#### Risk Identification Checklist

##### Product Size Risks

* **Estimated size in lines of code (LOC)**

Home Entertainment System will have an estimated 3540 lines of code.

* **Degree of confidence in estimated size**

The size of the project is large as compared to the staff available.

* **Estimated size in number of programs, files, and transactions**

1. We estimate 4 programs.
2. We estimate 30 large files for recommendation engine and ratings, Unlimited files for the video contents.
3. We estimate 40 or more transactions for the engine, and 20 transactions for the user-interface.

* **Percentage deviation in size from average for previous products**

We allow for a 10% deviation from average.

* **Size of database created or used**

The size of the database is extremely large as there is a lot of video content available from various sources.

* **Number of users**

The number of users is very large as many people will try to watch different videos at the same time. The number of users can increase even further is there is some special content available (exclusive).

* **Number of projected changes to the requirements**

Since the company is, the project creator and owner the scope of changes fairly low.

* **Reuse of software**

Since it is the first project of the company the reuse of software is limited to external apis.

#### Business Impact Risks

* **Effect on company revenue**

As this is the only project of the company, its success is effects the company’s survival. The number of subscribers will affect the revenue directly. So a low number of subscribers will affect the revenue.

* **Visibility of product to senior management**

The project is approved by senior management including the investors.

* **Reasonableness of delivery deadline**

Fairly reasonable Deadline. But may be affected if size of product change.

* **Number of customers and the consistency of their needs**

The number of customers should be fairly high as it will affect the revenue directly. If the subscribers are below average the survival of the company may be effected.

* **Sophistication of end users**

Low sophistication of users is required as the system will be extremely user friendly as it’s an entertainment platform..

* **Amount and quality of documentation that must be produced and delivered to customer**

The documentation is minimum.

* **Governmental constraints in the construction of the product**

There may be some R-rated content, or some content inappropriate according to the culture of the country and hence the certification of the content from the government is essential.

* **Costs associated with late delivery**

Delivery time is not very important as the product is made by the company itself .

* **Costs associated with a defective product**

Unknown at this time.

#### Customer Related Risks

* **Have you worked with the customer in the past?**

The product is built for the same company.

* **Does the customer have a solid idea of what is required?**

The requirements are identified clearly.

* **Is the customer willing to establish rapid communication links with the developer?**

Already present,.

* **Is the customer willing to participate in reviews?**

Yes.

**Process Risks**

* **Does senior management support a written policy statement that emphasizes the importance of a standard process for software development?**

Yes , The management knows the importance of a standard process for software development.

* **Has your organization developed a written description of the software process to be used on this project?**

Yes. Home entertainment is under development using the structured method as described in part three of Roger S. Pressman’s Software Engineering, A Practitioner’s Approach.

* **Are staff members willing to use the software process?**

Yes. The software process was agreed upon before development work began.

* **Is the software process used for other products?**

N/A. PA Software has no other projects currently.

* **Has your organization developed or acquired a series of software engineering training courses for managers and technical staff?**

Yes. All members of the design team have attended CIS 375, Introduction to Software Engineering at the University of Michigan – Dearborn.

* **Have documented outlines and examples been developed for all deliverables defined as part of the software process?**

Yes. The course instructor has supplied outlines for all deliverables.

* **Are formal technical reviews of the requirements specification design and code conducted regularly?**

No. Although informal reviews are conducted.

* **Are formal technical reviews of test procedures and test cases conducted regularly?**

No. Although informal reviews are conducted.

* **Are the results of each formal technical review documented, including errors found and resources used?**

N/A. As formal technical reviews have not been conducted, they cannot be documented.

* **Is there some mechanism for ensuring that work conducted on a project conforms with software engineering standards?**

No. There has been no planned method to ensure software-engineering standards will be met.

* **Is configuration management used to maintain consistency among system/software requirements, design, code and test cases?**

Yes. The accompanying Software Configuration Management document outlines the plan for maintaining consistency among all technical documents in the Home Entertainment System Company.

* **Is a mechanism used for controlling changes to customer requirements that impact software?**

No. The requirements are fairly well defined and changes may not be very large.

* **Is there a documented statement of work, a software requirements specification, and a software development plan for each subcontract?**

N/A. All work is done by a single development team. No subcontracting will take place on the project.

### **Technical Issues**

* **Are facilitated application specification techniques used to aid in communication between the customer and the developer?**

The development team will hold frequent meetings directly with the customer. No formal meetings are held (all informal). During these meetings the software is discussed and notes are taken for future review.

* **Are specific methods used for software analysis?**

Not very specific checks are present, but overall checks and reviews along with major components is conducted.

* **Do you use a specific method for data and architectural design?**

Data and architectural design will be mostly object oriented. This allows for a higher degree data encapsulation and modularity of code.

* **Is more than 90 percent of your code written in a high-order language?**

Yes. Code will be written in a combination of C++,Python and SQL.

* **Are specific conventions for code documentation defined and used?**

No. Specific conventions have not been established, but all design members have agreed to comment code as completely as possible.

* **Do you use specific methods for test case design?**

Yes. Test will be conducted on streaming speeds as compared to other rival companies along with recommendation engine evaluation.

* **Are software tools used to support planning and tracking activities?**

No. No software tools are to be used. Due to the existing deadline, the development team felt it would be more productive to begin implementing the project than trying to learn new software tools. After the completion of the project software tools may be implemented for future projects.

* **Are configuration management software tools used to control and track change activity throughout the software process?**

No. No software tools are to be used. Due to the existing deadline, the development team felt it would be more productive to begin implementing the project than trying to learn new software tools. After the completion of the project software tools may be implemented for future projects.

* **Are software tools used to support the software analysis and design process?**

No. No software tools are to be used. Due to the existing deadline, the development team felt it would be more productive to begin implementing the project than trying to learn new software tools. After the completion of the project software tools may be implemented for future projects.

* **Are tools used to create software prototypes?**

Yes. Prototypes are created using proper programming and implementation of the feature in python.

* **Are software tools used to support the testing process?**

No. No software tools are to be used..

* **Are software tools used to support the production and managing of documentation?**

Yes. Microsoft Word will be used to support the production and management of all technical documentation.

* **Are quality metrics collected for all software projects?**

No. No plans have been made to collect quality metrics at this time.

* **Are productivity metrics collected for all software projects?**

No. No plans have been made to collect productivity metrics at this time.

##### Technology Risks

* **Is the technology to be built new to your organization?**

Yes the technology is new for the Recommendation engine as a neural network is to be used for it which has not been implemented by the company before .

* **Do the customer’s requirements demand the creation of new algorithms or input or output technology?**

Yes the recommendation engine is a new algorithm which needs to be developed .

* **Does the software interface with new or unproven hardware?**

The software is browser based and may not need any other hardware for it to run.

* **Does the software to be built interface with vendor supplied software products that are unproven?**

No, NOT applicable.

* **Does the software to be built interface with a database system whose function and performance have not been proven in this application area?**

No. Database is an essential part of the system and all data is stored locally.

* **Is a specialized user interface demanded by the product requirements?**

Yes. The interface is completely specialized. It’s not based on any other software already built.

* **Do requirements for the product demand the creation of program components that are unlike any previously developed by your organization?**

No, It is the first project by our organization.

* **Do requirements demand the use of new analysis, design, or testing methods?**

No. The development team will implement existing analysis, design, and testing methods for the project.

* **Do requirements demand the use of unconventional software development methods?**

No. Home Entertainment System uses C++ code in header files, which is not unconventional. It also integrates with Python and SQL, which is not unconventional.

* **Do requirements put excessive performance constraints on the product?**

Yes, Since the Video streaming puts a lot of load on the computer system there are some performance constraints.

* **Is the customer uncertain that the functionality required is “doable”?**

No. The customer has full confidence in the project as described in the System Specification Document and the Software Specification Document.

**Development Environment Risks**

* **Is a software project management tool available?**

No. No software tools are to be used. Due to the existing deadline, the development team felt it would be more productive to begin implementing the project than trying to learn new software tools. After the completion of the project software tools may be implemented for future projects.

* **Are tools for analysis and design available?**

No. No software tools are to be used. Due to the existing deadline, the development team felt it would be more productive to begin implementing the project than trying to learn new software tools. After the completion of the project software tools may be implemented for future projects.

* **Do analysis and design tools deliver methods that are appropriate for the product to be built?**

N/A. No analysis or design tools are to be used.

* **Are compilers or code generators available and appropriate for the product to be built?**

Yes. IDE like Sublime Text, Pycharm etc are available for development of Home Entertainment System along with Django framework.

* **Are testing tools available and appropriate for the product to be built?**

No. No software tools are to be used. Due to the existing deadline, the development team felt it would be more productive to begin implementing the project than trying to learn new software tools. After the completion of the project software tools may be implemented for future projects.

* **Are software configuration management tools available?**

No. No software tools are to be used. Due to the existing deadline, the development team felt it would be more productive to begin implementing the project than trying to learn new software tools. After the completion of the project software tools may be implemented for future projects.

* **Does the environment make use of database or a repository?**

Yes. Django uses SQL database or sqlite3 database for storage and can be accessed through the Django framework.

* **Are software tools integrated with one another?**

Yes, Django and the SQL database are integrated with one another.

* **Have members of the project team received training in each of the tools?**

Yes. The team members have received adequate training for Django framework which is needed for the development of the System.

* **Are local experts available to answer questions about the tools?**

No. Local experts are not available.

* **Is on-line help and documentation for the tools adequate?**

Yes. Online documentation is available for Django.

**Staff Size and Experience Risks**

* **Are the best people available?**

No, But the team members are capable of creating the System of required quality.

* **Do the people have the right combination of skills?**

Yes. The team members have experience in C++, Python, SQL, Microsoft Access, and software development skills.

* **Are enough people available?**

Yes. Though the team is small, a larger team could take away from the productivity due to increased lines of communication.

* **Are staff committed for entire duration of the project?**

Yes. Any staff member are completely dedicated to developing the required system.

* **Will some project staff be working only part time on this project?**

No. All staff members will be working on the project for the entire duration of the project.

* **Does staff have the right expectations about the job at hand?**

Yes. All team members understand what is required to complete the project, and are committed to accomplishing them.

* **Has staff received necessary training?**

Yes. Team members are familiar with C++, Python, SQL and software engineering techniques.

* **Will turnover among staff be low enough to allow continuity?**

Yes. Due to the nature of the staff, there will be no staff turnover.

Risk Table

|  |  |  |  |
| --- | --- | --- | --- |
| **Risk** | **Category** | **Probability** | **Impact** |
| Large product size compared to staff | PS | 50 | 2 (Critical) |
| Data Loss | PS | 20 | 3 (Critical) |
| Scalability | PS | 50 | 2 (Critical) |
| Revenue (Only Product of the Company) | BI | 20 | 2 (Critical) |
| Number of subscribers (Part of revenue) | BI | 20 | 2 (Critical) |
| Government constraints on R-Rated media | BI | 40 | 2 (Marginal) |
| Unplayable content | BI | 20 | 1 (Marginal) |
| SQA | PM | 30 | 2 (Critical) |
| New technology (Neural Network) | TR | 40 | 2 (Marginal) |
| Streaming Speed | TR | 30 | 3 (Critical) |

**Impact Values:**

**1 – Catastrophic**

**2 – Critical**

**3 – Marginal**

**4 – Negligible**

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| --- | --- | --- | --- |
| **Risk Information Sheet** | | | |
| **RISK ID: 3** | **Date: 15/02/2018** | **Prob: 50%** | **Impact: Critical** |
| **Description:**  Since the software is highly user oriented, if the number of users increases above a certain threshold, the system may not be able to handle the load and crash | | | |
| **Refinement/Context:**  Sub condition 1 - The estimated number of users was not accurately defined  Sub condition 2 - Lower amounts of liquid assets in the nascent stages of the company resulted in insufficient hardware components for large scale use.  Sub condition 3 - The database storage company which was hired for storing the video content was not able to handle the scale of the product once growth occurred. | | | |
| **Mitigation/monitoring:**  - Code refactoring to be done in order to obtain performance gains and produce an easily scalable code base  - Hardware used should be able to handle 80% excess of average traffic  - Communicate and create a contract with the database company to obtain a more scalable plan that can handle large spikes in user population. | | | |
| **Management/contingency/trigger:**  - The R.E. is computed to be INR 8,50,000. This cost is to be allocated with the contingency cost to develop a more scalable software and purchasing better hardware to support a larger number of users. | | | |
| **Current Status:**  10/01/2018: Mitigation steps initiated | | | |
| **Originator:** | | **Assigned:** | |

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| --- | --- | --- | --- |
| **Risk Information Sheet** | | | |
| **RISK ID: 4** | **Date: 15/02/2018** | **Prob: 40%** | **Impact: Marginal** |
| **Description:**  Certain movies and shows contain scenes that require the viewing audience to be of a certain age(18 years). Such content is rated ‘R’ and the availability of such content could attract attention from the Government. Also, there will have to be provisions to ensure that only users above the age limit have access to such content. | | | |
| **Refinement/Context:**  Sub condition 1 - Censor Board opposing the content.  Sub condition 2 - The government might push for regulation of ‘R’ rated content | | | |
| **Mitigation/monitoring:**   * All content available on the system will be approved by the Censor Board first to avoid affecting any sect or portion of the Indian community. * Registration with Aadhar Card for age verification to ensure that users get age appropriate content. | | | |
| **Management/contingency/trigger:**   * RE computed to ₹500,000 * All series and movies will be produced within the limit approved by the censor board. * Trigger: Mitigation steps unproductive as of 24/02/18 | | | |
| **Current Status:**  15/02/18 Mitigation steps initiated | | | |
| **Originator:** | | **Assigned:** | |

|  |  |  |  |
| --- | --- | --- | --- |
| **Risk Information Sheet** | | | |
| **RISK ID: 88** | **Date: 15/02/2018** | **Prob: 40%** | **Impact: Catastrophic** |
| **Description:**  The recommendation system requires a custom built neural network in order to provide state of the art results. The quality of this new technology has a critical impact on the value of the product | | | |
| **Refinement/Context:**  Sub condition 1 - The neural network will require a large amount of data for training before providing acceptable results  Sub condition 2 - Performance of the neural network (speed of predictions) may not be acceptable, resulting in a lower quality of service  Sub condition 3 - Current hardware is not capable of hosting a large scale neural network, which might lead to crashes if number of concurrent users spike unexpectedly. | | | |
| **Mitigation/monitoring:**  - Initially the product will be offered as a limited invite-only alpha for a three months, without a neural network based recommendation system in order to build a dataset for the neural network  - Hire an expert in C++ optimization in order to find performance gains for the neural network  - Shift neural network based services to a scalable cloud architecture in order to handle traffic | | | |
| **Management/contingency/trigger:**  The R.E. is computed to be INR 10,00,000. The fund will be required for migration to a cloud architecture and neural network experts. In case of failure to build an in house solution, the construction of the network will be outsourced  Trigger: Mitigation steps unproductive as of 24/05/2018 | | | |
| **Current Status:**  10/01/2018: Mitigation steps initiated | | | |
| **Originator:** | | **Assigned:** | |