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9-2 Final Project

**Situational Analysis**

When a small business is getting off the ground, they tend to make decisions that will simply keep them alive. Like a baby lion in the wild, small businesses need to survive in this large world. Sometimes decisions are made inside of the company that are best for short term survival but not long-term thriving. Most companies call these growing pains, the truth is there isn’t much growing pains in most cases but it’s reteaching employees the correct way to do things. This is the case with Top Secret Incorporated (TSI). TSI is a very successful company that makes small embedded operating systems for large enterprise businesses. They have found much success in their clints, but their own operations are heavily weighed down by themselves. Every company comes to a place where they need to change the way they are structured. Even larger megacorporation’s like Google and Facebook must be restructured to stay alive. Google went under a reconstruction a few years ago in 2015 and changed its parent company to Alphabet. This means that google is just a child company under something else. Although there are many reasons something like this happen this is what people call growing pains. Although TSI isn’t as large as google/alphabet this doesn’t mean they don’t have some growing pains of their own. This organization is internally faced with a limitation on their productivity and operations based on their own doing. TSI uses their production embedded OS as a main OS for their internal employees and operations. This problem was created in the beginning of the company when they simple couldn’t afford a more expensive OS for employees to use. This problem has begun to cause a plethora of issues from being stuck on one task at a time to large security issues being that the OS isn’t the most secure by design. TSI’s operating system is built for a specific purpose which it does very well, however that does not work for internal operations. Another company that faces challenges in the same way is a company named YouVersion. This company creates a large scale SAAS application for hundreds of millions of people to use. The current problem that this company faces is due to its own rapid uncontrollable growth. The application faces many problems growing pains but one to specifically point out is how the databases that the company currently uses are so heavily depended on it’s almost impossible to make any update or maintenance to the database. Most applications now a day’s use the Cloud for high availability and simplistic rolling updates. Yet when this company was created, they couldn’t afford cloud services and were stuck maintaining their own servers. With the company closing in on a billion uses quickly it becomes more and more difficult for internal operations to support this monstrous application. TSI is not alone in their journey of everlasting evolving however they are slowed down by their own doing.

**Analytical Organizational Profile**

| **GPOS Feature** | **Profile Criteria** | **Student Analysis** |
| --- | --- | --- |
| **Multiprogramming** | Tech Description | Multiprogramming is when several applications are ran in different stages of execution but are still on a single I-steam engine. This allows multiple applications to use the CPU not at the same time but in schedule with each other whereas without it CPU utilization would go up and down tremendously. |
| Business Requirement | From a business perspective without having multiprogramming computers CPU’s would be tasked with one job at a time and couldn’t multitask. In highlight speed would be slowed down and thus productivity slowed. It used to talk people days to program simple systems and now it can be done in minutes because of this. |
| **Multiprocessing** | Tech Description | Multiprocessing is the running of multiple programs on a computer running at a single time from a CPU. For example, a web browser and email application running at the same time. |
| Business Requirement | In the absence of multiprocessing a company from a business perspective would end up losing productivity due to having to wait and work with one program at a time. |
| **Multithreading** | Tech Description | Threads can execute different parts of a program side by side with other threads to help processes run quicker. Although they cannot run at the exact same time if using the same CPU, splitting threads up on different CPU’s can make a process run much quicker. |
| Business Requirement | Without multithreading we would be limited to the old way of computing where we have to wait for each command to be finished after the other. Threads are inside processes and therefore without them process/applications would take longer and again decrease productivity and ultimately money. |
| **Virtual Memory** | Tech Description | Virtual memory allows for applications to run without having to worry about conflicting memory in other applications. The virtual memory is passed on to the OS and then the OS will schedule the memory with physical hard drives or RAM. |
| Business Requirement | Losing virtual memory would mean that in certain circumstances that applications should use duplicate memory the effect of this could be anything from crashing to completely wiping all your memory and losing everything. Ultimately if you lost of all your things you would be losing money as well especially if it’s a banking system. |
| **System Call Interface** | Tech Description | System calls provide an interface to the services from the operating system. In other words if an application needs access to resources that it doesn’t have permission to have it can make a call to go into kernel mode this call is the system call interface. |
| Business Requirement | Without having this functionality applications would have to run in a certain mode that if it crashes the whole system would crash. Having these calls allows for more stability in user workflow. More stability in workflow means more productivity and more money. |
| **Security** | Tech Description | Security is the state of being free from a danger or threat. This is an important feature when it comes to technology since someone can impersonate another person and take what they do not own. |
| Business Requirement | Security needs to be a priority, since without it there is a possibly that an organization can be hacked and ransomed for money. |
| **Device Drivers** | Tech Description | A device driver is a group of files that controls some sort of hardware for the computer. These files communicate with the OS to be able to use the physical device. |
| Business Requirement | Device drivers enable organizations to be able to use modern hardware. Without device drivers computers would not be able to connect to the internet. In case not able to be productive and therefore not make any money. |
| **Fault Tolerance** | Tech Description | Fault tolerance is somewhat of a safety net in case applications or hardware break the entire system doesn’t crash. Similar to a ground line in electricity many times it can stop a major issue. |
| Business Requirement | In an example if you’re working on a school project and your computer dies you don’t want to lose all of your information so as a fault tolerance the computer in some OS’s will save your work as a final process. |

**Full Organization Profile**

| **GPOS Feature** | **Profile Criteria** | **Student Analysis** | |
| --- | --- | --- | --- |
| **Multiprogramming** | Tech Description | Multiprogramming is when several applications are ran in different stages of execution but are still on a single I-steam engine. This allows multiple applications to use the CPU not at the same time but in schedule with each other whereas without it CPU utilization would go up and down tremendously. | |
| Business Requirement | From a business perspective without having multiprogramming computers CPU’s would be tasked with one job at a time and couldn’t multitask. In highlight speed would be slowed down and thus productivity slowed. It used to talk people days to program simple systems and now it can be done in minutes because of this. | |
| **Multiprocessing** | Tech Description | Multiprocessing is the running of multiple programs on a computer running at a single time from a CPU. For example, a web browser and email application running at the same time. | |
| Business Requirement | In the absence of multiprocessing a company from a business perspective would end up losing productivity due to having to wait and work with one program at a time. | |
| **Multithreading** | Tech Description | Threads can execute different parts of a program side by side with other threads to help processes run quicker. Although they cannot run at the exact same time if using the same CPU, splitting threads up on different CPU’s can make a process run much quicker. | |
| Business Requirement | Without multithreading we would be limited to the old way of computing where we have to wait for each command to be finished after the other. Threads are inside processes and therefore without them process/applications would take longer and again decrease productivity and ultimately money. | |
| **Virtual Memory** | Tech Description | Virtual memory allows for applications to run without having to worry about conflicting memory in other applications. The virtual memory is passed on to the OS and then the OS will schedule the memory with physical hard drives or RAM. | |
| Business Requirement | Losing virtual memory would mean that in certain circumstances that applications should use duplicate memory the effect of this could be anything from crashing to completely wiping all your memory and losing everything. Ultimately if you lost of all your things you would be losing money as well especially if it’s a banking system. | |
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| Business Requirement | In an example if you’re working on a school project and your computer dies you don’t want to lose all of your information so as a fault tolerance the computer in some OS’s will save your work as a final process. | |
| *Recommendation: Your recommendation should map the technology you have described above to the overall requirements of TSI and their endeavor to implement TSO OS in their back office. Your recommendation should not be a simple regurgitation of the facts above.* ***Imagine you are presenting a summary of your findings and a recommendation to a busy executive.*** *Give a crisp, one-paragraph summary that defines how TSI will move from the current state to a future state that implements an operating system with all of the capabilities necessary to meet its requirements.*   | *Insert recommendation below* | | --- |   Moving forward TSI will focus on using all the GPOS features listed above. Our focus will be on the code we write for our applications. We will focus heavily on multithread and multiprocessing. This will help our application produce high performance when dealing with large amounts of data. This is exactly what we need to help grow our company to the next level. Most users leave if a product isn’t working within five seconds. This will help ensure that all our processes work right away within milliseconds. If we want to move forward as a company this is the way, it happens. We have to continue innovating or we will begin to fade away as a company. | | |

**References:**

Guardian News and Media. (2015, August 11). *Why google is restructuring, why the name alphabet and how it affects you*. The Guardian. Retrieved January 12, 2022, from https://www.theguardian.com/technology/2015/aug/11/google-alphabet-why-change-restructuring-what-it-means