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**BATCH:** A

**TE-IT**

**Risk Management, Monitoring and Mitigation Plan**

**Human Digital Twins**

**Aim :** Build a risk management, mitigation and monitoring plan for the risks identified and also find their risk score and create the risk information sheet.

#### **Risk analysis and management** are actions that help a software team to understand and manage uncertainty. Many problems can affect a software project. Risk is considered as a probability that some adverse circumstances will actually occur. Software is a difficult undertaking and is also a key to good software project management. Risk analysis is done by everyone who is involved in the process of the project. Risks can be categorized as: » Financial Risk » Health Risk » Security Risk » Environmental Risk Finally, a plan is developed to manage those risks that have high probability and high impact. Risk management involves several stages, they are:

#### **Risk identification** refers to the process of identifying dangerous or hazardous situations and trying to characterize it. It is a procedure to analyze, review and anticipate possible risks. There are many types of risk identification which helps in the project.

#### **Risk impact-**

#### Impacts are often defined as the consequences, or effects of a risk event on the project objectives. These impacts can be both beneficial or harmful to the objectives. The impact of risk events on different project objectives can be defined in both a qualitative and quantitative manner. These project objectives are cost, schedule, quality, scope, health, safety, etc.

#### **Risk Probability-**

#### Risk probability, or likelihood, is the possibility of a risk event occurring. The likelihood can be expressed in both a qualitative and quantitative manner. When discussing probability in a qualitative manner, terms such as frequent, possible, rare, etc. are used. It is also possible to describe the probability in a numerical manner. This can be done using scores, percentages, and frequencies defined by the organizations dependent on the relative description.

#### **Risk classification-**

#### 1. **Product size (PS)** - risks associated with the overall size of the software to be built or modified.

#### 2. **Business impact (BU)** - risks associated with constraints imposed by management or the marketplace.

#### 3. **Stakeholder characteristics (SC)** - risks associated with the constraints of the customer and the developer’s ability to communicate with the customer in a timely manner.

#### 4. **Process definition (PD)** - risks associated with the degree to which the software process has been defined and is followed by the development organization.

#### 5. **Development environment** **(DE)** - risks associated with the availability and quality of the tools to be used to build the product.

#### 6. **Technology to be built** **(TE)** - risks associated with the complexity of the system to be built and the "newness" of the technology that is packaged by the system.

#### 7. **Staff size and experience (ST)** - risks associated with the overall technical and project experience of the software engineers who do the work.

#### 8. **Project risk**

#### a. If the project risk is real then it is probable that the project schedule will slip and the cost of the project will increase.

#### b. It identifies the potential schedule, resource, stakeholders and the requirements problems and their impact on a software project.

#### 9. **Technical risk**

#### a. If the technical risk is real then the implementation becomes impossible.

#### b. It identifies potential design, interface, verification and maintenance of the problem.

#### 

**Risk Identification and Classification :**

| **Sr** | **Risks** | **Project** | **Technical** | **Business** |
| --- | --- | --- | --- | --- |
| 1 | **Customer will change requirements**  New features could be requested during development, leading to schedule and cost slippage. | yes | yes |  |
| **2** | **Scalability Risk :**  The inability to scale up the services according to the demand will lead to unsatisfied customers. | yes | yes |  |
| **3** | **Delay in Server Equipment :**Due to a manufacturer’s production backlog, the servers are not available for large scale application testing causing a delay in the project schedule. | yes | yes |  |
| **4** | **Retention of potential customers :**  The risk related to the ability of the marketing team to retain the potential customers. | yes |  | yes |
| **5** | **Volume / Demand Risk :** The risk that the actual market’s demand for the product or service will not yield the projected sales volumes. | yes |  | yes |
| **6** | **Maintenance Risk :** The risk that maintaining the software will cost more than anticipated | yes | yes |  |
| **7** | **Technology fails to meet expectations:** The technology might underperform, leading to worse than anticipated performance |  | yes | yes |
| **8** | **Customers resist system:** Since our system is a new way of using and integrating customer’s fitness and social media accounts, customers may not adapt to it | yes |  |  |
| **9** | **API failure:** The risk that if the url/ data of the public database is altered, incorrect/incomplete information may be visible to the customers. | yes | yes |  |
| **10** | **Client Privacy Issue :** The risk that if the sensitive information of the customer like his/her account, device details gets leaked may lead to security breach. | yes | yes |  |
| **11** | **Funding will be Insufficient :** The risk that funding will not be available at a level or timing required for the company , startup to succeed. | yes |  |  |

**Risk Projection :**

| **Risk ID** | **RISKS** | **CATEGORY** | **PROBABILITY** | **IMPACT** | **RISK SCORE** |
| --- | --- | --- | --- | --- | --- |
| 1 | Customer will change requirements | PS | 35% | 1 | 0.35 |
| 2 | Scalability Risk | PS | 80% | 2 | 1.60 |
| 3 | Delay in server equipment | DE | 10% | 2 | 0.20 |
| 4 | Retention of potential customers | BU | 25% | 2 | 0.50 |
| 5 | Volume/ Demand risk | BU | 35% | 2 | 0.70 |
| 6 | Maintenance Risk | ST | 55% | 3 | 1.65 |
| 7 | Technology fails to meet expectations | TE | 30% | 2 | 0.60 |
| 8 | Customers resist system | PS | 45% | 3 | 1.50 |
| 9 | API failure | TE | 70% | 1 | 0.70 |
| 10 | Client Privacy Issue | DE | 45% | 2 | 0.90 |
| 11 | Funding will be insufficient | CU | 50% | 1 | 0.50 |

**Impact values**

1 - Catastrophic

2 - Critical

3 - Marginal

**Sorting Risk Projection Table on the basis of probability and cutoff line is drawn:**

| **Risk ID** | **RISKS** | **CATEGORY** | **PROBABILITY** | **IMPACT** |
| --- | --- | --- | --- | --- |
| 2 | Scalability Risk | PS | 80% | 2 |
| 9 | API failure | TE | 70% | 1 |
| 6 | Maintenance Risk | ST | 55% | 3 |
| 11 | Funding will be insufficient | CU | 50% | 1 |
| 10 | Client Privacy Issue | DE | 45% | 2 |
| 8 | Customers resist system | PS | 45% | 3 |
| 1 | Customer will change requirements | PS | 35% | 1 |
| 5 | Volume/ Demand risk | BU | 35% | 2 |
| 7 | Technology fails to meet expectations | TE | 30% | 2 |
| 4 | Retention of potential customers | BU | 25% | 2 |
| 3 | Delay in server equipment | DE | 10% | 2 |

**The risks below the highlighted line will not have a RMMM plan.**

**Risk Information Sheet:**

| **Risk Id:** 2 | **Probability:** 80% | **Impact:** 2 |
| --- | --- | --- |
| **Description:** Scalability Risk **-**The inability to scale up the services according to the demand will lead to unsatisfied customers. | | |
| **Context:** The project will have to be more scalable than it is to handle the scenario to minimize the failure of transactions. | | |
| **Mitigation**  Try to use a server large enough to accommodate all users.The tech stack used should be upgraded and also the server will have to be distributed to handle the load of users and to give a smooth service.  **Monitoring**  The number of active users should be monitored.  **Management**  If it is found that the number of active users has increased, then more servers can be deployed. They can be properly configured. So that at the time of failure if a server fails traffic could be directed to another server. There will have to be steps taken to increase the scalability of the system by using multithreading and many other methods to increase the scalability. | | |
| **Originator :** End Users | | **Assigned :** Mansi Dwivedi |

| **Risk Id:** 9 | **Probability:** 70% | **Impact:** 1 |
| --- | --- | --- |
| **Description:** API failure -The risk that if the url/ data of the public database is altered, incorrect/incomplete information may be visible to the customers. | | |
| **Context:** There can be an API failure from the server side. Due to which the application gets affected because of the extensive use of APIs to fetch customers fitness data as well as data that has to be accessed from the user’s personal accounts. | | |
| **Mitigation**  Use third party APIs that are reliable and have good technical support.  **Monitoring**  All the APIs integrated with the app should be regularly monitored and a count should be maintained on the number of times the API fails.  **Management**  If the fitness APIs or the other user’s personal account related API is down, the users can be provided with the backup data till the APIs start again. Also inform the developers about this and seek technical support from them. | | |
| **Originator :** Human Digital Twins Server | | **Assigned :** Mansi Dwivedi |

| **Risk Id:** 6 | **Probability:** 55% | **Impact:** 3 |
| --- | --- | --- |
| **Description:** Maintenance Risk - The risk that maintaining the software will cost more than anticipated | | |
| **Context:** The external services (eg. APIs) used or technology stack may be deprecated and replaced with a paid version and the code needs to be updated for the software to function efficiently. | | |
| **Mitigation**  The maintenance plan will have to be reformulated according to the resources at hand.  **Monitoring**  A regular check should be kept on the ongoing maintenance and allocated schedule and budget to minimize the risk.  **Management**  The maintenance type and frequency are prioritized based on the risk of failure. Assets that have a greater risk and consequence of failure are maintained and monitored more frequently. Assets that carry a lower risk are subjected to less stringent maintenance programs. Implementing a risk-based maintenance process means that the total risk of failure is minimized across the facility in the most economical way. | | |
| **Originator :** Human Digital Twins Server | | **Assigned :** Dishita Ashar |

| **Risk Id:** 11 | **Probability:** 50% | **Impact:** 1 |
| --- | --- | --- |
| **Description:** Funding will be insufficient - The risk that funding will not be available at a level or timing required for the company, startup to succeed. | | |
| **Context:** Considering that there has been a financial crisis or an overall recession causing the market share to fall thereby leading to low funding. | | |
| **Mitigation**  Implement actions to minimize the impact.  **Monitoring**  Allocate a fixed budget to each module and review it in a timely fashion to adjust any additional costs incurred.  **Management**  Improved costing by prioritizing the modules that may lead to a product that may be best suitable considering the financial situation. | | |
| **Originator :** Venture Capital | | **Assigned :** Dishita Ashar |

**CONCLUSION :** There are several risks associated with the ‘Human Digital Twin’ Software as the project is to be used by a lot of people and the scalability of the project is high, so there should be mitigation. We will keep scalability as our foremost priority and ensure that no transaction fails and the user gets seamless service.