Project Plan: Arithmetic Animator
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1. ## *Introduction:*

    This document briefs about the Project Plan which is to followed by Team 38 for the project named "Arithmetic Animator" under Dr.Suresh Purini and Dr. Sudhakar P. This team consists of four students at International Institute of Information Technology, Hyderabad.

    The intended readers of this document are current and future developers working on Arithmetic Animator and the sponsors of the project. The plan will include, but is not restricted to, a summary of the system functionality, the scope of the project from the perspective of the team, scheduling and delivery estimates, project risks and how those risks will be mitigated, the process by which the team will develop the project, and metrics and measurements that will be recorded throughout the project.

2. ## *Overview:*

    There is a fear that exists in the minds of young, creative kids regarding Mathematics. Fear being that they have to mug-up multiplication tables. If while doing a simple calculation for eg. 7 x 8 a kid forgets the result, he/she will be left clueless. Our aim is to build an interactive app which will treat Mathematics as simple magic and will enable them to do complicated calculations easily. The method used to do such "simple magic" will be one described in Vedic Mathematics. It will illustrated using tables and animations which will induce interest in the young students. Dr. Sudhakar Puttagutta has described us the method which involves converting participating digits into nearest tens.

    For eg. 7 x 8 will be represented as 7 x 8 table with 7 rows and 8 tables. Each cell will contain an object which preferably will has some animation. Then, 2 bottom rows will be transposed and joined next to the 8 columns. It will result in 10 columns and 5 rows of 10 filled cells. Further, there will be 6 more filled cells. Thus, simplifying the calculation into 56. A kid will have to first select the matrix and then select the object. Then, he has to fill the selected objects into the selected matrix and transpose into nearest tens. Good animations and illustrations need to present to continuously grasp the attention of a young kid in the same manner a video game does.

2.1 Customers

As described above in the overview, the end product is mainly intended to remove the fear of mathematics from young kids aged between 5-10 years of age, they form the larger part of the end users. The other end users also include teachers and elders who wish to teach them.

2.2 Functionality

- Functionality to choose between Multiplication and Division - The user has the option to learn multiplication or division in an effective way.
- The application will provide a functionality to choose between an illustration or an exercise both for multiplication or division.
- In Illustration the end-user will be given an demonstration on how to perform the calculation correctly - The Illustration has a number of steps: Formation of the grid to be populated with animated objects, Transposing the rows to the columns or the columns to the rows(whichever is more efficient), Highlighting the filled block of 10*n, Computing the answer.
- In Exercise, the end-user will be given the functionality to choose between the set of exercises to be worked upon.
- For each exercise, the end-user will have the option of choosing the object(s) to be populated in the grid corresponding to the exercise.
- These objects chosen will be done from a library of objects, mainly composed of animated images of various animals, birds, etc.
- To perform the calculation, the user has to transform a row into column or vice-versa such that we can obtain certain number of rows/columns having number of objects equal to nearest 10, 15 or 20.
- To transform the objects from each row to column or vice-versa, the user has an option to pick up a full row, or a full column or pick up objects one by one from the grid.
- The application should be provided with an 'undo' option at each and every state.
- The application provides a very user-friendly and interactive procedure for performing arithmetic operations, depicted by a well-framed story.

2.3 Platform

As the sponsor wants the application to have maximum reach, the team has decided to make the application to a be web based app initially. If time permits we will also develop an android and iOS version of app.

2.4 Development Responsibility
The *Team 38* will be responsible for implementing the functionality that they commit to in Section 3 of this document.

3 Goals and Scope:
The main goal of the project is to create interest and make the child learn multiplications with fun.
- The application developed in the project should have maximum reach and should be easily understood by anyone.
- The user will be provided with two options
  ### Illustration:
  Here the user is clearly taught how to multiply two numbers easily. First he may have to choose with what objects he wants the grid to be filled. The entire process of multiplication is illustrated here. If an illustration is for 7*8, then 7 rows and 8 columns are filled or vice-versa. Then last two rows are moved such that they fill the remaining columns and make 10 column rows. Thus user depicts that there are 5 tens and some change. The remaining 6 objects tell that change is 6. So answer is 56.
  ### Exercise:
  Here the user inputs two numbers. He then selects the objects to fill the grids. He then by himself fills the grids. Then he adjusts the rows to 10 and calculate the numbers of tens and from remaining objects he depicts the change. In the process of filling if he does any mistake then a warning appears and he has to undo his step.
- Thus user can easily do multiplications with interest and not forced to by-heart the tables of multiplication.
- Designing the story to be framed with the illustration and exercises is out of scope for this project.

4. Deliverables
- Initially the sponsor will be delivered an app which will demonstrate the process of multiplication.
- In the second iteration he will be delivered with both illustration and exercise option with basic functionalities.
- Additional features like division, more animation etc. will be added in both of the iterations and finally a full version of the product will be delivered in the second: iteration.

5 Risk Management

5.1 Risk Identification
i. A user might input a number for which there is no algorithm implemented.
ii. A few elements implemented in the web-app might malfunction in the iOS or Android app.
iii. The extent of the apps functionality might increase too much and defy its purpose. (scope creep) For eg: if we start teaching kids complex vedic maths.

5.2 Risk Mitigation
i. We will list the numbers on which calculation can be performed in a eye-pleasing manner.
ii. We will continuously make the Android and iOS versions of the web-app.
iii. We will try and keep our project sponsor as much involved as possible.

6 Scheduling and Estimates

Milestone	Description	Release Date	Release Iteration
M1	User Interface	September 30, 2012	R1
M2	Implement Animations	October 5, 2012	R1
M3	Integrate UI,Animations and Algorithm	October 14, 2012	R1

7 Technical Process
The technical process will involve creating the UI in Javascript and html5. The aesthetics will be implemented using CSS3. Then, on completion of implementation of every milestone, if time and resources permit iOS and Android versions will be implemented using PhoneGap. The animation will be using both Javascript and Html5 .Testing of the apps will be done by checking the function of each feature and then it would be evaluated by the project sponsor. The cycle will continue for each Milestone.