



Company XYZ Technology Due Diligence Report (DRAFT)

Focus Area	Findings	Opinions/Recommendations
IT - Current Plans and Activities		
Existence of a current active project list	<p><i>A formal list is not maintained. The CTO maintains an informal mental list.</i></p> <p><i>Current projects include replacing the Linux firewall in City A with a Watchguard X20 firewall, adding a DSL failover in the CITY B office and adding Cisco VOIP phones in the CITY B and City A offices.</i></p>	<p>A more formal project list should be maintained and communicated to management and staff. This will provide better visibility and improve management oversight of IT projects and initiatives.</p>
Existence of a project management process	<p><i>A formal project management process does not exist. Projects are managed informally. Prioritization of projects is done informally based on senior management's assessment of current business priorities.</i></p>	<p>The lack of a formal project management process is normal in a small company like Company XYZ. The lines of communications and decision making are short and generally senior management is involved in making major IT decisions. As the company grows it will become much more important to establish an IT governance model that ensures that appropriate steps are followed in running IT projects. A proper IT governance model assures that the organization is focused on initiatives that directly support the business objectives. Basic IT governance is ensuring the company is spending the right amount on the right things at the right time.</p>
IT - Organization Structure and Capabilities		
Existence of an IT organization	<p><i>IT responsibilities are currently handled in City A informally by Kevin Mills who is normally responsible for manufacturing and John Harrell who is normally responsible for development of the G-100 site controller.</i></p> <p><i>In CITY B IT responsibilities are handled by the CTO.</i></p> <p><i>IT responsibilities for both locations will transition to the CTO</i></p>	<p>Given the current split of responsibilities of IT support, and the lack of documentation, there is risk in the support of the IT environment. This is typical in a small organization such as Company XYZ. This risk can be lowered however, by having a standards based environment that includes standard hardware and software and written policies and procedures for supporting the IT environment.</p>



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IT organization design and capabilities	<i>The IT organization is currently split between City A and CITY B and is performed in part-time roles handling all user issues.</i>	The current IT organization is adequate to perform its duties. However, an emphasis on creating a standards based environment for IT will be help especially as the company grows over the next few years.
IT - Governance Process		
Process for selecting IT projects <ul style="list-style-type: none"> • How are IT projects proposed? • Is a business case developed? • How is a project selected for implementation? 	<i>A formal process does not exist. Projects are proposed and selected for implementation based on discussions among senior staff of the company.</i>	A formal governance process is not necessary for an organization as small as Company XYZ. However, a project initiation process with a single form used to capture basic information about a project such as requirements, budget, timelines and resources will aid the company in managing resources better.
IT - Budget Management		
IT budget <ul style="list-style-type: none"> • Is there an IT budget? 	<i>A budget has been defined for projects over the 6-9 months. An overall IT budget does not exist.</i>	Creating and managing a budget encourages a more focused planning mentality. It also provides a basis on which decisions can be made. We recommend that at least a rudimentary annual or semi-annual budget be developed and tracked.
Budget management process <ul style="list-style-type: none"> • How is the budget created? • Is there an IT related chart of accounts? • How is the budget managed on an ongoing basis? 	<i>None exists. The goal is to minimize IT expenses each time a decision to undertake ongoing expenses is made.</i>	See above.
IT - Infrastructure		
IT infrastructure – desktops and laptops	<i>The company has about 20 desktop PCs and about 5 laptop units. The desktops include 3 newer Dell PCs. Most of the desktop equipment is older but functional. The laptop</i>	With the current level of equipment on-site a spreadsheet and/or departmental database is recommended for tracking



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<ul style="list-style-type: none"> • What types of desktops and laptops are being used? • How are software licenses managed? • Any software that does not have licenses? • What is the number and type of desktops and laptops supported? • What is the process for imaging the machines? • How are these machines supported? • Any key issues? 	<p><i>equipment is 4 Dell Latitude model 820s and one Sony laptop.</i></p> <p><i>The desktops are running Debian Linux software and other open source development tools.</i></p> <p><i>The laptops are running a combination of Windows/XP and versions of Linux.</i></p> <p><i>Software on the Laptops includes Microsoft Office, Adobe Acrobat and Microsoft Visio. Licenses exist for this software and is maintained informally.</i></p> <p><i>Support is provided by XX in City A and YY in City B.</i></p>	<p>software licenses if it is well maintained</p> <p>There is no technology refresh plan and so there are a number of machines that are outdated. We recommend a technology refresh plan be implemented that would replace one third of the desktop equipment and one fourth of the server equipment every year. We recommend that equipment be purchased from top-tier vendors and include extended warranties to mitigate any costs of replacement in case of failure. We also recommend that software be maintained at no more that 2 versions older than current versions to ensure adequate vendor support.</p> <p>A set of standard configurations should be established to ease the burden of hardware replacement on failure. It will also assist in the management of software licenses and reduce the time required for system setup and configuration.</p> <p>The current support process is adequate for Company XYZ.</p>
<p>IT infrastructure – PBX, network and servers</p> <ul style="list-style-type: none"> • Describe the current telephone system. • Describe the Wide Area Network and connection to the Internet. • Describe the Local Area Network • Describe the server environment • Describe the current data center environment • Any key issues? Downtime? 	<p><i>Phone service is provided via a 15 year old PBX in City A with 4 outgoing lines. The PBX provides about 15 lines currently.</i></p> <p><i>In CITY B, a new outsourced VOIP solution has been implemented through Covad. Covad is also the provider of the network connection via a T1 in CITY B. A DSL backup has been provisioned through Covad.</i></p> <p><i>In City A, a T1 line is provisioned through Qwest which carries both the data link as well as the 4 telephone lines connected to the PBX.</i></p> <p><i>The local area network in City A consists of three network segments provisioned off a Linux firewall. The segments are</i></p>	<p>The decision to outsource to Covad for phone service is a good one. The company should make sure that an adequate service level agreement exists for this service as it is a critical service. If no agreement is found one should be negotiated if possible to ensure that response time to system outages are resolved in a timely manner.</p> <p>A single T1 connection is adequate for the level of data and voice communication that is taking place today. With a moderate increase in bandwidth usage or personnel with telephones, the service will begin to degrade. When that happens we recommend that a second T1 line be installed. It should enter the building via a different route than the current T1 to mitigate the risk of having both lines out at the same time. The lines should be bonded together so the traffic is balanced between the line which will provide for both</p>



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	<p><i>respectively for the internal network, the lab network and a DMZ network.</i></p> <p><i>The internal network is directly connected to the Costco network through a T1 provided by Costco through ATT.</i></p> <p><i>The data center consists of 4-5 racks in the lab environment in City A.</i></p> <p><i>Plans exist to procure colocation services in CITY B and place many critical servers at that facility in the next few months.</i></p> <p><i>There are about 20 servers of varying age in the data center in City A. One of these servers is used for storing the code base for the company.</i></p> <p><i>On the DMZ network, one server is used for DNS, one for external mail connectivity and one for hosting the WEBEnterprise application for a customer – Boston College.</i></p> <p><i>A number of servers are provisioned on the lab network to be used for various tests with various HVAC and Electrical equipment.</i></p> <p><i>Support for the servers is currently provided by John Harrell, team lead for the SCS development team in City A.</i></p>	<p>redundancy and balanced usage.</p> <p>We recommend that the network diagram be updated and maintained as part of the standard operating procedure. This will facilitate better management of the network and will aid in troubleshooting.</p> <p>There are several servers that are currently or will soon be unused. Those servers should be removed from the network and replaced by new equipment as needed. Additionally we recommend that critical servers be placed in a more secure environment that also provides the proper power and environmental controls.</p> <p>The direct connection between the Costco network and the Company XYZ network gives rise to needless risk. Installing a firewall at Company XYZ on this link will decrease the exposure to both Costco and Company XYZ.</p>
<p>Quality of support processes including monitoring</p> <ul style="list-style-type: none"> • Describe the support processes for IT equipment • Is there a Service Level Agreement (SLA) established? 	<p><i>There is no monitoring system in place</i></p> <p><i>Currently, there is no change management process in place.</i></p>	<p>A monitoring system provides information that allows for notification in the event of failure. We recommend that a basic monitoring system be installed to facilitate proactive management of the computing environment.</p> <p>The IT Manager can use the basic monitoring system to provide metrics on the 99% uptime goal and how well IT is</p>



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<ul style="list-style-type: none"> Is there a change management process to manage changes? 		<p>doing in reaching and maintaining that goal. This information will also help to determine problem areas that should be analyzed to facilitate proactive versus reactive management.</p> <p>A change management process helps ensure that only changes that are necessary and authorized are put in place. It also provides for roll-back of unsuccessful changes. We recommend that a basic change management system be implemented.</p>
<p>Outsourced components</p> <ul style="list-style-type: none"> Are any components of the infrastructure outsourced? Describe the support agreements with the vendors 	<p><i>In CITY B the VOIP telephone service is outsourced to Covad.</i></p> <p><i>A support agreement exists for Covad and Qwest for VOIP and network services.</i></p> <p><i>The company web site is hosted at Media Temple.</i></p>	<p>We recommend that the Service Level and Support Agreement with Covad, Qwest and Media Temple be reviewed to ensure that they are adequate for the needs of the company.</p>
<p>IT helpdesk and processes</p> <ul style="list-style-type: none"> Is there an IT helpdesk? Describe the IT helpdesk support processes Is there an SLA for the helpdesk? Any tools used for helpdesk management? 	<p><i>There is no formal IT helpdesk.</i></p>	<p>Since there is no formal helpdesk, it is difficult to determine if there are common problems which could be easily fixed with a single solution. At a minimum Company XYZ should establish a basic call tracking system that would allow gathering data on what types of problems are being reported. Such a system could be used for Company XYZ customer support as well as for internal IT support. Many good open source packages are available for use.</p>
IT - Applications		
<p>E-commerce applications (web based)</p> <ul style="list-style-type: none"> Are there any applications supporting company revenue streams? Describe the infrastructure for these 	<p><i>There is no e-commerce application. However the company's eWebEnterprise application is deployed in several versions at customer sites as well as hosted at Company XYZ and used by customers in near real time to provide information about their energy usage patterns and other similar applications.</i></p>	<p>The servers hosting the eWebEnterprise application for Boston College in City A should be moved to a collocation facility. In the future all customer hosted solutions should be located in a commercial facility. This approach should be employed until the need grows to over 20 racks of servers at which point the company should consider the costs of</p>



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<p>applications?</p>	<p><i>A prior version of eWebEnterprise for ZZZ College is currently being hosted in the lab environment in City A.</i></p>	<p>developing an in house data center of commercial quality.</p>
<p>Applications supporting financials</p> <ul style="list-style-type: none"> • What applications support the financial processes of the company? • Describe the infrastructure environment • Describe the support environment • Any key issues? Downtime? 	<p><i>Quickbooks is installed on a single PC and accessed by two persons from their PCs for recording and maintaining financial data.</i></p> <p><i>An outside accounting person comes in once every two weeks to perform accounts payable and other tax related functions.</i></p> <p><i>Sales Force is being considered for the sales team.</i></p> <p><i>NetSuite is also being considered as an integrated application to support the future needs of the company.</i></p>	<p>Steps should be taken to ensure that the data from Quickbooks is backed up regularly. This can be done over the network to the CITY B location or by using a local tape mechanism.</p> <p>The company plans to evaluate the advantages of moving to SaleCity Brce versus moving to a more integrated hosted package such as NetSuite. Doing so has the potential to lower the costs of integrating data between the Financial and Sales tracking systems.</p>
<p>Applications supporting company business processes</p> <ul style="list-style-type: none"> • Are applications fully implemented? 	<p><i>The company website is hosted at Media Temple. It was recently developed by One house.net in CITY B.</i></p>	<p>The company should ensure that there is an adequate service level agreement with Media Temple.</p>
<p>Application development and/or implementation processes</p> <ul style="list-style-type: none"> • Describe the company IT applications development / implementation process 	<p><i>Please see the product development process description further in this document.</i></p>	
IT - Policies and Procedures		
<p>IT Privacy Policy</p> <ul style="list-style-type: none"> • Is there a Privacy Policy in the company? • How is this enforced? 	<p><i>None exists.</i></p>	<p>The company should develop a privacy policy associated with the gathering of customer data on the hosted version of eWebEnterprise. This will define the process for collection and adequate protection of customer data thereby lowering risk for the company.</p>



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IT installation and support procedures <ul style="list-style-type: none"> • Are IT installation, operations and maintenance procedures documented? • Are they used in supporting the systems? • How are they updated? 	<i>There are no written procedures.</i>	To ensure that consistent installation and maintenance is performed on all equipment, we recommend that written IT procedures be developed, published and reviewed on a regular basis.
IT - Security and Controls		
Security Policy <ul style="list-style-type: none"> • Is there are Security Policy? • How is it enforced? • How are violations and exceptions discovered and addressed? 	<i>There is no formal Security Policy. However the IT Manager is the only one with admin rights on all machines. Laptop users have limited administrator rights but do not have install/uninstall rights.</i>	A written security policy is recommended. Regular review of system configurations and installed software should be performed to uncover any inadvertent violations. Exceptions to the written policy should be documented and reviewed regularly. Since there is no formal Security Policy there is no way to discover any violations. We recommend that a minimal set of documentation be kept on changes to the configuration of all systems. This will provide the basis for a future security audits and ensure that basic change management processes are in place.
Security Controls <ul style="list-style-type: none"> • Are there controls for user access, passwords, anti-virus, anti-spam, network, servers, and applications? 	<i>Security controls are informally managed based on best practices. There are no formal written policies or procedures. A WatchGuard X20 firewall has recently been implemented in CITY B. Another similar set up is planned in City A.</i> <i>The current firewall in City A is Linux based. SpamAssasin is the open source package used for spam protection.</i>	As stated above, a more current, standard firewall configuration should be deployed in City A. A firewall to further isolate the Costco network from the company core network in City A should be deployed. This will reduce network security risk.
User account lifecycle management process <ul style="list-style-type: none"> • Describe the process for account 	<i>No formal account management process is in place. The manager of the development team performs this function</i>	The informal account management process appears to be adequate. We do recommend that the live accounts be audited regularly to ensure that there are no defunct accounts still in use.



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management	<i>informally.</i>	
IT - Backup and Disaster Recovery		
Existence of backup procedures <ul style="list-style-type: none"> • Do backup tapes exist? • Are they being rotated offsite? 	<p><i>Backups of the code base is done on DVDs once a week and kept at the home of the manager of the development team in City A.</i></p> <p><i>There are no backups of local desktop systems</i></p>	<p>The backup procedures cover the basic needs of Company XYZ with the exception of data that is stored on desktop and laptop systems. There appears to be a significant amount of business critical data that is stored on local desktop systems. We recommend that a central file storage system be purchased and installed for storage of all business critical data. This could be a standard file server or, if volumes warrant, a more robust solution such as a Network Attached Storage (NAS) or a Storage Area Network (SAN) could be acquired to serve this function. With the addition of this larger backup requirement a centralized more robust tape backup, storage and rotation system should purchased and installed. This could be in the form of a single solution to cover both locations of the company.</p>
Existence of disaster recovery plan	<i>There is currently no disaster recovery plan</i>	We recommend that the disaster recovery plan be completed and tested as soon as possible.
Annual testing of disaster recovery plan	<i>N/A</i>	The disaster recovery plan should be tested annually.
IT - Vendor Relationships and Support Structure		
Outside vendors providing IT equipment and services <ul style="list-style-type: none"> • Which vendors are used for providing IT products and services? • Are there preferred vendors for services? 	<p><i>PC equipment is now being purchased exclusively from Dell although there are a number of 'white-box' systems still on site.</i></p>	<p>The service and maintenance agreements with all of these vendors should be reviewed and renegotiated if necessary.</p> <p>Hardware purchases should continue to be made from first tier vendors. We recommend that extended warranties be purchased that will coincide with the recommended technology refresh plan. This will ensure that the hardware</p>



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<ul style="list-style-type: none"> • Are there agreements with IT vendors? 		<p>can be quickly replaced in the event of failure.</p> <p>General purpose software purchases should continue to be made from major vendors. We recommend that the software be maintained at no more than 2 versions older than current to ensure adequate vendor support.</p>
Product Platform - Architecture		
<p>Product Architecture</p> <ul style="list-style-type: none"> • Basic architecture • Supportability • What hardware is used to deploy the product? • What components are off the shelf? • What components are developed? • What features are planned for the product in the near future? • supportability 	<p><i>The company's products consist of the eWebConnect family of products which includes three products:</i></p> <ul style="list-style-type: none"> • <i>eWebEnterprise</i> • <i>eWebSCS</i> • <i>eWebDrivers</i> <p><i>eWebSCS(G-100) is the site controller server that is typically deployed in a customer facility. This product performs the function of monitoring and collecting data from a disparate set of HVAC and Power equipment. It can also interface with lighting control. eWebSCS is based on a small enclosure sourced from Advantek/Bell Micro. A custom board has been added to add Com2, another serial port capability. The package includes 128 Meg of RAM and 128 Meg of Flash memory. A stripped down version of Linux and the Company XYZ application fit within about 30 Meg on the Flash memory leaving plenty of space for storing log and alarm data and other collected information. The RAM is used for temporary storage that is not critical to the operation of the system in the event of power loss. Enhancements for the future will include any customer request features for monitoring and control of facilities equipment. Additional enhancements include enhanced driver architecture, a driver development toolkit, a thin client interface for programming and improved log file</i></p>	<p>The basic architecture of the G-100 product is a good choice of commodity components that can be sourced easily at low costs. In the future, the company may consider adding additional custom boards to the package to increase the input/output capability as needed.</p> <p>The features planned for enhancing the G-100 software are a good set of features to improve the product. The company should consider adding additional security features such as encryption of the traffic between the G-100 controller and the eWebEnterprise application and also improving the options available for mutual authentication between the G-100 and the eWebEnterprise. This can be done using the Secure Sockets Layer or Transport Layer Security mechanisms.</p> <p>The planned feature of developing a driver development kit will improve the ability of the product to be sold through other larger channels in the future. Hence it is an important feature to add for the future growth of the company.</p> <p>The database design of the eWebEnterprise application is an improvement that will allow the product to scale up efficiently. From an architectural perspective, a standard appliance version of this product will aid in reducing the cost of deployment and support, thereby lowering the cost for</p>



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	<p><i>handling.</i></p> <p><i>The eWebDrivers component is a set of drivers that has been developed by the company to allow the SCS to talk with HVAC equipment and electrical panels made by various manufacturers. Drivers are available for BacNet, LonWorks and Modbus. A number of proprietary drivers are available as well.</i></p> <p><i>The eWebEnterprise component is a relatively newer product for the company. This component is capable of providing customers with an enterprise level view of alarms and data across all deployed site controllers for all applications across the enterprise. Applications available include monitoring, reporting, alarming and control functions. This application is currently implemented on an open source platform based on Ruby on Rails and interfaces with standard SQL supported databases. Currently this application is deployed at two major customer sites. Future enhancements include adding a scalable hardware platform for this product and optimization and redesign of the database.</i></p> <p><i>The product is supported by a team currently in City A. Per the management of the company there have not been many support issues with the product.</i></p>	<p>customers.</p>
Product Platform – Performance and Scalability		
<p>Product Performance and Scalability</p> <ul style="list-style-type: none"> • What platform options are available? • How many customers/locations can be supported? • How does the product perform? • How does the product scale up? 	<p><i>The G-100 site controller has the ability to monitor and control up to 2000 points. Given the amount of processing power available in the 586 processor and the memory available in the flash memory, the bottleneck if any is in the input/output capabilities of this unit.</i></p> <p><i>If the equipment needing to be monitored can only be connected using a serial RS-232 connection, additional</i></p>	<p>The company should continue monitoring the availability of improved hardware and plan to upgrade the G-100 site controller periodically. This will ensure that the company stays current with available hardware technology.</p> <p>As needs dictate, the company should consider adding additional input/output capabilities to G-100 to increase its</p>



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	<p><i>controllers may need to be deployed due to limitation of the length of the RS-232 cables.</i></p> <p><i>Since the eWebEnterrpise application is not used for a real time application, the performance requirements are not critical. Currently the hardware required for this application is customer dependent. In the future the company has plans to produce standard appliance based versions of the product. This should make this product more supportable, profitable and scalable per the needs of the customers.</i></p>	<p>usefulness.</p> <p>In order to scale the eWebEnterprise application, the company should consider developing standard packaged versions of the product in an appliance model. The use of server clusters is recommended for both the web server and the database server to increase performance. Developing a few well defined configurations will be important in reducing complexity of configuration, deployment and support costs.</p>
Product Platform – Reliability		
<p>Product Reliability</p> <ul style="list-style-type: none"> • What features are built in to ensure reliability? • Are there options to increase reliability? 	<p><i>The Linux operating system in the site controller is fairly reliable due to the open source nature of this software. The Company XYZ application has been in the field for many years and has been tested over many years to be reliable. Changes being made to site controller software capabilities are minimal.</i></p> <p><i>There is considerable development underway on the eWebEnterprise application. The company has stated its desire to build a clustered server environment for various components of this application to make it more reliable. This includes both the web/application and database components.</i></p> <p><i>The development of the application in the Ruby on Rails environment also increases the inherent reliability of the product as the development in Ruby on Rails is relatively easier and less prone to errors.</i></p>	<p>The G-100 site controller is a fairly reliable server.</p> <p>To increase reliability of the eWebEnterprise application, a more defined software development process should be developed and employed. From a hardware perspective, clustering should be employed for higher availability configurations.</p>
Product Platform – Security		
Product Security	<p><i>The product is usually deployed within a customer network behind their network firewall. This is a reasonably secure</i></p>	<p>The company should consider adding additional security features such as encryption of the traffic between the G-100</p>



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<ul style="list-style-type: none"> What mechanisms are in place to ensure security of customer data and environment? 	<p><i>mechanism for facilities data carried via the network.</i></p> <p><i>However, in the cases where the product will be deployed in a hosted environment at a collocation facility, there is risk of network traffic being exposed to sniffing. It would not take much effort to reverse engineer the packet format to access the content.</i></p> <p><i>There is a minimal user id and password mechanism between the eWebEnterprise application and the site controller before access to log and alarm data is permitted. In our estimation, this is a weak mechanism for authentication.</i></p> <p><i>In the case of the Costco setup, there is a direct link between the Costco network and the Company XYZ core company network. This can expose the Company XYZ network to vulnerabilities in the Costco network as well as the reverse. This has the potential to expose other customers to unnecessary risk.</i></p>	<p>controller and the eWebEnterprise application and also improving the options available for mutual authentication between the G-100 and the eWebEnterprise. This can be done using the Secure Sockets Layer or Transport Layer Security mechanisms.</p> <p>An additional firewall should be deployed between the Costco network and the company's network in City A to improve network security.</p>
Product Software – Architecture		
<p>Product Software Architecture</p> <ul style="list-style-type: none"> Describe the product software architecture How is the software licensed? 	<p><i>The G-100 site controller is built on top of an embedded Debian Linux kernel. The application is written in C++ using GNU development tools. This combination of software is loaded in about 30 Meg of flash memory. Depending on the need, a number of drivers are configured to allow the G-100 to talk with a number of facility systems to facilitate monitoring and control functions. A small embedded web server allows access to the site controller configuration and data logs.</i></p> <p><i>The licensing for the open source components is based on GPL. Minor modifications were made in the past to the serial driver to allow certain specific functions. These modifications are licensed according to the requirements of the Linux GPL.</i></p>	<p>The current G-100 product software architecture is good. It is modularized, easy to understand, debug and support.</p> <p>The planned development of a driver development toolkit will be a good enhancement for the architecture.</p> <p>Ruby on Rails as the development environment and architecture for the eWebEnterprise application is a good choice. This choice leads to a cleaner and easy to extend and maintain architecture for the product.</p>



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	<p><i>All other Company XYZ application software is written using the application programming interface and is licensed as Company XYZ application software.</i></p> <p><i>The software for the eWebEnterprise application is written using the Ruby on Rails development environment and is licensed as Company XYZ software.</i></p>	
Product Software – Development Process		
<p>Product Software Development Process</p> <ul style="list-style-type: none"> • Describe the product software development process? • Development environment? • Software versioning? • Bug tracking? • DB design? 	<p><i>For the G-100 site controller, software is developed only for additional drivers to add additional monitoring and control functionality as requested by customers.</i></p> <p><i>The process consists of developing the specification for the driver, designing the driver, coding the driver and testing the driver before it is shipped to the customer.</i></p> <p><i>The development environment for the G-100 is Debian Linux, GNU tools, CVS for source tracking, and e-mail for bug tracking.</i></p> <p><i>The software development process on the G-100 can be characterized as basic, somewhere between the CMMI levels of 1(Initial) and 2 (Repeatable).</i></p> <p><i>The CTO has stated the company's desire to move to the following environment for development:</i></p> <ul style="list-style-type: none"> • <i>Environment – Eclipse</i> • <i>Code versioning – Subversion</i> • <i>Bug tracking – Fogbugz</i> • <i>Database design – Enbarcadero</i> 	<p>The planned improvements for the software development process are a step in the right direction for Company XYZ. These steps will enhance the company's ability to develop high quality software in the future for both platforms, the G-100 as well as the eWebEnterprise application.</p> <p>As the development group increases in size, it will be important to implement development policies and standards concerning tools and processes to increase overall quality of the product.</p>



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	<p><i>The eWebEnterprise software development process follows a model similar to the one for the G-100 site controller. On the CMMI scale, the process for the development of this application can be characterized as level 1 (Initial)</i></p>	
<ul style="list-style-type: none"> • Describe the software coding style (as compared to industry standards) • Describe the code organization 	<p><i>The software coding style is good when compared to industry standards.</i></p> <p><i>For the G-100 site controller, the software is well organized into Company XYZ System Objects with well defined properties to facilitate extensions, ease debugging and increase reliability.</i></p> <p><i>For the EWebEnterprise application, good organization is facilitated by the Ruby on Rails environment. Code writing and documentation practices are good.</i></p>	<p>Coding style and documentation practices are satisfactory. It will be important to continue to implement standards in this area as the development group expands.</p>
<ul style="list-style-type: none"> • Describe the software code versioning and deployment process (as compared to industry standards) 	<p><i>CVS is used for code versioning currently for both the G-100 site controller and the eWebEnterprise application. This is a dated code tracking environment that is lacking in additional features to aid in code deployment. The company wishes to move to using Subversion.</i></p>	<p>Moving from CVS to Subversion is a move in the right direction for the company. Subversion has better integration for the Ruby On Rails environment and will better support the goals of the company in the future.</p>
<ul style="list-style-type: none"> • Describe the unit and system testing processes • Tools? 	<p><i>Unit testing and system testing processes exist but are informal and based on the determination of the need by the individual developers. The processes are not documented. There are no automated tools for testing software except scripts developed informally by developers.</i></p>	<p>The testing procedures are lacking in process and formality. A written test strategy and procedures should be developed for each major release of the product.</p>
<ul style="list-style-type: none"> • Describe the development documentation processes 	<p><i>There is some documentation available for the functional specifications of pieces of the G-100 site controller software. It is not comprehensive.</i></p> <p><i>There is no overall, comprehensive specification, architecture or engineering design documentation available for the G-100 site controller software or the eWebEnterprise application.</i></p>	<p>Overall documentation for the product is lacking. Additional documentation should be developed by implementing standards for documentation for the development team.</p>



Company XYZ Technology Due Diligence Report (DRAFT)

Focus Area	Findings	Opinions/Recommendations
<i>Product – Engineering and Development Process</i>		
<p>Product Engineering and Development Process</p> <ul style="list-style-type: none"> Describe the product engineering and development process (iterative, architecture-centric, use-case driven) Is there a process? (requirements, requirements refinement, technical solution, verification, validation) Does each step in the process have metrics for performance? Are there policies governing the process? Is there a process plan? Are there adequate resources to execute the plan? Is there adequate separation of duties between development, test and production? Is training provided for individuals working with the plan? 	<p><i>The current engineering and development process can be characterized as the “Waterfall” model. This includes the steps of developing specifications, designing, testing, and deployment. Within the “Waterfall” approach the current process is rated between CMMI levels 1 (Initial) and 2 (Repeatable)</i></p> <p><i>Steps in the process do not include company defined standards metrics for quality. There are not any written policies for software development.</i></p> <p><i>There is not reasonable separation between the duties of development, testing and development.</i></p> <p><i>Some level of training is provided to the development team as needed. One example of this is the recent training provided to some developers in Ruby on Rails.</i></p> <p><i>The company wishes to move to an agile development methodology based on Scrum cycles of 3 months each.</i></p> <p><i>The CTO has stated the company’s desire to add more definition to the development process (through a Standard Operating Procedure manual) over the next few months in order to improve the overall quality of the process.</i></p> <p><i>The company’s plans to add several additional software developers in the CITY B office to increase the capabilities of the development organization.</i></p>	<p>The move to an agile development methodology is a step in the right direction for the company. While it will take some effort to implement, it will allow a more flexible approach to meeting customer requirements.</p> <p>Adequate separation of duties should be implemented between developers and testing staff. This will have the benefit of objectivity in the process and will improve the quality of the product.</p> <p>A standard operating procedure manual for development will be critical in allowing the company to scale software development while maintaining and improving quality especially as the staff will be split geographically across two locations – City A and CITY B.</p>