Introduction

The student who receives his diploma and congratulations upon graduation may then turn his thoughts to a possible career or job opportunity. To do so after graduation is a natural, though probably very late activity. The purpose of this document is to provide an aid for students to consider various careers available in business technology. Not only will this help in the selection of a major and related coursework, but also assist the student in preparation for job search and long-term career planning.

For those already in the workforce, this overview of the IT industry will be helpful for those contemplating a career change, or simply trying to read the tea leaves. Technology changes rapidly, but familiarity with long-term trends may provide some guidance for personal planning.

The Current State of Technology Organizations

Y2K issues and the Dot Com bust are history. We have recovered from the great crash of 2008-2009. IT spending has been flat for years but is now beginning to recover. However, new projects increasingly require strict business justification. Post-mortem reviews are then used to confirm and document the value of technology investments.

The concept of IT Alignment has been popular, but a lot of people still don't understand it. As IT practitioners learn more about alignment, it is maturing into a value creation tool for business. Since this is the case, the IT professional who makes the effort to learn and understand the business of the employer may have much better career growth. The most successful IT leaders have strong knowledge of their particular industry, but also have the skills to land a job in a different industry and repeat the process.

One of the largest recent trends in the IT industry is the sourcing of functions and jobs outside of the business. In some cases, these jobs are moving offshore, where lower cost resources are available. Outsourcing masks another, larger trend that has always impacted IT, simple automation. More IT jobs have evaporated due to automation than from outsourcing. On the other hand, there are more new opportunities for IT professionals than there are disappearing. The challenge facing the current student is to develop a career skill set that remains valuable to employers.

In summary, IT is now a global industry. The jobs and the skills span countries and continents. Jobs are moving from corporate IT departments to vendors. The IT survivor should be characterized as a *versatilist* – an individual who is competent in several disciplines and familiar with many. In fact, we believe that

the successful corporate IT groups are in transition from a technology organization to a business organization. That being the case, the best long-term job opportunities in IT are those with a heavy business focus.

Careers in Technology

Administrative

As the technology sector becomes increasingly responsible and responsive to business, we find that the CIO/Director's personal staff is changing to accommodate these needs. Typically we see the creation of administrative positions that provide and manage the level of accountability demanded by the organization.

Budget / Financial Administrator

The Financial Administrator manages the creation and implementation of the IT budget under the general oversight of the CIO/Director. This includes studying and understanding the budget targets selected by senior corporate management, guiding the IT managers in planning the fiscal management of their respective areas in the next fiscal year, and preparing the summaries that the CIO/Director presents to senior management. On a continual basis, the Budget Administrator tracks the performance of the organization against the budget and advises management on actions that will affect the budget.

Asset Management

In businesses with large desktop fleets, Asset Lifecycle Management has become a critical element in the efficient IT organization. Those with a fundamental understanding of accounting principles along with an interest and expertise in technology will have very positive career opportunities.

Value creation is hard to identify in this area, however regulatory issues, as well as simple management of equipment, make this a necessary function.

- IT Asset Lifecycle Management
- Fixed Asset Management/Accounting
- Enterprise Asset Management (EAM)
- Electronic equipment waste disposal (eWaste)

License Administration

In an era that is sensitive to Intellectual Property, and where businesses are subject to draconian penalties for license infringement, many large IT

organizations dedicate a position to a License Administrator. While this role is technically a subset of Asset Management, it has assumed major importance. This administrator is responsible to document software license usage and ensure compliance with license agreements, along with related laws or regulations. With tight budgets being a fact of life, the administrator is also required to manage the utilization of software licenses in the most cost-effective manner.

Project Management Office (PMO)

The Project Management Office (or Program Management Office) is a relatively new invention in American business. The manager of the group typically reports to the CIO/Director. This function recognizes the importance of best practices in technology projects. The *Program Manager* will provide overall coordination of all IT projects and sometimes have corporate-wide authority. This senior project manager ensures that projects are following established corporate practices and are on track.

Project managers are the first line of risk mitigation for corporate projects. A well run IT Program Management Office will find itself being asked to assist with non-IT projects across the organization.

Administrative Assistant

As the importance of Information Technologies, as well as the CIO/Director, has grown in the modern corporation, so also has the clout of the administrative assistant. While originally little more than a secretarial position, this function is growing more akin to that of a military Chief of Staff. The purpose of this individual is to expand the breadth of the CIO/Director's responsibility and workload beyond what a single individual could normally manage. While the Admin's authority is typically limited, his influence may be great indeed.

Regulatory Administration

Corporations have, over the past 40 years, faced increasing requirements from governmental and other regulatory organizations. Businesses struggle to control the costs of these imperatives and are turning to technology to automate them. In each major area of regulatory or legal activities, there exist opportunities for aggressive IT professionals to build important careers. The thorough understanding of business and technology gained by the Business Technology degree will provide a wedge into one of these opportunities.

- E-Waste and Recycling

  In an era that places heavy emphasis on green technology and conservation, IT is under heavy pressure to be a good corporate citizen. The federal government, as well as individual states, are increasingly regulating waste disposal, particularly the computer equipment – which often contains carcinogens and heavy metals.

  Managing the collection and disposal of electronic waste is now a full-time job in many businesses. This task not only includes clear goal or recordkeeping skills, but also a familiarity with technology.

- Sarbanes-Oxley compliance

  Spectacular failures of corporate governance have brought the heavy hand of regulation into the management of business through the Sarbanes-Oxley Act. There are now legal requirements of public corporations that enforce a level of accountability to the public and the stockholders. Because senior management is literally betting a jail term on the correctness of the reports, there exist grave responsibilities in the management of the same.

- GLBA compliance

  The Graham-Leach-Bliley Act was a reform of the nation's banking laws. A portion of the act included the *Federal Privacy Rule* which governs the disclosure of customers' personal financial information used by financial institutions. This has become an area that requires corporate and IT remediation as well as on-going compliance audits.

- Payment Card Industry(PCI) Compliance

  Because of widespread problems with credit card fraud, victimizing both consumers and businesses, the payment card industry has imposed regulations designed to reduce risk by standardizing merchant requirements for credit card handling. This requires widespread security and privacy remediation as well as ongoing audit responsibilities.

- HIPPA compliance

  New legal requirements regarding the privacy of medical data have created a new industry that manages medical records and authenticates the rights of medical personnel to have access to

them. Assuming the viability of PPACA, there are extensive opportunities in medical technology.

- Financial Industry Reform Act

  The passage of financial reform in the U.S. Congress has many businesses wondering how they will be regulated. The heavy IT presence in business means IT will almost certainly be involved in these efforts.

- EU General Data Protection Regulation (GDPR)

  The European Union is moving to protect the privacy and security of data belonging to, and referencing its citizens. It is doing so in a far more aggressive manner than the United States at this time. Some level of compliance with this regulation will be required for firms that conduct business in the EU, so we can expect that American businesses will make the necessary changes to their practices and procedures if they wish to maintain a global presence.

  In addition to GDPR requirements, individual states are rapidly evolving similar regulation. In the long term, we expect either the Federal Government or some industry consortium to and harmonize privacy requirements for business.

IT Service Management (ITSM)

One of the top priorities of the technology organization is the support of the end users. To be honest, the needs of the user justify a large portion of an IT organization's existence. While improvements in the reliability of hardware and operating systems may cause shrinkage in the share of the IT budget by support organizations, the increasing complexity of desktop applications will guarantee career opportunities for years to come.

Call Center

The first line of defense for the Help Desk is the Call Center. It is also the face of IT presented to the user. Call Center Management has evolved into a solid science and will remain a source of great opportunities due to its heavy emphasis on human interaction. Call Center work requires quick thinking and steady nerves.

As part of a corporate sourcing strategy, the Call Center may be managed and staffed by an outside firm. There are great professional opportunities in working for companies that specialize in this activity.

Service Desk

Opportunities at the Service Desk include not just technical and application support, but also the management of support queues, management of new system rollouts and upgrades. The Service is often involved in setting desktop strategies, which have a heavy impact on the business.

With the trend towards *Consumer IT*, and users migrating towards personally owned devices, there may be a net reduction in jobs in this part of the industry over time.

Software Development

Software Development, while a viable IT career choice, is migrating from frontline corporate businesses to vendors and contractors. Successful software development will, therefore, require a true customer focus for success.

Software Development

As the software development process becomes more quantified and brought under best practices disciplines, the science of Project Management is gaining traction. Actively managing software development projects *as a project* has become a critical risk mitigation procedure that leaves opportunities in the hands of professional project managers. This becomes a *knowledge worker* type of position that is resistant to outsourcing.

The able developer must not only master the technical skills required for effective software development, but also a thorough understanding of the immediate business needs driving the project. And understanding of corporate business strategy is advantageous, as well.

Software development tools may be trending towards packages that generate applications based upon quantified business rules. These may require a different mindset than has been typical for developers.

Technical Writer

A consistent need for years has been for competent technical writers in Information Technologies. While this is not necessarily a management role, there are tremendous opportunities for those that are competent word-smiths who enjoy writing about technology. This may lead to management opportunities in publishing, as well as entrepreneurial writing.

Data Management

With the trend towards Knowledge Management, this whole group of functions has shifted from the software development arena into a much more business-oriented grouping. These revolve around a central focus based on Business Rules or Business Process. This is a key element of IT Alignment. Entire business conferences are now dedicated to Data Management. This requires the development of analytical skills.

Database Analyst

Database analysts have always been able to demand premium salaries. To climb to the top of this field requires a thorough knowledge of business in general as well as specifics about the employer's business. While DBAs are moving to the vendor side, the corporate database analyst who has a fundamental understanding of the corporate business will have a secure position.

Business Analyst

While a business analyst is not necessarily technology oriented, techno-savvy analysts are a much better fit for the modern corporation and often rise above their peers.

Data Mining and Data Warehousing Analyst

Building a Data Warehouse is a skill set that is not necessarily the same as utilized by a Database Analyst. As IT moves into closer alignment with the business, the ability to look at corporate data in new and unusual ways becomes more critical. It often is something that provides competitive advantage.

Business Intelligence

BI is not strictly an IT career, but rather straddles IT and the business world. It provides a set of applications that gather, store, access and analyze business data as an aid to decision making. This area, in particular, is where corporations can take great advantage of computing horsepower.

Business Process Analyst

Technology literature does not describe the Business Process Analyst as a formal job title. However, the process specialist may operate as a project manager, database analyst or as a general software consultant. The skills incorporated in this type of position represent the pinnacle of analysis. With leadership and general management skills added in, this individual has the ability to climb to the top of the modern corporation.

Master Data Management

The integration of disparate data sources is necessary to avoid *siloing* but raises other problems related to the validity or authenticity of individual data items. This then requires the establishment of definitions for master and subsidiary data. In most organization, this leads to complex problems. The new discipline, Master Data Management is rapidly evolving to deal with this challenge.

Training

One of the keys to managing IT costs and enhancing effectiveness is thorough, aggressive training of end users. This is often not recognized by corporate and IT management but is none the less true. Training roles for IT professionals are most often available at the vendor level, but also within larger businesses.

Training is a key part of employee development for IT as well. Management of the process is becoming more important. While we are not explicitly addressing employee development in this document, those readers headed to management positions need to pay attention to this area. Employee development has a direct impact on employee retention.

The Training Specialist

Direct training of end users is a viable and rewarding career. While employees are increasingly entering the workforce with computer skills, there remain many opportunities for training on custom applications and advanced work on office productivity applications. Not to mention that many end users are simply not as knowledgeable as they think.

IT Operations

The smooth operation of a data center of technology infrastructure is crucial to the health of the modern business and reflects on the competence of the business. It also reflects on the CIO/Director. Also, the center of gravity in IT seems to be moving from the Service Desk to Operations. The current popularity of the *DevOps* philosophy influences this, as well.

Operations staff is growing. While these tend to be highly technical jobs, they also are more secure. As more and more data center functions are moving to the cloud, these function still require management. It is true that the more specialized people will move into the vendor space. However, the cloud phenomenon has not finished its run, so it's hard to predict where things will settle.

Professional

In this section, we examine a group of roles that do not necessarily fit into the other broad groupings. In many cases, the precise definitions of these positions are still evolving.

Chief Information Officer

The CIO is usually the top technology official in the corporation. This job carries responsibility for crafting and guiding an information strategy as well as the overall management of the technology organization. Ideally, the CIO reports to the CEO and is considered a part of the senior management team. It is also common for the CIO to report to the CFO or perhaps the COO. This is more an aspect of the corporate culture and mission than anything else. Often, the reporting relationship will illuminate the corporate strategy and attitudes towards IT.

Chief Technology Officer

The CTO title is sometimes interchangeable with CIO. CTO's are more common in high tech businesses. In some cases, a corporation may have both a CIO and CTO. In this instance, the CTO focuses on technical issues while the CIO looks at the information. Either may report to the other, or in rare instances they are peers.

Chief Information Security Officer

As we have become ensconced in an Internet economy, the rise of viruses, Trojans, hackers and other malevolent hacks have required a level of vigilance beyond the capabilities of many systems and network administrators. The CISO is often a "card-carrying" CISSP (Computer and Information Systems Security Professional). In some cases, the CISO is responsible for all corporate security, not just within the technology sector. While the necessity for doing business over the Web demands that we bring the problems under control, it is reasonable to assume that the CISO is a long-term proposition for corporate America.

While the CISO often reports to the CIO, he more properly is responsible to the COO.

Chief Digital Officer

The role of the CDO is to oversee the *digitalization* of the business. More than just automating manual processes by digitizing them, digitalization changes or transforms business process enabling enterprises to survive and prosper in this new age.

This role is widely considered transitional and may reflect a CIO that is not strategic. Once the digitalization process is underway, the role may well be subsumed into the office of the CIO. Or the CDO may *replace* the CIO.

Chief Privacy Officer

The EU GDPR (General Directive on Data Privacy) specifies the role of a Chief Privacy Officer, whose job is to ensure corporate compliance with the regulation. Considering the bewildering thicket of regulations being considered by the various states, not to mention the insecure and inconsistent corporate data sets referencing customers, this position will probably become very common and very important. And, this could be a marvelous opportunity for the IT professional.

Knowledge Management

KM seeks to quantify and administer the body of corporate strategic information. This is a relatively new science and offers opportunities for careers both at the corporate and vendor levels. This is a growth area in the technology arena and of strategic importance to most businesses. The level of abstraction demands people who understand theory and are able to implement. While some businesses have designated a Chief Knowledge Officer (CKO), the field is still young and fluid enough that specific roles may be self-defined.

Enterprise Content Management

ECM is a melding of Knowledge Management and Document Management. It assumes that corporate knowledge is an asset to be nurtured, protected, and used to create value for the business. This field is still developing, but cross-disciplinary opportunities abound.

Document Management

Various levels of document management may well be a subset of KM or ECM. However, due to the high levels of spending for document life cycles (from creation to printing to storage), there are some amazing opportunities in this niche. Most of these reside at the vendor level, and it is currently a very uncluttered field.

IT Auditor

An understanding of finance, as well as technology, is merely the basis for IT audit. The auditor must understand the strategic implications of information to the business and how it may be utilized. A part of good governance requires financial accountability on the part of IT, and hence the career opportunities implicit.

IT Governance

Many of the roles described in this paper are the result of serious attention paid to IT Governance. The CIO/Director *must* be very familiar with principles of good governance. The role of a specialist in this area typically would be at the vendor level. Typically the consultant for IT Governance would be a former CIO and also heavily experienced. This is a pragmatic field and not kind to theorists.

Disaster Recovery / Business Continuity Planning Specialist

Events of the past several years have confirmed the longstanding attention paid to Disaster Recovery by Operations Managers and CIO/Directors. Successful disaster recovery is certainly due to prior planning and testing. In large organizations, this may be a dedicated position. More often, this kind of a specialist is at the vendor level. This role is often held by the CSO or may report to the CSO.

Pursuing a Career in Technology

Achieving the transition from academic life to a career track is often difficult. Proven ability and experience is a prime requirement for a work position; something not often acquired in college. Sometimes a more oblique approach is helpful. We suggest treating this as a problem-solving exercise.

Develop a set of rules or practices necessary to accomplish the job goal.

- Be conversant with current thought on resume creation. Look for resources to review your resume and keep fine-tuning it.
- Read articles on how to dress and behave for interviews. Ask friends in the business world to conduct mock interviews with you.
- Constantly look for job resources.

- Go beyond simple job searches on the Internet – look for websites related to cities and then look for links to businesses and job opportunities.
- Try "cold calling" the human resources departments of area businesses to see if they are hiring or know of businesses that are hiring.

Adopt a practical approach that fulfills the immediate goals while maintaining an alignment for the long-term career track.

- It is a good idea to accept a workable job. Active regular income is a core requirement. Job hunting while having a current position is dealing from a position of strength.

- Recognize that you will not achieve your career goals with your first job. Use the job to learn, as well as develop skills.
- Use the first job to reinforce what you learned in school and modify your knowledge where necessary.

Relentlessly use your experiences to fine tune the practices and approach to enhance chances for success.

- Cultivate an attitude of self-criticism, not as a put-down, but rather to fix problems and improve skills.
- Use the pain of failure as a learning tool
- Continually seek to learn new skills.

Never forget your key advantage.

The believer has a crucial advantage in being on the Lord's side. You can be comfortable that the Lord will guide events to suit His will. In so doing He is also working toward your growth, comfort, and happiness. Looking at such improbable events, from a human standpoint, as Joseph's elevation to the premiership of Egypt, Daniel's authority in Babylon and David's anointing to the kingdom, we can clearly see God's authority over human events. He clearly has a ministry for you.

Conclusion

Over the long term, if you envision a 30 to a 50-year career in technology, roles and specialties wax and wane. The ability of the IT professional to move smoothly from one position to another as times change has been described variously as "keeping one's parachute packed" or "being able to consistently land on one's feet." This is another way of demonstrating the importance of having a thorough understanding of the industry and not getting locked into a particular technology or skill set.