

MS – HCI PROJECT REPORT

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Title:

iBharatha - A Digital Portal into the world of the Mahabharatha

Problem Statement:

How often do we hear about long epics and narrative works and wish we could have an easier way to read them? How often do we wish for a way to understand a story better by delving into the details of seemingly simple episode? It is a problem for people across different cultures and countries to be fully aware of long epics and narrative works from other cultures. Even if people know of such works, they hardly have the time or the heart to read and understand their brilliance. This is because of the fact that all these works are available mainly in textual medium and it is difficult to allocate time to read an epic.

A major issue that has to be addressed when discussing the presentation of a very long literary work is the bringing together of the various design artifacts based on that work. For instance, the Mahabharatha has several books written and quite a few movies and series made based on it. In a digital representation of the epic, it is very important to use most if not all of the artifacts in the right manner. This project can provide a solution to present any such information in the form of an application.

This project also addresses another problem, which is not completely technical. There is a world of knowledge in the philosophical works of the past that have not been properly captured. One such work is the Mahabharatha, an ancient Indian epic. The Mahabharatha contains great philosophies and teachings that are worth learning. The Bhagavad Gita, which is quite popular as a lesson in morals, is a small section of the Bharatha and is a sample of what the rest of the book

contains. The teachings from this book are believed to have inspired the religions of Hinduism, Buddhism and even Christianity. It is considered a guide to life and many modern leaders and civil activists have used it to inspire their movements.

So, my Master's project, provides a solution in the form of a digital portal for the epic, a web application to allow even people who have lesser time, or find it tough to understand cross-cultural narrative works, to experience the vastness of knowledge and the brilliance of plot from the Mahabharatha.

Solution:

When the film Troy was made, it was watched by audiences across borders despite it being a historical story based in ancient Greece. People found it possible to relate to a culture that they were very unfamiliar with and were eager to experience the story because it was given to them via a medium they are most comfortable with. The digital medium, with its highly interactive visual and audio components allowed viewers like me from a completely different cultural background to understand, know and experience the story of love, hate and war from the annals of Greek history. The success of so many more attempts to portray episodes from narratives such as George Martin's "A song of Fire and Ice", Mario Puzo's "Godfather" etc. through the digital medium is what made me pick the same medium to explore the representation of long narrative works.

Today, mobile and tablet computers are a part of everyday life. People are ready to use it for even day-to-day activities. Mobile phones have already become substitute for remote controls for television, thanks to the internet. With the advent of internet-based set top boxes, it has now become possible to tap the TV as a workable interface to develop for and interact with. It is now possible to make a tablet talk to a television set and get work done. This kind of two-way communication can be exploited to allow users to control what they want to see or read or hear when they navigate through a long tale.

I have made use of the tablet form-factor and the TV form-factor as two interactive interfaces for users to interact with as they watch, hear or read the narrative in question. This idea of dual interface let me as a developer to tap the

internal functionalities of the devices to better the user experience and also engage the user in the story.

I have chosen Mahabharatha, an ancient Indian epic as the narrative work to be digitalized because it is the story of the greatest war known to have happened, based centuries before Christ and is a collection of extremely thought-provoking, emotional and intensely human episodes. It is several times longer than Iliad and Odyssey put together and the application built justifies the “epic” nature by allowing users to experience the Mahabharatha using a tablet and a television.

DETAILS OF THE PROJECT

The Narrative Work:

The Mahabharatha is probably the best narrative work to consider for a project that aims to allow navigation through epics. Besides being a gripping tale, the Bharatha has a nested story structure for every episode it contains and this gives a scope for unraveling back stories at any point.

The project demanded the selection of specific episodes from the book so as to give a proof of concept and test all the possible features an app of this purpose can have. The episode I picked for the project is the disrobing of the lead female, Draupadi, and the subsequent speeches.

This particular episode is the most important one because it laid roots for the enmity between the clans in the book to elevate to a whole new level and caused the Great War. In Indian culture, the Woman has always played a crucial role. In this book, Draupadi’s anger and humiliation leads her to promise revenge and her family agrees to protect her honor by killing the enemies in battle.

Also, this particular episode has descriptions of miraculous and godly activities which would provide for an engaging experience. The disrobing incident is often

compared to the disrobing of Phryne of Ancient Greece and has great historical value.

The Mahabharatha, since the first textual form, has had several versions written based on it and interestingly, has versions written from the point of view several key characters. These works give a great insight into what could be the minds of each of those characters and when all of this is put together in one medium to describe a single episode, the experience can be expected to engage the user further into the story.

This kind of seamless transition across versions would provide for an interesting analysis and allow users to choose which side of the story to believe and follow through the course of the book.

Previous Work & Proposed List of features:

There are a few design artifacts that use the iPad and the TV as a way of narration. One would be the work done in Georgia Tech's etv lab called "Reliving Last Night." It allowed for interaction with the story itself by means of an iPad application using which the user could decide what happens at crucial points and could potentially change the outcome of the scene and the story itself.

Another related work is the Interactive Timeline of key events in the lives of Love and Diane, also a project of the etv lab. The timeline was organized chronologically and thematically and was very good in highlighting key moments, showcasing the intersections in storylines of mother and daughter, and thereby providing a channeled way of understanding a particular situation and the back stories leading up to that point.

Features	Reliving Last Night	Ancient Voice	iBharatha
Dual Interface	Yes	No	Yes
Interaction -> Story	Yes	No	No
Different Points of View	No	No	Yes
Navigation through story	Yes	No	Yes
Episodic breakdown of Story	No	Yes	Yes

Understanding the users and user needs:

The target audience for this project covers a large user base spread across cultures. So a considerable amount of work has put into understanding each user's needs. I went about the process of understanding user requirements by interacting with people well aware of the narrative and the ones who know little about it and understood what features and functionalities they believe would make the project accomplish the purpose.

A couple of user personas was constructed based on the target user characteristics:

"Shakti, a 23 year old literature student has always enjoyed reading the story of Mahabharatha. She has read two versions of the Mahabharatha which were translated into English and has a desire to read another version. She owns an iPad and has already watched the TV show based on the epic."

“Laura, a 35 year old IT professional in America has read Homer’s Iliad and Odyssey and enjoyed it thoroughly. She is curious to read epics from other cultures but has not had a chance to learn of the Bharatha. She uses companion applications when she watches her favorite TV shows.”

The participants of the initial user study were chosen so that they fit these two personas. There were 11 users. Five of them were students who knew the story. Three of them were experts in the field from India and three were users of companion applications for TV shows.

The initial requirements gathering was done by creating a mock up of the system with the episode in question as the main content. The mock up consisted of a video sample for users to watch and give opinions on. This was followed by a questionnaire which questioned the users of features they would expect on the tablet application, which parts of the episode were confusing without proper back-stories, which characters needed more information to be understood etc.

Rough prototype:

A rough prototype was made for the purpose of the initial user testing with the following features:

- One episode of the Mahabharatha from one point of view.

- Navigation through the storyline based on time.

- Playing of multimedia content on the TV based on user demand.

User testing of rough prototype:

After the building of the prototype, users were made to test the prototype. Two types of user testing was done namely the laboratory testing and remote usability testing.

For the in-house testing, users were observed as they watched the episode interacting with the iPad prototype. In the case of the remote testing, a web version of the prototype was sent out and instructions were given to them on how to use the application.

Both sets of users were made to take a questionnaire following the user tests. Questions were along these lines:

Compare textual experience versus viewing it on this tool.

Was any feature out of place in this system? If so, what?

Rate on a scale of 1 -5the ease of navigation.

Rate on a scale of 1 -5 the ease of understanding the story.

Was the feature to switch perspectives, useful?

Did it explain the story better?

Rate on a scale of 1-5 the effectiveness of the dual display.

Results of the Initial User Study:

The user testing of the initial prototype yielded the following results.

- It is very hard to keep track of characters.
- It is better to use images of the actors for characters.
- Relationships are complicated.

All users agreed upon the need for a representation of the key characters in some form in the application. This gave rise to a design idea namely the family tree or the character map.

The next set of user results had to do with the TV synchronization feature of the application. There were divided opinions.

- Should be able to work with or without the TV.
- Which episode to use?
- Level of abstraction in the episode

There was also considerable discussion and interviewing on the question of an entry point to the application. Participants were asked to suggest whether the application should be used as companion app for the TV series or a reader application with the video content as an additional feature. The latter was chosen by most users.

The experts who were participants in the user study helped pick the two characters whose points of view could be used for this project.

Features of the application:

The user study up front helped generate a list of features and functionalities to have as part of the system.

A list features:

A library of all the eighteen books in one screen which users can browse through and have a quick overview of. This feature is aimed at helping users pick which book they want to read with a blurb. Once a book is selected, the users can proceed to read it and/or watch it on the television.

The navigation through the episode is probably the most important feature of the application. The navigation tool contains a stage area which has image and textual information from each story-beat. This particular narrative tool may or may not be synced with the television screen based on user's choice.

The navigation tool is made even more engaging with an option to choose between different points of view. At the top of the screen are three buttons which allow the user to switch between points of view. This feature is expected to allow the user to look at every scene/ story beat from the points of view of different characters.

The application also contains a character map/family tree. Every long narrative work has a potential to confuse readers with the abundance of characters and network of relationships. The family tree is an attempt to ease the user's burden of keeping track of the complex web of characters in the story.

Another important feature of the application is where users are allowed to view the journeys of each of the principal characters from birth to death through the course of the story. This feature shall highlight which part of the country they were present in at each point in their life by plotting them on a map of the then India and tracing their path until death. This feature shall not only allow viewers to watch animated text as it narrates the life story of a person but also ties the character heavily to the narrative and explains the Mahabharatha from his or her point of view.

Design Strategies Employed:

These are interactions and options the application allows:

Selection of a book

At the screen where the user selects a book, there is a scrollable interface that allows users to browse through the library of the eighteen books. After the selection of a book, the users can either “flick” the book towards the television to start up the television or “tap” to open an iPad-only application.

Character Selection:

The user is given a chance to choose between points of view as he or she navigates through the scene. This allows the user to look at the story from different angles and understand how each character was an effective contributor.

For the disrobing scene, looking at it from the perspective of an observer would give an unbiased picture whereas looking at it from the heroine’s angle would help the user empathize with her and understand what the situation was like from her point of view. Also, looking at the scene from the perspective of the villain who ordered the disrobing would give an insight into the grudges he holds and how he was forced to do it.

This “switching” is made possible through the three buttons at the top of the screen which allows the users to easily switch across versions.

Television – Tablet Dual Interface:

The television plays the video that the user has selected and as it plays, the iPad screen updates itself to that particular story beat in the stage area.

Since the iPad is the primary interface, the users will have control over the content that plays on TV. The user can sift through the different story beats in the episode on the iPad and it moves the episode to that particular scene on the TV.

The application makes navigation an engaging experience by syncing the story on both the iPad and the television.

Family Tree:

The Mahabharatha, being an epic, has a multitude of characters that could confuse a reader who is not using the system at a stretch to read the entire book. So, a character map has been used to indicate relationships and show how characters interact. The family tree contains all the key characters mapped out on a large screen. The user can tap on the different characters to learn more about the character.

The Map of Life:

The feature that allows users to trace the life of each of the characters is a simple text animation that plays out on the map of India – covering the spatial and temporal aspects of each character’s life journey.

Story board for the Navigator:

Neutral Version:

These are the beats in the actual episode and will be the content for the neutral version of the Mahabharatha.

The Game:

The Pandava brothers lose the game having staked themselves and their wife, Draupadi. To celebrate victory and insult his enemies, the Kaurava princes move to bring Draupadi to court.

The Arrival:

Draupadi is dragged into court despite her pleas.

The Negligence:

The elders in the court fail to protect the woman's honour and continue to ignore the situation despite her repeated request to help her.

The Taunt:

Duryodhan taunts Draupadi to sit on his lap thereby angering the Pandava brothers too.

The Disrobing:

Spurred by Karna's words and Duryodhana's command, Dussasana starts disrobing Draupadi.

Divine Intervention:

Draupadi's prayers are finally answered by Lord Krishna who blesses her with infinite amount of dress material, thereby saving her dignity in the middle of the court.

The Curse:

Draupadi begins cursing the Kauravas after one of the courtiers speaks on her behalf. She curses the kingdom to get destroyed but the King interrupts and tries to calm her. She wins the freedom of her family and the kingdom back.

Draupadi Version:

These are the beats in Draupadi's version of the same episode:

The Uninvited:

Dussasan enters Draupadi's private chambers, uninvited. She begs him to leave but he refuses. He drags her by her hair to the court, insulting her all the way.

The Arrival:

Draupadi is brought to the midst of elders to the court where women are not welcome at that time of the month. She is torn between fear, insult and embarrassment and begs her husbands to punish the man who touched her hair. They do not seem to move.

The Pleading:

Draupadi questions the rules, the elders' integrity and the culture and values of a family as they all seem to ignore her words.

The Taunt:

Duryodhan insults her by asking her to join him and sit on his lap. This makes Draupadi immensely angry and makes one of her husbands swear in rage.

The Disrobing:

The Kaurava prince starts disrobing her. She tries escaping but eventually resigns to God and starts praying for a miracle.

The Garden:

She sees herself in a garden with Lord Krishna, her brotherly figure who consoles her and makes her look at the whole issue from a different perspective – "You are not the one to be embarrassed. The others who have allowed such an ignoble act are the ones to be embarrassed."

The Curse:

She returns to reality only to find her dignity intact like her clothing. She vents her anger at the Karuavas by cursing them to death as the husbands too join her.

Karna's Version:

The following beats are from Karna's version of the same episode:

The Game:

Karna relishes in the possibilities after they win the game against Pandavas.

The Arrival:

Karna suggest Draupadi be brought to court.

The Insult:

He takes revenge on Draupadi for an insult from their past, by calling her a whore who shares husbands.

The Disrobing:

Karna suggests the disrobing of Draupadi and immediately starts regretting his mistake.

The Conflict:

For the rest of the episode, he is silent and feels bad for his actions but his tied down by loyalty to his friend.

The Divine Intervention:

God intervenes.

The Reflection:

Karna reflects on his actions.

THE INTERACTION PATTERN AND FLOW OF STORY:

At any point in the episode, the user can choose a different point of view to look at a specific scene. This will reflect on the character maps, the images, the textual content and the videos based on the character of choice.

This allows the users to understand the different perspectives of the episode.

DEMO SCRIPT:

The user chooses the neutral version first.

1. The end of the game is described, followed by the sending of the prince to Draupadi's chambers.

The user switches to the Draupadi version.

1. Draupadi pleads, explains her situation and asks the man to let her go.
2. She is dragged by her hair to the court.
3. She begins requesting the elders to help her.

The user switches to the Karna version.

1. Karna insults her by calling her a whore.
2. He suggests her disrobing.

The user switches to the Draupadi version.

1. She imagines herself in conversation with Lord Krishna in a beautiful garden.
2. She returns to reality and starts cursing the enemies.

The neutral version

1. The King appeases her by offering to free her and her husbands.
2. Preparations start for another game.

Implementation of the functional system:

The product has different features implemented using different technologies.

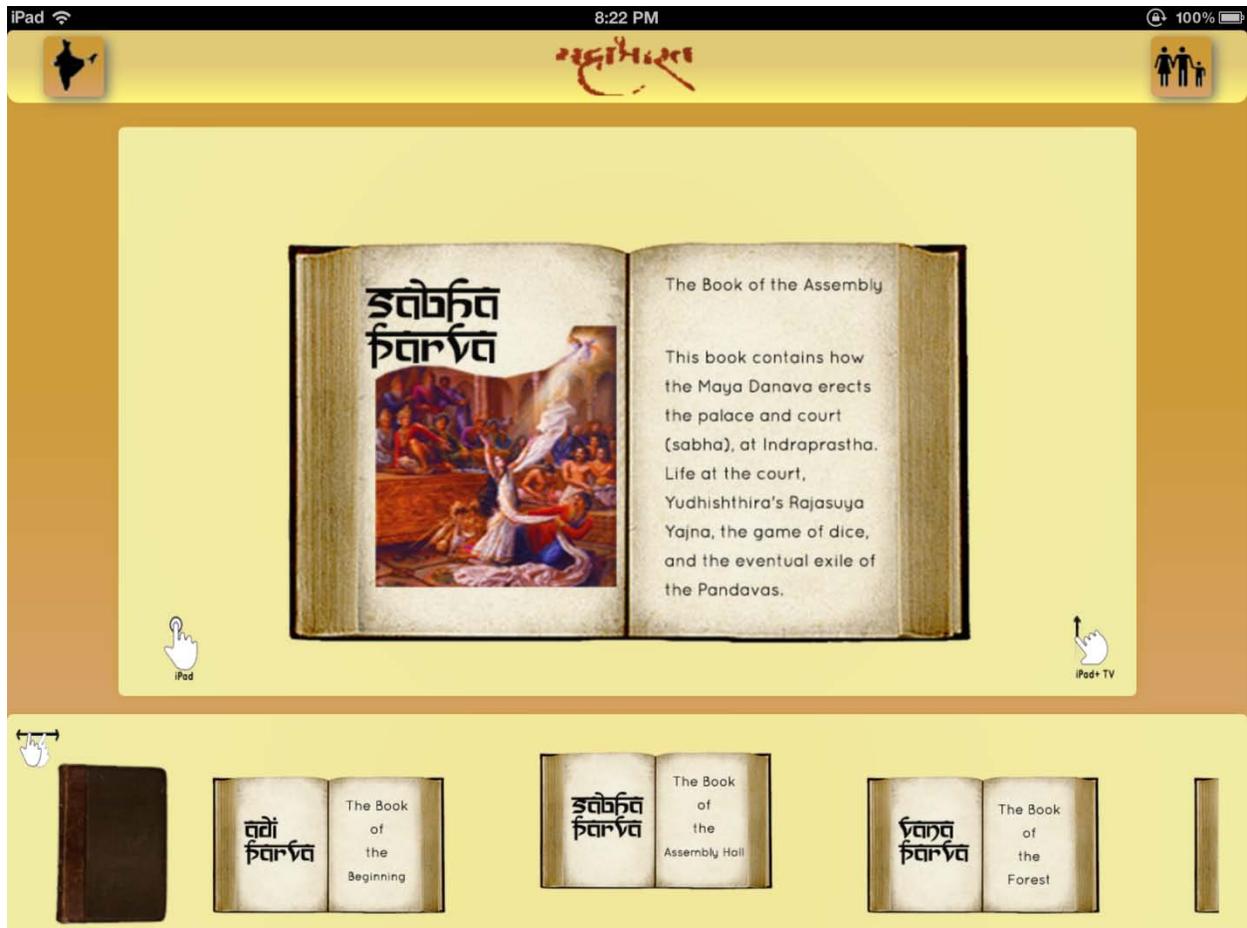
The whole application is based on web technologies such as HTML5, CSS3 and Javascript. Different javascript plugins, frameworks and libraries are used for the iPad application.

The TV synchronization was done using web technologies and PHP-MySQL.

The Application

The application can be described in terms of its four key features.

The Library:



Functions:

A scrollable list of 18 books from the Mahabharatha.

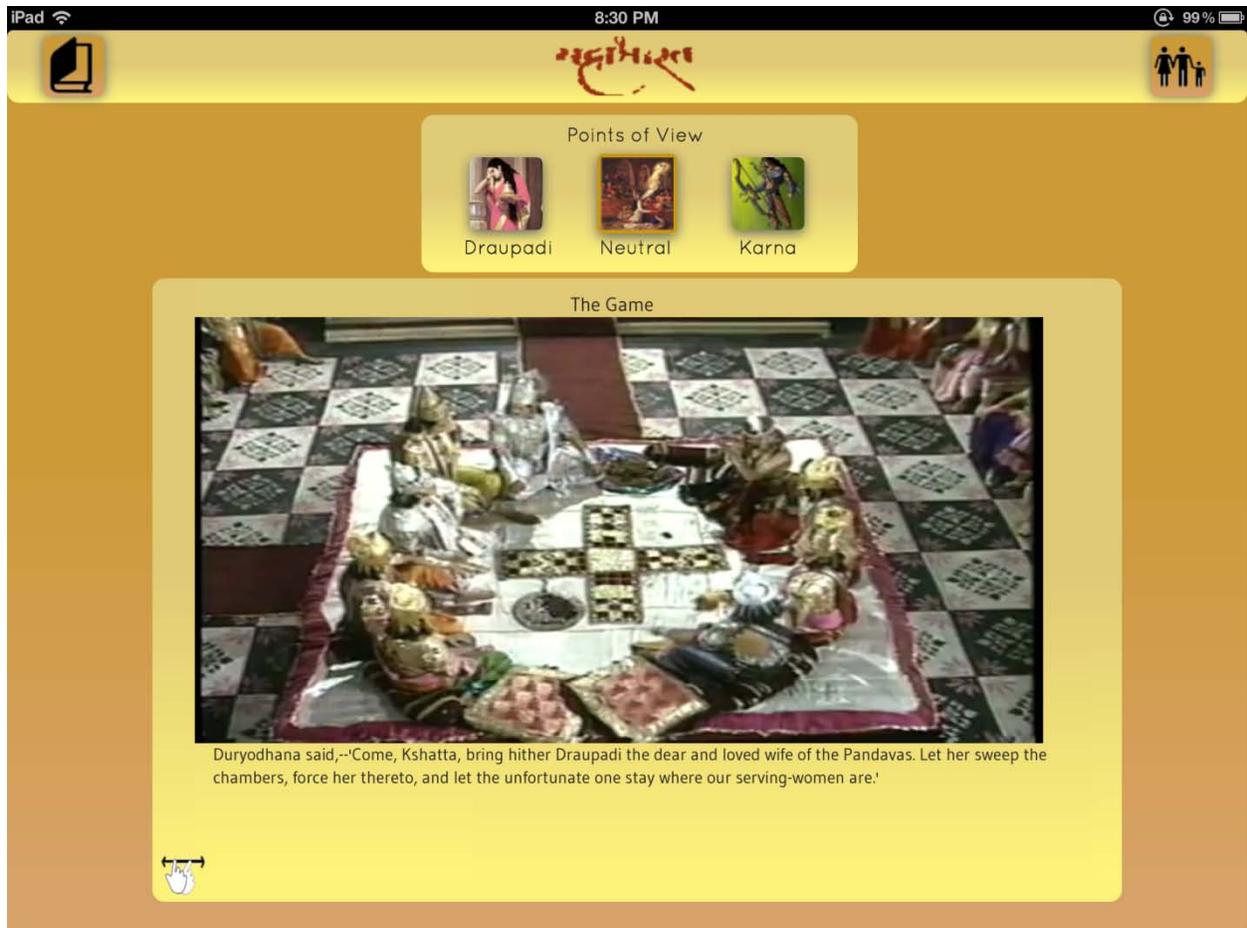
Links to the character map and the Map of Life.

Tap on a book from the scrolling panel to view its description.

On selecting the book, swipe down/ click to open it as a stand-alone application on the iPad.

Alternately, you can flick the book towards the television to play the corresponding content.

The Story Navigator



Functions:

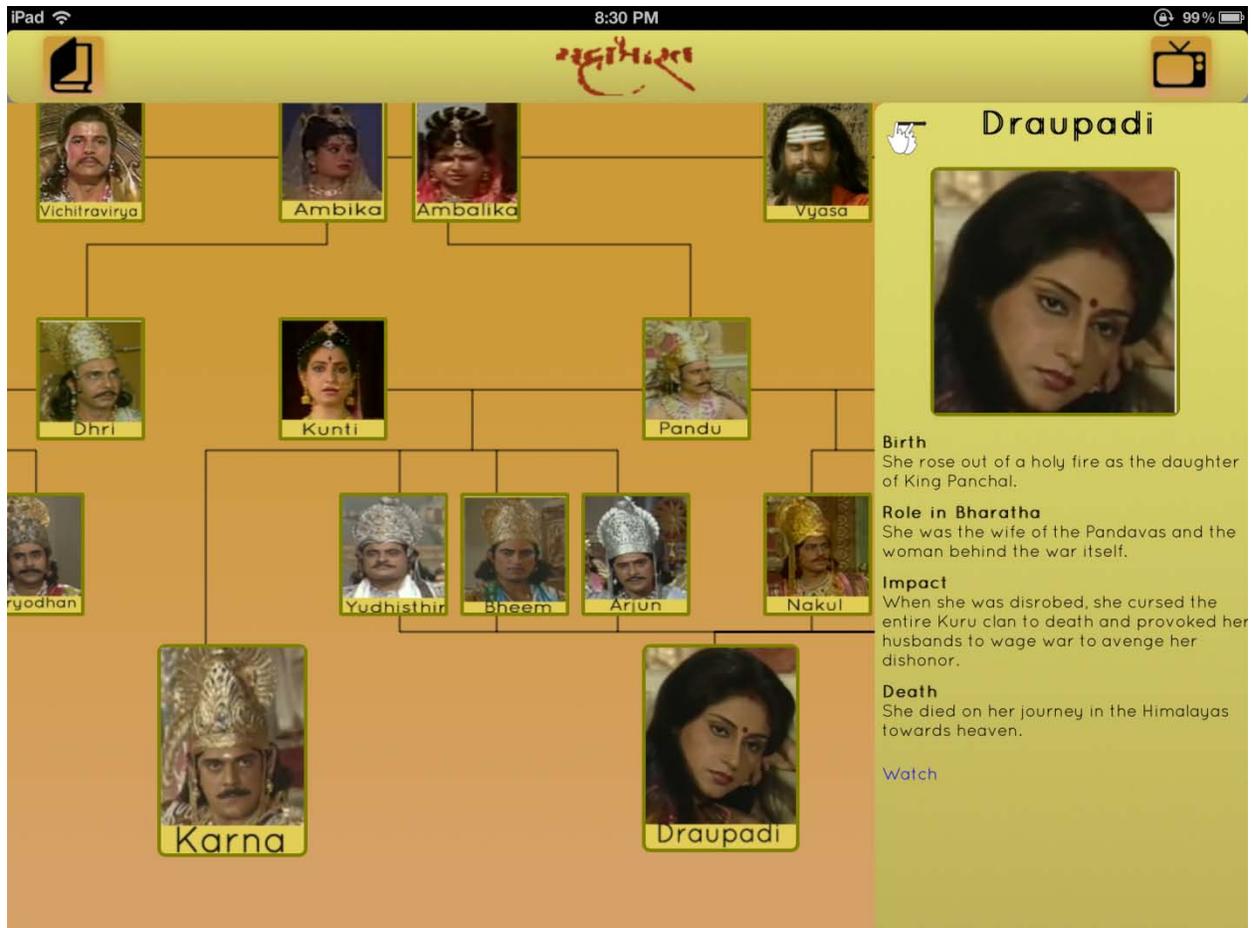
Links to the Library and the Character Map.

An option to switch across different points of view using a single touch icon.

A stage area which updates the image and the text in sync with the television.

Scroll through the stage area to push the video to different points allowing two way communication between the TV and the iPad.

The Character Map:



Functions:

A large panel containing all the important characters and relationships that can be scrolled both ways by touch.

Tapping on any of the characters will summon a side bar that contains a detailed description of the character.

Links to the Navigator, the Library and the Map of Life.

The Map of Life:



Functions:

A text-based animation tracing the journey of life of each key character in the Mahabharatha.

A scrollable pane on the right that is supplemented with the story as the animation proceeds.

On completion, the entire life story of that character is available for viewing.

Use of Gestures:

The application makes use of a few gestures specific to the application.

Flick to play video

At the Library, the user can choose to either open the book as a stand alone iPad app or a TV-synced one. In order to play the TV content, the user shall flick the book on the screen towards the TV causing it to play.

Scroll through lists

The list of books at the Library can be scrolled by flicking with a single finger on either direction.

Scroll through character map

The character map consists of a huge pane with a web of characters that are not visible at the same time. The pane can be move around with a single finger scroll

Swipe to hide

Side bars can be swiped to hide.

User testing of functional system:

The interface, now with all its functionalities complete, was tested by users who were also part of the initial user testing. This time around, they were expected to fully interact with all the features available on the application and give feedback on the application's design in terms of the front-end and the back-end.

The primary purpose of the final user testing was to ensure that the application met the requirements expected to be fulfilled and it does so in a user-friendly manner. The following were given priority:

Working of all the features in the application.

Design and Interaction, Ease of use and clarity of affordances.

Three of the six users employed for the user testing were made to use the application without the TV synchronization and were observed on the ease of use and interaction patterns. The other three tested, along with the other features, the TV synchronization part. Each user was questioned later on about the different features of the system.

Users:

The users for this testing were all from the initial user study. These were students who had an idea about the requirements of the system and had experience using an iPad as well as companion applications. They were instructed to keep track of usability issues as they used the different features.

The technique followed was similar to the initial study where the participants were observed as they used the system and questions were asked after the session. The summary of results from the different sessions of user study is as follows:

“The feature where we can track a character’s life journey seems extremely interesting and cool.”

“There should be better ways of navigation across the different screens. I could not go back to screen X from screen Y at any point.” (This particular problem was addressed immediately and now there is an easy way to switch across different screens.

“I understand there is a need to switch across different versions. But is there any option to add more characters to the list so that I can see the story from the POV of my favorite character.” This could not be addressed as there are little textual content from the POVs of all characters.

It was also observed that all users during the first session had a very tough time with understanding the affordances of the system. Since the system uses gestures that are not obvious, they had to be explained the different interaction methods. Before the final user testing, all interaction methods were mapped out on the screen to make it clear to the user.

Three of the users tested the product once more after all the implementation was done and stated that the interactions were much easier and straight forward in the new version.

Conclusion & Future Work

The work was heavily disadvantaged by the lack of access to a lot of design artifacts and the magnitude of the epic kept the product from being complete in a span of two semesters. The future work on this application will include a lot of data collection from different locations of archaeological importance relevant to the Mahabharatha and adding data from the entire set of books into the product.

It would also be a very useful task to port the application from the web platform to the native platforms so that it can be downloaded from the App Stores or the Android market.

Once the final product is done, it shall be user tested in the usability lab at Motorola Mobility who have expressed their interest in user testing the product.