a for profit entity.

The trick is to take that "spend what you got" attitude and change the understanding to
"what can we save to have more and better?" As Dess, et.al, would describe, more of a low cost

and differentiation focus (2013). This would be ideal, but definitely is not where the organization

is today.

Instead, the organization is focused on "overall low cost" – not what would be truly

needed, but what can we get by with considering the current funding reductions. Each year, over

the last several years, funding has been reduced, therefore, *profits* have been down and the

organization has reacted accordingly.

As common with many government entities, none of the support functions are performed

by government employees; all is contracted out to support contractors. Daily operations are

handled by these support contractors, along with any new "projects' that are initiated by one of

the government technical operations managers. These tech ops consist of about eight

government individuals, all who are to oversee all IT operations and projects.

Innovation

Unfortunately, much of the project work is in conflict with tech ops managers,

government, who acting as Executive Sponsors, frequently disagree with use of technical

individuals to support the project. Identified perception differences between project managers

and executive sponsors and their involvement and contributions to projects (Kloppenborg &

Stubblebine, et. al, 2007) These differences in perspective frequently caused issues amongst

government and project managers.

Global

While some research from the lab has expanded beyond the USA, for the most part, the

lab only concerns itself with domestic research issues. Therefore, global considerations are

mostly non-existent.

.Basic IT Strategy

"As cumulative experience doubles, costs and labor hours needed to produce a unit of product decline by 10 to 30 percent… workers getting better at what they do… production processes being automated and streamlined"(Dess, et. al, 2013, p. 143). Truly, with existing staff these economies of scale could reduce overall cost. Whether you have 5,000 uses or 10,000 users, for the most part, the system can be supported by the same people. Duplication of efforts anywhere within the DOE is simply a waste of taxpayer dollars. By effectively combining those efforts throughout, everyone wins.

Much of this could be achieved through a thorough and detailed SWOT analysis, focused on the IT functionality of the organization

> As part of this planning procedure; a strength, weakness, opportunity and threat (SWOT) analysis is normally compiled for the perusal of senior management and as an aid for strategic decision making and benchmarking current capabilities against industry accepted levels of performance and operating methods/practices. (Davies & Thomas, 2014, p. 620)

As Davies describes "The technique of numerical situation analysis" can then be performed to add greater understanding to the overall environment (2014).

Clear understanding of a project, as defined by PMI could help the work at the lab. The temporary nature is often ignored, and even though they are called projects, they are treated like continued operational events.

> A project is a temporary endeavor undertaken to create a unique product, service, or result. The temporary nature of projects indicates that a project has a definite beginning and end. The end is reached when the project's objectives have been achieved or when the project is terminated because its objectives will not or cannot be met, or when the need for the project no longer exists. A project may also be terminated if the client (customer, sponsor, or champion) wishes to terminate the project. Temporary does not necessarily mean the duration of the project is short. (PMI, 2012, Kindle Locations 601-605).

Enterprise Strategy

Focus on control practices used for sustainable project management provide a basis for an enterprise strategy. As qualitative, single case study on an infrastructure project – a road tunnel constructed in a highly demanding environment. There were multiple stakeholders in an alliance contract (Kivilä & Martinsuo, et.al, 2017). This type of contract leveraged the best from industry, social organizations and government. A similar approach could build successful collaboration at the lab.

For several years, the laboratory operated without a director – only interim individuals who participated in keeping the lights on, not aggressively attempting to improve organizational processes or procedures (or lower costs). In 2015, an actual director was appointed to manage and improve the laboratory overall. She, and her team consist of:

- o **Grace M. Bochenek**, Ph.D.—Director
- o **Randall W. Gentry**, Ph.D.—Deputy Director, Science and Technology Strategic Plans and Programs, Research Innovation Center
- o **Linda S. Kimberling**, Ph.D.—Deputy Director & Chief Operating Officer
- o **David E. Alman**, Ph.D.—Acting Executive Director of the Research and Innovation Center (R&IC)
- o **Sean I. Plasynski**, Ph.D.—Executive Director, Technology Development & Integration Center
- o **James E. Wilson**—Executive Director & Chief Financial Officer, Finance & Acquisition Center (DOE.GOV, 2017).

Auspiciously missing from the above C Level Executives is a CIO – a problem that has yet to be solved. In 2015/2016 there was talk of filling that position, but from this list, it looks as if that has yet to happen. Therefore, all IT functions within the laboratory are still managed by a director and her staff of technical operations managers, sadly an inadequate setup with only contractors doing all the heavy lifting, and a total lack of C Level management direction of IT operations or projects.

Strategy Alignment

There is very little strategy represented in the admin IT area. The norm is to keep things *status quo* as best as possible. Each month, there are two preventive maintenance periods on weekends (applied to production system since there is no test or development systems) which with luck, nothing breaks (or no roll-back is needed). However, there have been multiple times from PM that things have been messed up and Monday morning access was limited or non-existence.

The strategy seems to be one of hit or miss- consistent application of patches and upgrades may or may not work. Talk of setting up test environments or better PM procedures are pretty much ignored, and when there is a crisis, the usual resolution is to work through it until resolved then find some individuals to blame. Really a very ineffective strategy.

Projects should continue with same enthusiasm as at the start. Downward spirals of stakeholder disillusionment could be avoided (Brown & Hyer, et. al, 2017). Improvements in project starts could be clearly made and elimination of just slipping into a project (2017).

Risk Management Plan

Governance monitors and regulates risk management on a weekly basis. Risks are captured in the same 20 year old NASA database, PITS, and reported out in spreadsheets from governance manager. They are rarely acted upon; mostly just noted, True mitigation planning is non-existent.

Change Management

Likewise, change management is also captured weekly in PITS and reported out by governance manager. While both risks and changes are reported, frequently they are just left to

the following week. Active mitigation or change management is quite rare; it seems customer is

just satisfied with knowledge and not looking for any real correction.

Role of CIO

If a CIO was put in place, the entire IT infrastructure could be approached as a whole

unit. There could be a better overall design; DOE duplicated services could be eliminated and

focus could be placed on real local IT problems. "IT leadership in government is going through

a transformation from an operational to a strategic focus, expanding their goals to include not

only efficiencies and cost savings" (De Tuya & Cook, et. al, 2017, p. 1) The technical operations

managers (government) could be held accountable for their efforts and spending could be

curbed; purchases could be directed from the highest level. Techniques of software process

improvement could be implemented (Akbar & Hassan, et. al, 2016).

As CIO, a complete turn-around of IT activities could take place. Prudent decisions

about systems instead of emotional whims could become the standard. Purchase of equipment

based on long term goals rather than short term desires could be put in place. IT functions could

be discussed at the laboratory director level on a regular basis having someone with overall

knowledge addressing the issues.

Conclusion

Simply because one is government is *not* an excuse to ignore profit based

efficiencies. Standing up new systems and services in remote offices, simply because you can

get the funding, is not an operational advantage or savings. Government (in USA) has relied on

for years local GroupWise servers and accounts, simply because they had no choice.

Technology today has provided Cloud based solutions (like Microsoft O365) which eliminates

large amounts of hardware and local support. With that type of future vision, a CIO for these

organizations with help of evaluative tools such as SWOT and NSA could effectively look to a

more profitable (actually less costly) means of supporting government initiatives and end users.

Additionally, the use of governance as a concept to manage many of the project activities helps

to create an environment of success (Joslin & Müller, 2015). Governance role is key and should

consistently support project goals enforcement.

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