SRS Report

Augmented Reality

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INTRODUCTION:-

The main objective of the application is to show the information of the monument being captured in the museum by the camera phone. After capturing the image or simply pointing the phone camera towards the monument, the app will detect the monument and then information about that artifact being captured will be shown.

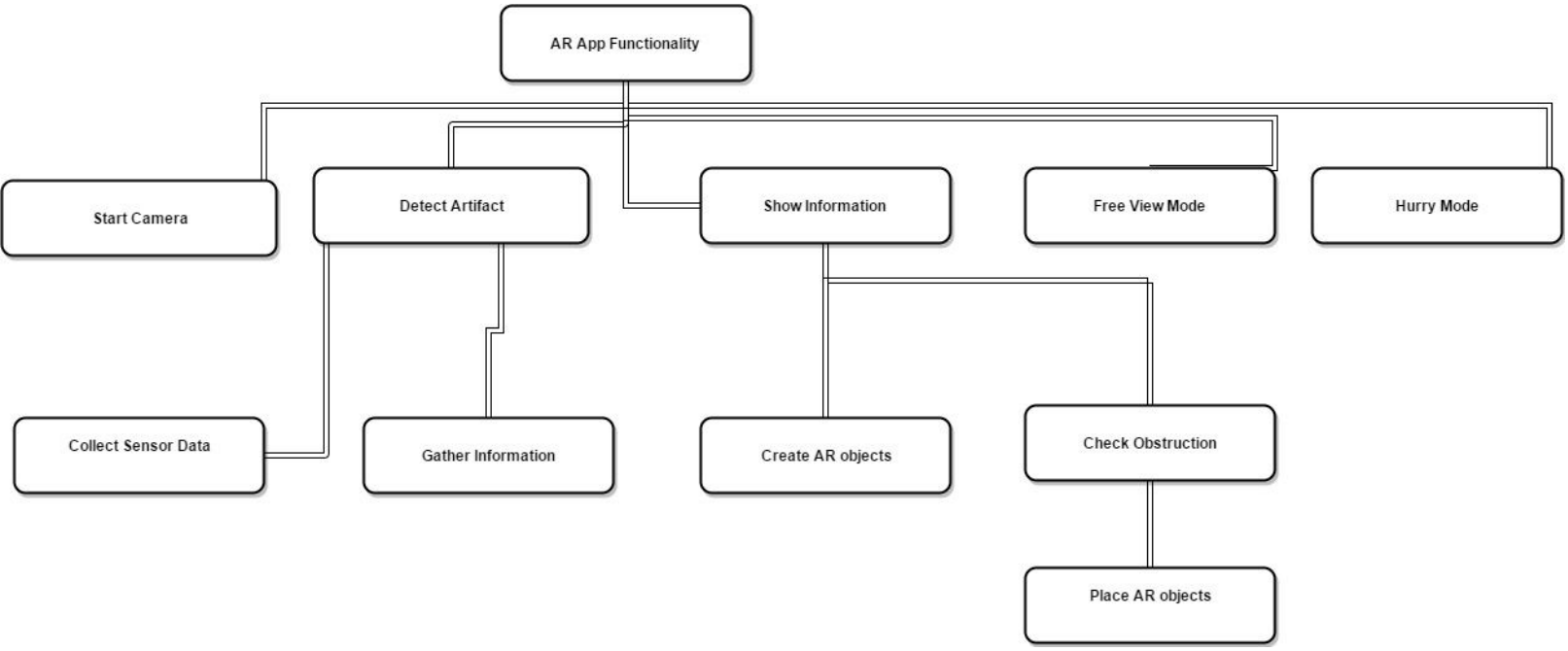
THE TARGET AUDIENCE : Visitors of Museum having access to a smartphone

The user of the app is the common people who will visit the museum and wanted to know the information about some monument and suggestion related to the monument quickly. There is an audience which does not have a smartphone but they can rent it at the museum facility, so they will also be included in our target audience.

FUNCTIONAL REQUIREMENT ANALYSIS:-

Most Important and Basic feature : Being able to point the camera to an artifact and seeing information floating besides that artifact.

The Task hierarchy



Overview of Functional requirements (Modules) –

Start Camera:- accessing the app through the camera. The camera in work can be back camera as well as front camera according to the convenience of the user.

Detect Object:-The camera will point towards the object and detect it(the user doesn't have to take the picture, the picture will be taken automatically for the history log

Gather Information :- After detecting the object, all the related information should be loaded. Details of information is given in next section.

Collect Sensor Data:- When the object is getting detected, the mobile will store the sensory data from the mobile (sensors like gyroscope and accelerometer)

Create AR objects :- Based on the object detected it will create an AR object and will show on the screen

Place AR objects :- According to the collected sensor data, the object is shown besides the object after doing following check accordingly.

> **Check Obstruction** (sub function) **:-**
> The information to be shown should not obstruct the user's view. If it does, the way of displaying information **should adapt to the view.**

Free View Mode :- Rotatable objects and floating information such that - the user can rotate the object to see its 360 degree view. Also the position of the AR object can be changed on the screen and can be zoomed to see the details of the object.

Hurry Mode :- Include a quick guide mode which will help the user to see the best parts of the museum in the least time taken.

The user can **see other people's preferences about the monuments** in the museum .

> Also the user should also be able to **sort by popularity** to see the most talked about monument in the museum.
>
> It should also **show reviews** given by the people who have already been there. So, for the same reason, the user will also be able to **give their own review** in this quick guide mode.

Details about the functional requirements -

The main purpose of the application will be to capture the image and then shown the related information on the screen. The extra features added to the app are :

1. that the user will be able to quickly and **conveniently be able to switch between the front camera and back camera**. The above mentioned feature is added to increase the usability of the app i.e. in case back camera is blurry or doesn't work properly, the app will be able to capture the image from the front camera and thus using the main purpose of the application via front camera of the phone instead of the back phone camera.

2. Also App should support Auto-rotation so that the camera field can cover horizontally oriented artifacts easily and also users who are comfortable with either horizontal or vertical view of the phone can easily switch between the two orientation and thus conveniently make the user choose his comfort orientation.

3. **History (recent searches, previous visits, list of already covered artifacts)** is also added to the application. This feature will be accessed through the main screen of the application by using a tab button. This feature when used will be able to tell all the past history about the monuments' the user has seen and it will also show the related information about the monuments that the user has seen. It will include the **date, time** and some other related information about the situation while seeing the monument and through that history the user will be able to see the information about the monument that that person has seen. But there will be another option to pause the history log whose function will be to stop creating history logs. This feature is added so that if the user is having less or insufficient space, the user can pause history logs and thus stop creating metadata. Though, even if the user is having insufficient space, the app will tell user about the insufficient space and automatically turn to pause history log option

4. The other feature which is included in the application is **the map**. The map will show the monuments on it and the names of those monuments and show the path to it. It will include navigation system which will help the user to track the monument. But, yet another feature for the convenience has been added to make the tracking of the monument in the museum easier that is **footsteps**. This will when pointed to the monument (pointed means touch or selection the monument in the map)to be tracked in the museum shows the way through the camera of the phone visually with the help of the footsteps.

The map shall also include the paths to Washrooms as well as Food & Water Facilities.

5. The app will also be having reminder feature i.e. it will remind the event that are scheduled to happen in the museum in that day with it, the app will also show all the events that are scheduled to take place that day or any other day in the museum. It will also include extra feature i.e. selective reminder where the user will not get the notification and reminder of all the events that are scheduled in the museum rather only the specific ones that the user has selected. For example, the App will show notifications for special events like Planetarium show in the Museum at half an hour before start of the event. This feature will also have a fast mode where the user will be reminded only about the most talked about events in the museum.

Performance Requirements:-

The capability of the device depends on the performance of the software. The app shall be able to handle any quality input ranging from 360p to 1080p Full HD of video input provided the RAM and other device specs are sufficient like space as insufficient space may create problem in installing the app or after installing it may create problem for loading or detecting the image because it will create logs but in that case the history logs can be paused. This would depend on the available memory space on the device.

NON FUNCTIONAL ANALYSIS:-

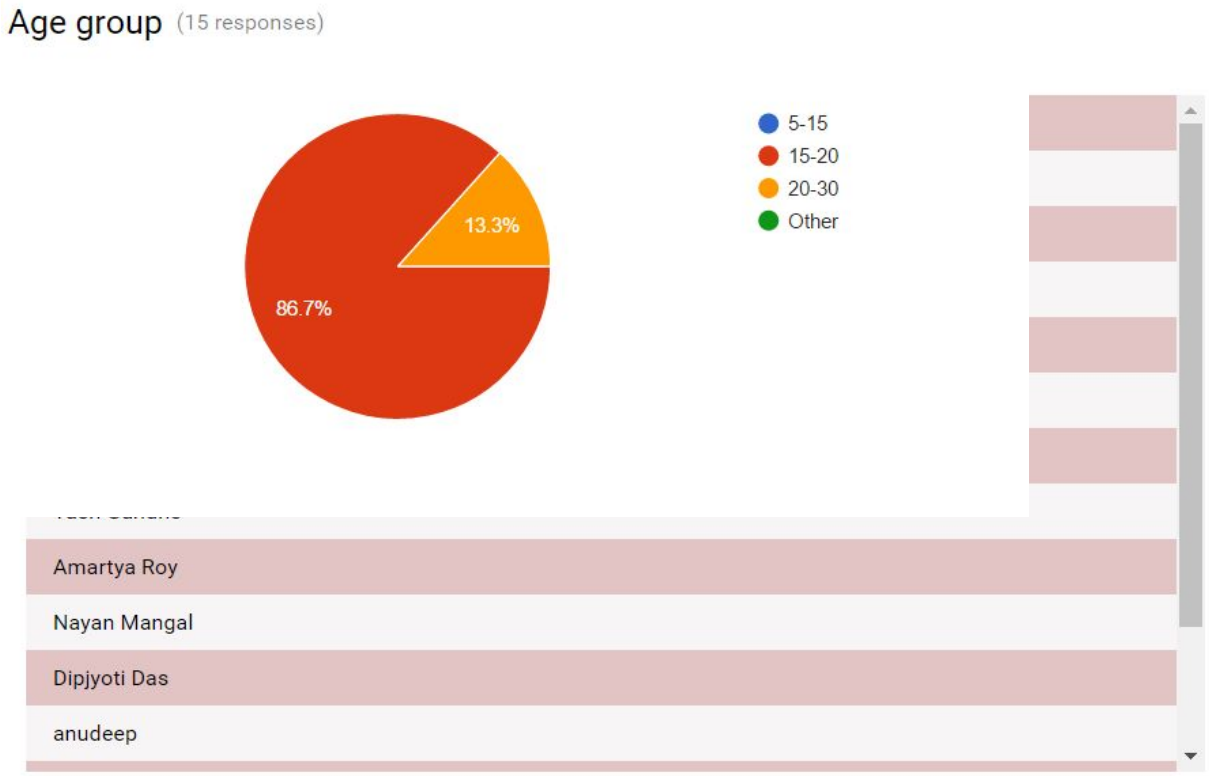
Data collected from Contextual Enquiry:

Here is a list of questions asked to a group of 15 people from our campus and their responses statistics.

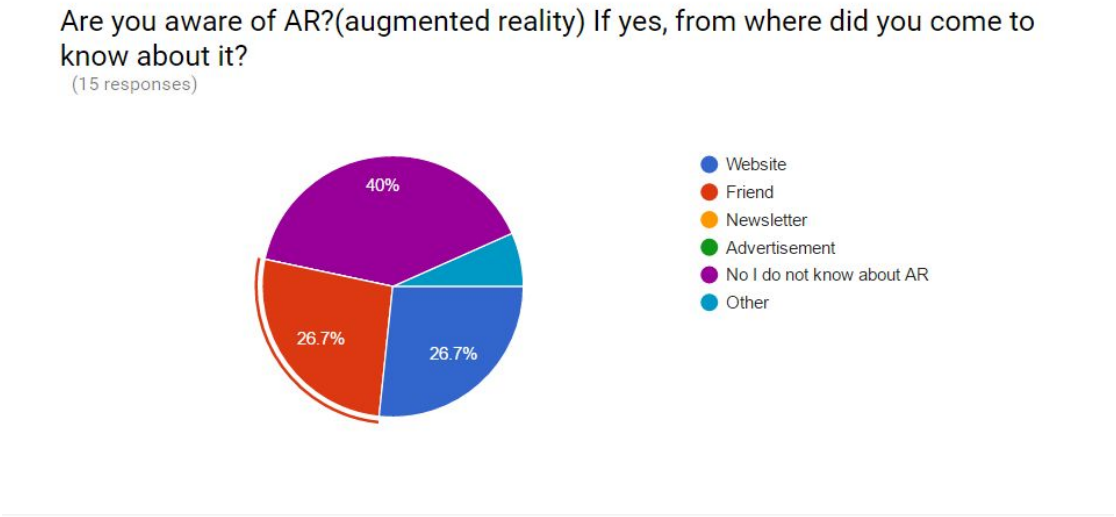
The following pages contain images containing statistical data from the survey questions.

While asking the questions, we also asked the reasons for choosing each options given (including 'Others'). The reasons are also stated below each of the images.

Each question's response is expressed in form of a pie chart and the conclusions drawn are written below the images.

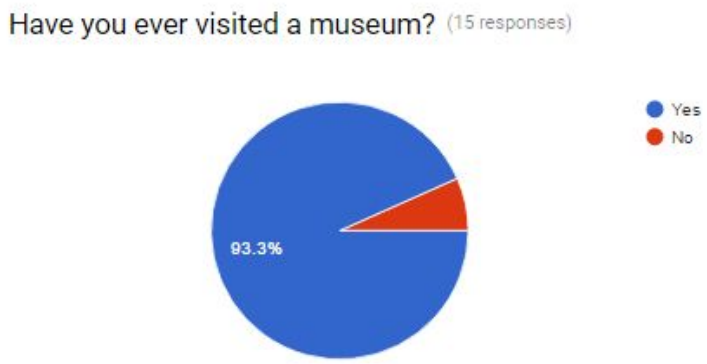


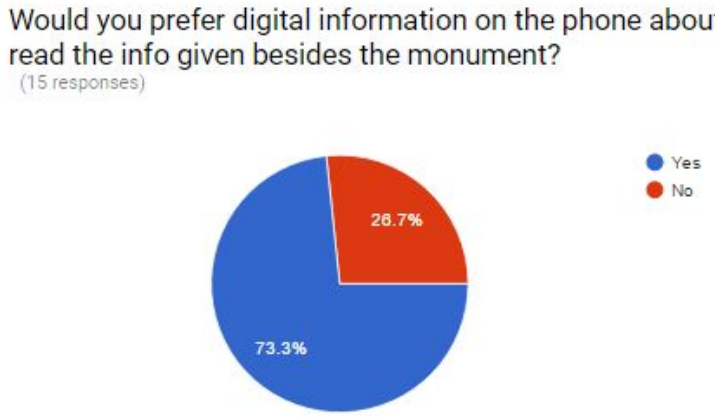
Q-1) Survey was conducted on the audience out of which age of two people is above 20 and the rest are below 20.



Q-2) The data acquired during the survey showed us that 40% of them don't know about the AR(Augmented Reality) and the other 60% have a slight idea above it. Further, in the survey we found that 27% of them came to know about the AR through a friend or a relative, 27% learned its existence and few things related to it through social media, online articles, forums and advertisements while the rest 6% learned about it through some other unknown sources.

Q. 3,4)

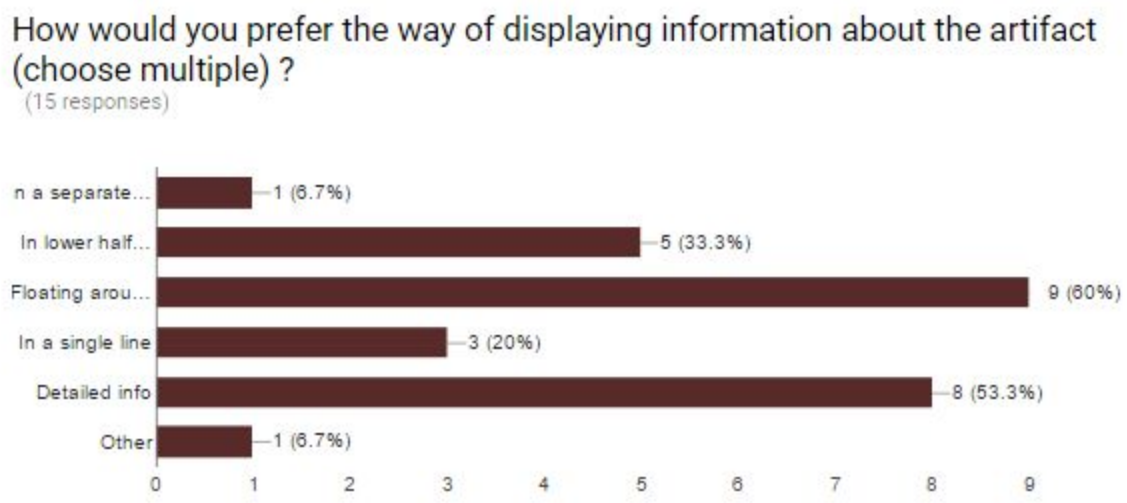




On asking, about their visits to some museum, we came to know that 93% visited a museum at least one in their life while rest 7% never **visited any museum**. Then we asked them about their experiences and expectation from a museum and the way of information about the things displayed in the museum.

Around 27% people were **satisfied with** the way and the amount of **information as provided by the museums** while the rest weren't satisfied with it. So, the rest 73% would prefer a more detailed and organized information mostly by means of digital information on their mobile phones and tablets.

Q-5)

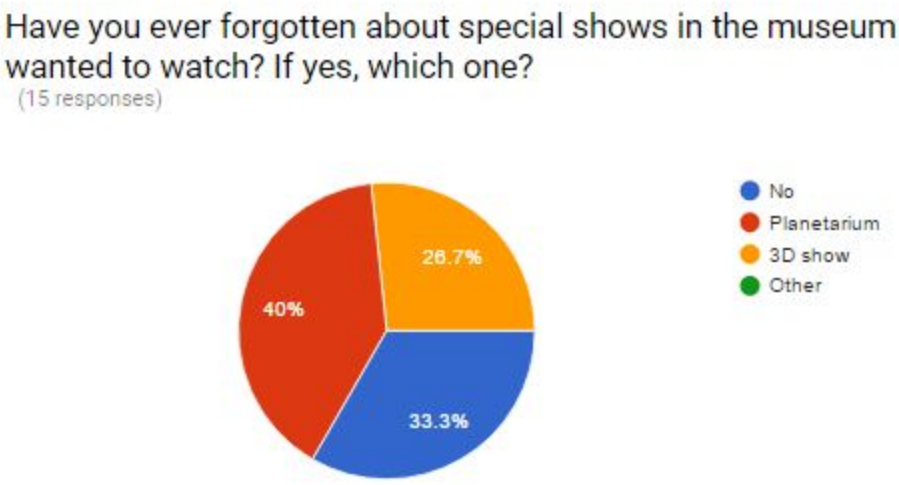


The options (not clear in image) shown were-

1. In a separate window
2. In lower half of screen
3. Floating around the artifact
4. In a single line
5. Detailed info
6. Others

Then we asked them about the mode or way of information about the monument they would prefer. So, most of them wanted the **information floating** around the artifacts in AR object or a detailed information about the monument in different window and the information in simple single line or in the lower half of the screen is favored least by the people.

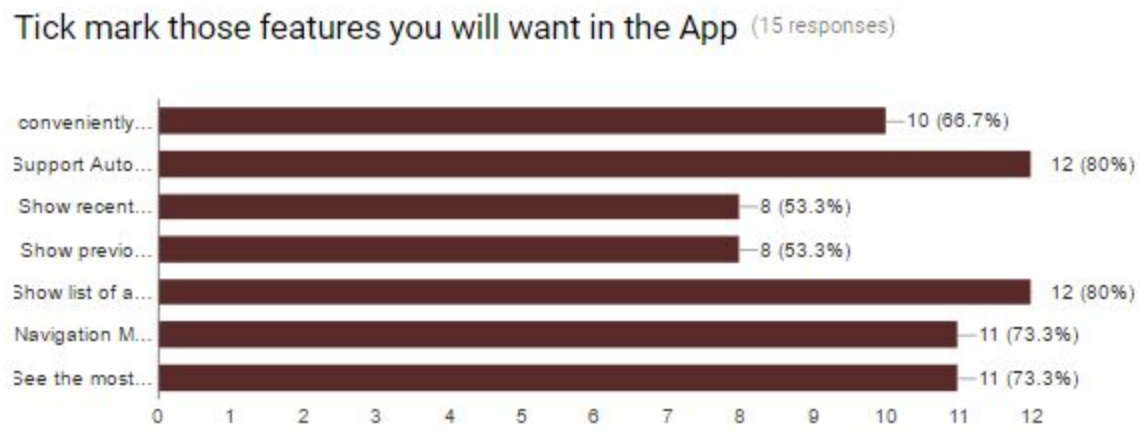
Q-5)



When we asked about the reminder feature of the app, we found that 33% of them never forgotten or got late for planetarium or 3D show. However, 27% of them got late for a 3D show and 40% got late for planetarium show. So, we found that this feature is wanted by the majority of the people.

Q-6) After the above questions, The respondents were asked which features they would like in the App-

The response was as follows -



The options (not clear in image) were -

1. conveniently be able to switch between the front camera and back camera
2. Support Auto-rotation
3. Show recent searches
4. Show previous visits
5. Show list of already covered artifacts
6. Navigation Map with AR paths/trails
7. See the most talked about monument in the museum as per the review given by the people
8. Others

So, on the basis of their smart phones and the specifications which include memory, speed, sensors and other functionality, we asked them few question on the features they would like in the app. So, we gave them few features and asked the utility of those features in the app. So, around 67% of them wanted to **switch between the front camera and back camera** in case their front camera is better than back camera or their back camera is not working while the rest 34% people think that it has very less utility or almost negligible utility and would only take extra memory in the phone.

We even asked the **auto rotation feature** to them and 80% would favor the auto rotation feature as it is convenient for them so that they can hold the camera in whichever orientation and also can detect the monuments horizontally or vertically oriented easily without manually changing the orientation. However, the rest 20% see this feature as cumbersome as whenever they would change the orientation of their device the app will also change its orientation.

In the customer review, we found that around 53% people would like to have a **history log** where they can see the past searches and the previous visits in the museum they had and the rest 47% found this feature having no utility.

However, 80% prefer that they would like to see the **artifacts they have already covered** as it would help them to plan and would avoid seeing the same artifacts or going towards that direction again and again while the rest told us that they wouldn't use this feature more oftenly or wouldn't use at all.

Further, we found that out of 15 people, around 73% would like to have a feature where they can see the **navigation system with footprints AR** which will lead them to their destination through the footprint shown in their mobile phones or tablets. They would also like to see the most talked about monument in the feature as it would help them navigate through the monuments in the museum as quickly as possible and talk about it online through the app. While the rest 27% would not want to have any such features as it would take lot of battery and space.

Hence the Nonfunctional Feature Requirements can be listed as follows from the above statistics -

1. Switch between the front camera and back camera
2. Auto rotation feature
3. List of Artifacts already covered
4. History log
5. Navigation system with footprints AR

Finally, We Also listed out which information will be shown about the monuments :

- **history,**
- **Artists,**
- **Date of creation,**
- **name of the monument,**
- **the tools and monuments used** in creation of the artifact, sculpture or monument,
- **meaning of the art** as explained by the creator and/or philosophers**,**
- **steps taken** and taking for the **protection and preservation** of that monument.
- it should show a **rotatable and scalable 3D model** of the artifact for those artifacts that are against the wall and cannot be seen from other side.
- It will be properly **grouped in different sections,**
- linking the words to the page which shows the **meaning of those words** or related information about it like synonyms, antonyms, **language of origin...**
- **Suggested artifacts** or monuments or paintings **based on the similarity** of the two monuments.