**5.0 Decision Analysis Phase**

**5.1 Identifying Candidate Solution**

As previously stated, there is currently no comprehensive system comparable to the Hospital Bed Management System. There are various Commercial off the Shelf (COTS) system alternatives available from hospital bed service providers, however they are geared for overall hospital bed administration. These choices, unlike the Hospital Bed Management System, are not based on a detailed treatment plan. Furthermore, many hospital bed service providers create their own systems because their needs are typically unique and commercial off-the-shelf solutions may not always meet them. Furthermore, these organizations have the necessary funds to develop their systems. The following feasibility analysis compares COTS to the planned Hospital Bed Management system in terms of general feasibility.

**5.2 Analyze Candidate Solutions**

**5.2.1 Feasibility Analysis**

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| **Operational Feasibility** |
| **Commercial Off the Shelf (COTS)** | The product will only be a broad solution because it will serve many hospitals. It will not suit all the bed management's operational needs. Medical metrics may or may not be available through COTS systems. Furthermore, the technology is unlikely to display well understandable graphical charts. Another disadvantage of COTS is that it may be necessary to use patchwork systems to manage follow-ups, referrals, and treatments. Finally, because they had not input over the system's design or development, users may not be thrilled with its interface or ease of use. |
| **Hospital Bed Status Tracking** | Users and owners will determine the system's requirements. The system's design and development will be guided by these needs. This means that the solution will perform far better within an organization than a COTS system. This also means that the organization will be happy and enthusiastic about the system. |

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| **Technical Feasibility** |
| **Commercial Off the Shelf (COTS)** | Although a COTS system is theoretically conceivable, it lacks key functionality. Furthermore, technical support would be provided as long as the vendor remained in business. There will be no technical support if the vendor goes out of business. |
| **Hospital Bed Status Tracking** | The development of the Hospital Bed Management system is technically viable because current technology will be used. Technical staff is also available to help create the Hospital Bed Management system using technology. Furthermore, the technology has been tried and tested and will be supported for many years. |

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| **Schedule Feasibility** |
| **Commercial Off the Shelf (COTS)** | Because no development is required, COTS systems can be implemented fast and easily. To maximize usability, the COTS system will need to be customized. |
| **Hospital Bed Status Tracking** | The Hospital Bed Management system will take more time and effort to design and develop than a standard off-the-shelf solution. The present period provided according to the master timetable is sufficient for designing and developing the system. |

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| **Economic Feasibility** |
| **Commercial Off the Shelf (COTS)** | Commercially available systems will cost less than designing a new system. However, it is crucial to keep in mind that the commercial system will not suit all user needs. Furthermore, if the system fails to execute the required functions, it will be rendered unusable, and the COTSs linked with it will be regarded sunk. |
| **Hospital Bed Status Tracking** | Developing a system will cost far more than purchasing one. The project's required funding is available. Not to mention that once operational, the system will produce revenue. The COTS associated with development, operation, and maintenance will be considerably outweighed by the money gained by employing the system. |

**5.2.2 Cost Benefit Analysis**

The following analysis is for the Hospital Bed Management system.

Table

Description automatically generated

Table

Description automatically generated

Table

Description automatically generated with medium confidence

Table

Description automatically generated with low confidence

|  |  |  |
| --- | --- | --- |
|  |  |  |
| **Hospital Bed Management System** | | |
| **Statement of Profit and Loss** | | |
| **Years 0 to 6** | | |
| Revenue |  |  |
|  | **6 Years Projected Revenue** |  |
|  | Patient Service Revenue | $1,402,039 |
|  | Hospital Grant | $502,223 |
|  | Total Bed's Grant | $523,149 |
|  | Government Grant | $432,470 |
|  | Private Doctors | $216,235 |
|  | Fund Raiser | $125,556 |
|  | **Total Revenue** | **$3,201,671** |
|  |  |  |
| Cost |  |  |
|  | **Development Cost** |  |
|  | Total Personnel Cost | $309,040 |
|  | Total Equipment Cost | $13,000 |
|  |  |  |
|  | **6 Years Projected Operating Cost** |  |
|  | System Maintenance | $99,495 |
|  | Cyber Security Consultant | $33,165 |
|  | Health Insurance Consultant | $9,949 |
|  | Miscellaneous | $17,007 |
|  | Doctor | $935,250 |
|  | Bed Management Staff | $1,140,872 |
|  | **Total Cost** | **$2,136,243** |
|  |  |  |
|  |  |  |
| Profit/(Loss) | **Total Revenue - Total Cost** | **$1,065,428** |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Payback Analysis** | | | | | | | |
| **Cash Flow Description** | **Year 0** | **Year 1** | **Year 2** | **Year 3** | **Year 4** | **Year 5** | **Year 6** |
| **Development Cost** | $322,040 |  |  |  |  |  |  |
| **Operation & Maintenance Cost** |  | $337,064 | $350,547 | $371,579.35 | $393,874.11 | $417,506.56 | $442,556.96 |
| **Discount Factors for 11%** | 1.0000 | 0.9009 | 0.8116 | 0.7312 | 0.6587 | 0.5935 | 0.5346 |
| **Time Adjusted Cost (Adjusted to Present Value)** | $322,040 | $303,661 | $284,504 | $271,699 | $259,445 | $247,790 | $236,591 |
| **Cumulative Time-Adjusted Costs Cover** | **$322,040** | **$625,701** | **$910,205** | **$1,181,903** | **$1,441,348** | **$1,689,138** | **$1,925,729** |

**5.2.2.1 Chart cost analysis of design**

**5.2.2.2 Chart cost analysis of hardware, software, miscellanies purchases**

**5.2.2.3 Chart cost analysis of system operation, and maintenance**

**5.3 Compare Candidate Solutions**

*Candidate Solution Matrix*

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| --- | --- | --- |
| **Characteristic** | **Patient Education Status Tracking (PEST)** | **Commercial Off the Shelf (COTS)**  **MobileMD** |
| **Operating environment or constraints** | * Windows 10, Windows 8+, Windows 7+ * Mac OS 10.11 +(El Capitan), 10.10 +(Yosemite) and 10.9 +(Mavericks) | * Microsoft Windows XP or later * Windows Compatible Web Browser with current updates/patches |
| **Hardware new and existing** | Windows   * 2+ GHz processor. * 8+ GB RAM. * 500 MB of available hard-disk space * SQL Database Server   Mac   * 2.1+ GHz Intel™ processor. * 8 GB RAM. * 500 MB of available hard-disk space. | * Desktop or notebook computer running Windows 7, Vista, XP/2000 * Pentium III or higher CPU or equivalent * Display adapter resolution 1024 x 768 - Recommended 1280 x 1024 or higher * Monitor size - 17” or larger recommended |
| **Software new and existing** | Windows   * Microsoft® Internet Explorer 9.0 or higher * Microsoft .NET Framework 4.0 * Visual Studio 2013 * SQL Server   Mac   * QuickTime 5.0 and web browser for multimedia tutorials. * Safari.   Adobe   * Adobe Acrobat Reader Version 10 | * Internet Explorer - version 7.0 minimum; up to version 9.0 with 128-bit encryption * Firefox - version 25.0 or higher with SSL 3.0 encryption * Chrome - version 30.0 or higher with SSL 3.0 encryption * Safari – MS Windows compatible version only (e.g. version 5.1.7) * Adobe Acrobat Reader - required to view, print or save PDF files |
| **Staffing new and existing** | * Database Specialist | * Web administrator |
| **Training new and existing** | * Tutorials * Intuitive GUIs * Embedded Help function | * No training required |
| **Installation requirements** | * Microsoft Windows Installer 3.0 | * Windows Compatible Web Browser with current updates/patches installed * Java Version 8 to view * scanned image files |
| **Performance requirements** | * Data storage backup and recovery < 30 minutes * 98% of all response time < 2 seconds | * 95% of all response time should be less than 8.5 second |
| **Development requirements** | * Client-Server model * SQL Database | * Web based data driven development |
| **Reports to be delivered** | * Metadata view to enable analysis and reporting across disparate sources. | * SQL Server 2005, Enterprise Edition, SP2 |
| **Security requirements** | * Access intranet information through the Internet * SSL secure authorization | * SSL Secure login |
| **Auditing requirements** | * Audit trails from access logs * Code review | * Periodic system audits |

**5.4 Recommended Final Best Solution**

|  |  |  |
| --- | --- | --- |
| **Criteria** | **New (Recommended)** | **Existing** |
| **Operating Environment or Constraints** | * Data connection is necessary for interactive chart reporting. * Off-line solution available for viewing stored database data. | * Data connectivity required for all functionalities. |
| **Hardware new and existing** | Windows   * 2+ GHz processor. * 8+ GB RAM. * 500 MB of available hard-disk space * SQL Database Server   Mac   * 2.1+ GHz Intel™ processor. * 8 GB RAM. * 500 MB of available hard-disk space. | * Desktop or notebook computer running Windows 7, Vista, XP/2000 * Pentium III or higher CPU or equivalent * Display adapter resolution 1024 x 768 - Recommended 1280 x 1024 or higher * Monitor size - 17” or larger recommended |
| **Software new and existing** | * In-House development * Best-fit tailored to company requirements * Control over software improvements * All of the required features implemented * Sustains core competencies and will adhere to a higher level quality service | * No control over software improvements * Company needs are not directly met in one package solution |
| **Staffing new and existing** | * IT personnel minimal | * Web administrator |
| **Training new and existing** | * 1 hour tutorial to introduce healthcare workers to the functions and capabilities | * User manual |
| **Installation requirements** | * Microsoft Windows Installer 3.0 | * Windows Compatible Web Browser with current updates/patches installed * Java Version 10 to view scanned image files |
| **Performance requirements** | * 98% Pages loaded within 2 seconds of request | * 95% of all response time should be less than 8.5 second |
| **Development requirements** | * Client-Server model * SQL Database | * Web based data driven model |
| **Reports to be delivered** | * Reports may request included patients medical progress depicted in a line graph * Average patient to total all active patient | * SQL Server 2005, Enterprise Edition, SP2 |
| **Security requirements** | * Access intranet information through the Internet * SSL secure authorization | * SSL Secure login |
| **Auditing requirements** | * Login and access log trails | * Periodic review |