Career Expectations for the GIS Professional: Utilities

This is the final part of three articles pertaining to what to expect as a GIS Professional on a chosen career path. Part 1 focused on what one can expect if they choose a career in government, while, Part 2 focused on what to expect in the private sector.

Utilities are a Diverse Assortment

There are a wide variety of utilities. At face value there is water, gas, electric, and sewer. But, take a deeper dive, and you will find that utilities present the greatest opportunities for the GIS professional. Water Utilities, for example, include Drinking Water (Potable), Recycled Water, and Irrigation Water used to manage agriculture. Sewer Utilities include Sanitary Sewer and Storm Sewer. Then you have Gas utilities - which type? There are gas transmission utilities and gas distribution utilities. Consider Oil. This is also a utility and consists of Upstream (Source), Midstream (Pipelines), and Downstream (Customer). For Oil, the greatest opportunities for GIS reside in Midstream.

GIS and utilities go hand in hand. They both need each other. In the world of utilities, GIS is not a luxury, it is a necessity from the operational and regulatory standpoints. Whether it is a private or government utility, it offers tremendous growth potential, along with complex challenges, for the GIS Professional.

So, why GIS?

Let’s break apart how utilities see GIS as a must have: Every utility has Operators, Maintenance Crews, Heavy Equipment Operators, Electricians, Instrumentation Technicians, Construction Inspectors, and Engineers. Operators are people who turn the valves and monitor the pipelines. They are heavily dependent on map books or GIS-based mobile apps to locate, for example, a specific valve to close or open. Therefore, having the location and key attributes available to them while in the field, such as the number of turns to close a valve is critical. When a water pipe breaks, it can mean the difference between someone's home getting flooded or not; stopping the leak by closing a valve is time critical.

Maintenance crews fix broken equipment. They may not need to use a specific GIS application, but it is common for them to interface with GIS via their computerised maintenance management system (CMMS). Most utilities have, or are likely developing a CMMS which tracks maintenance and work orders done on equipment. It is common for a CMMS to have a GIS map viewer tool embedded inside its software. This provides the user the option to access a map showing the location and work orders associated with a piece of equipment. Heavy Equipment Operators use GIS to find out what is buried below them before they dig up a broken pipe needing repair.

Electricians use GIS to find out where the substations, transformers and electrical manholes are located. This also includes where the cables/wires come from and go to. Instrumentation Technicians need to know where the SCADA (Supervisory Control and Data Acquisition) sensors are located and which assets they monitor. Construction Inspectors need to know what utilities are buried where on their project site. Maps and utility field markings, based on GIS, provided to the Construction Inspector before construction begins has a proven track record of saving time, money, and making everyone safer. Engineers use GIS for hydraulic modelling, asset management, and project planning/site selection. Collectively, all these people can be referred to as your customers.

It’s about People, not Technology

Working with such a diverse group of customers presents its own challenges. Each group has their own goals and objectives, some may not necessarily correspond with the other groups. The success of your GIS will depend heavily on your ability to

cultivate positive relationships with these customers. If you are a person who has little or no people skills, it is in your best interest to learn these skills. It is people that power the GIS, not software or servers. Trust is also important. You must gain the trust of these customers. This is done by learning what they do and how they do it. None of this is taught in school or a GIS certificate program - it is learning as you go. It is learning as you go. To be successful, you must teach yourself more than just GIS software and databases. It is about how the systems within the utility work together, the language/slang used to refer to equipment, and of course the equipment itself. For example, ask yourself how does a Switchgear function? What is a Single-Line Diagram? What is the difference between a Lift Station and Pump Station? What is the difference between a Plug Valve and Gate Valve? If you can master the art of understanding your customer you will exponentially increase your chances of success. The greatest satisfaction you can derive will be witnessing your hard work in action and seeing the results of your efforts as a critical piece to a cost-saving decision or innovative idea.

But, be wary, utilities are not a perfect world for GIS. It is important to understand that from the management side, expect to see mostly Engineers in these roles. This can be an issue for the GIS Professional since the prevailing industry philosophy is that anyone with a degree in engineering is automatically qualified to be a manager. As a result, it is not uncommon that you, the GIS professional, will be supervised by someone who is myopic, obdurate, and antithetical to the unifying philosophy of a GIS. As was mentioned in the previous articles in this series, it will be up to you to educate all individuals in the value GIS can provide to the organisation. This is best achieved by mastering the art of public speaking. It is best to keep an informal strategy that could include lunch n' learn workshops, e-blasts with fantastic updates on GIS, and most importantly, simply walking around and getting to know your customers (including where they work) by getting into the field and seeing them in action. Maximise your face time with them - such as eating with them in the lunchroom or chatting with them during their breaks. The more they see you, the better they get to know you, the more they will trust you, and the more likely they will become your biggest supporters. After all, in utilities, the best ideas come from the bottom up, not the top down. Most of these customers may not know what a GIS is, but they do know it makes their jobs easier and safer.

Utilities are "real GIS"

Expect to engage in a wide variety of projects. Utilities is where "real GIS" resides. Almost every task you can expect to engage in is mission critical to the utility. Systems Integration, for example, the joining of GIS to Customer Billing Systems or GIS with Asset Management Systems is vital. GIS provides the ability to instantly notify customers of a power outage or water service interruption. GIS can explain which pipelines or assets are at greater likelihood of failure. Engineering, with the use of GIS for Subsurface Utilities Engineering (SUE), is a process being widely adopted by many utilities. It is the identification, location, and verification of buried utilities in an area at various phases of a project's design before construction actually begins. The data collected is stored, retrieved and manipulated in GIS. This process, when joined with GIS, has been proven to save thousands, and in some cases millions of dollars on an engineering project. Hydraulic Models are necessary for the understanding of how a water system is functioning. It answers questions such as, 'How much more demand can the system handle before a new pump station needs to be added?' and 'Does the system have enough reservoir capacity?' These models are built and calibrated using GIS.

Do you still want to work in GIS?

Knowing more about who works where and salaries is important also. According to the 2011 URISA GIS Salary Survey, almost 66% of GIS professionals are employed in the government sector. Of this number, 22% work in the public utilities sector. There is no information on the percent of GIS professionals who work in the private utilities sector. But, GIS is equally mission critical to public and private sector utilities. GIS professional salaries are less than those of most other IT sectors. Given the importance of GIS to the organisation, it remains a mystery as to why this appears to be the case. However, do not let this discourage you from starting a GIS career.

The end has come to the final article in the series. You will notice some common themes in this series: 1) GIS, even after being around for 45+ years, is widely misunderstood; the infernal question of "What is GIS?" will follow you throughout your career; 2) Those who will supervise you will rarely understand, or take interest in, what you actually do; 3) Everyone says they want GIS, everyone says they need GIS, but they consistently fail to dismantle the silos and barriers that are necessary for it to be successful across the entire organisation; 4) Everyone thinks they can "do GIS" - this will be of tremendous annoyance to you as the GIS professional; 5) Expect resistance from the more entrenched IT people within the organisation. After all GIS is about change and change is very difficult for many decision-makers, particularly in the government sector. It will be up to you to effectively avail yourself of the geo-neophytes among your customers so that they can be useful to your endeavors. Given these realities, you as the GIS professional must choose wisely which areas in the organisation you feel GIS can succeed and disregard those areas where failure is highly likely. This is best achieved by gaining a thorough understanding of every aspect of the organisation you work for.

Do not let the recent paradigm shifts in the GIS profession discourage you. The advent of cloud-based computing, open source GIS, real-time data acquisition, and other innovations, will work to your advantage. One way is that these technological advancements provide you more time to focus on the people you are there to help. Ultimately, this encourages the free flow of ideas and furthers innovation.

GIS can be a rewarding career. It is one of the few IT-related careers where creativity, holistic thinking, artistic visualisation, and working face-to-face with your customers in all environments predominate. You may witness others in the IT profession earning more money than you, however, rest assured that your job is more fun!

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