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# SURVEY

## Smart Itinerary Survey – 18 Questions

The purpose of this survey is to learn about user experiences with other travel applications, which factors are most important when designing an itinerary and what features are necessary to incorporate into a travel application.

Q1 How old are you?

---

Q2 What is your country of origin?

---

Q3 Please specify your ethnicity.

- White
- Black or African American
- American Indian or Alaska Native
- Asian
- Native Hawaiian or Pacific Islander
- Other \_\_\_\_\_

Q4 Do you own a smartphone?

- Yes
- No

*Skip To: End of Survey If Do you own a smartphone? = No*

Q5 Have you travelled in the past five years?

Yes

No

*Skip To: End of Survey If Have you travelled in the past five years? = No*

Q6 How often have you travelled in the past five years?

	Never	1-3 Times	4-10 Times	>10 Times
Domestically	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Internationally	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Business	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Leisure	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Personal	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q7 How do you usually plan your trips?

Travel agent

Travel application

Improvise

Web Searches

Advice from Family/Friends

Other \_\_\_\_\_

Q8 Which travel applications have you used in the past five years?

- Google Trips
- Trip Advisor
- Sygic Travel
- TripIt
- trvlGenie
- Blink
- Other: \_\_\_\_\_
- None

Q9 Please write any comments about your experience with these applications.

\_\_\_\_\_

Q10 When considering visiting a particular destination, how important to you are each of the following factors?

	Not important at all	Just a little bit important	Moderately important	Very important	Extremely important
Accessibility Needs	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Budget Constraints	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Group Size	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Dates/ Season of Travel	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Weather	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Personal Interests	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Transportation Time	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Crowds	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Age Restrictions and Suitability for Younger Children	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q11 Please rate the importance of the following features of travel applications.

	Not at all important	Just a little bit important	Moderately important	Very important	Extremely important
World Time Converter	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Language Translator	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Currency Converter	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Site Specific Information	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Audio/Video Clips (provide background information on specific sites)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Health and Disease Information	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Car Rental Services	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ride Sharing Integration	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Flight Booking	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ratings and Reviews	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Social Media Integration	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ability to see other users' trips	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
GPS Navigation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Bathroom Locator	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Location-Based Emergency Services	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Location Tracking	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Weather Forecasting	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Dining Locator	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Itinerary Generator	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Save Trips (For later, edits, wishlists)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Site Selection	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ability to purchase admission tickets for attractions	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Coupons for attractions	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Hotel Booking	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>



Q12 Have you ever travelled to Armenia?

Yes

No

*Skip To: End of Survey If Have you ever travelled to Armenia? = No*

Q13 For what reasons have you visited Armenia and how often?

		Frequency			
	Never	1-3 times	4-10 times	> 10 times	Always
Leisure	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Business	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Personal	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q14 Please list specific sites you were or are interested visiting while in Armenia.

---

Q15 Please rate how comfortable you are using smartphone technology.

- Extremely comfortable
- Somewhat comfortable
- Neither comfortable nor uncomfortable
- Somewhat uncomfortable
- Extremely uncomfortable

Q16 How have you planned your trip to Armenia

- Travel Agent
- Travel Application
- Improvise
- Web Searches
- Advice from Family/Friends
- Other \_\_\_\_\_

Q17 Which travel applications have you used to plan a trip to Armenia

- Google Trips
- Trip Advisor
- Sygic Travel
- TripIt
- trvlGenie
- Blink
- Armenia Guide - Your Yerevan Guide
- Armenia Travel Guide - Triposo
- Armenia Tourist Guide

AGBU Kids Travel App

Visit Armenia

Other \_\_\_\_\_

None

Q18 Please write any comments about your experience with these applications.

---

# SITE VISIT FORM

1. Name of Site
2. Available online information
  - a. Mark only one oval
    - i. A lot
    - ii. Some
    - iii. None
3. Available onsite information (signage)
  - a. Mark only one oval
    - i. A lot
    - ii. Some
    - iii. None
4. What languages were these signs in?
  - a. Check all that apply
    - i. Armenian
    - ii. Russian
    - iii. English
    - iv. Other:
5. Condition of signs (if applicable)
  - a. Mark only one oval
    - i. Great condition
    - ii. Good condition
    - iii. Bad condition
    - iv. Really bad condition
    - v. N/A
6. When travelling to this location, how hard was it to navigate through the site
  - a. Open response
7. Maintenance of site
  - a. Mark only one oval
    - i. 1 - Terrible
    - ii. 2

iii. 3

iv. 4

v. 5 - Great

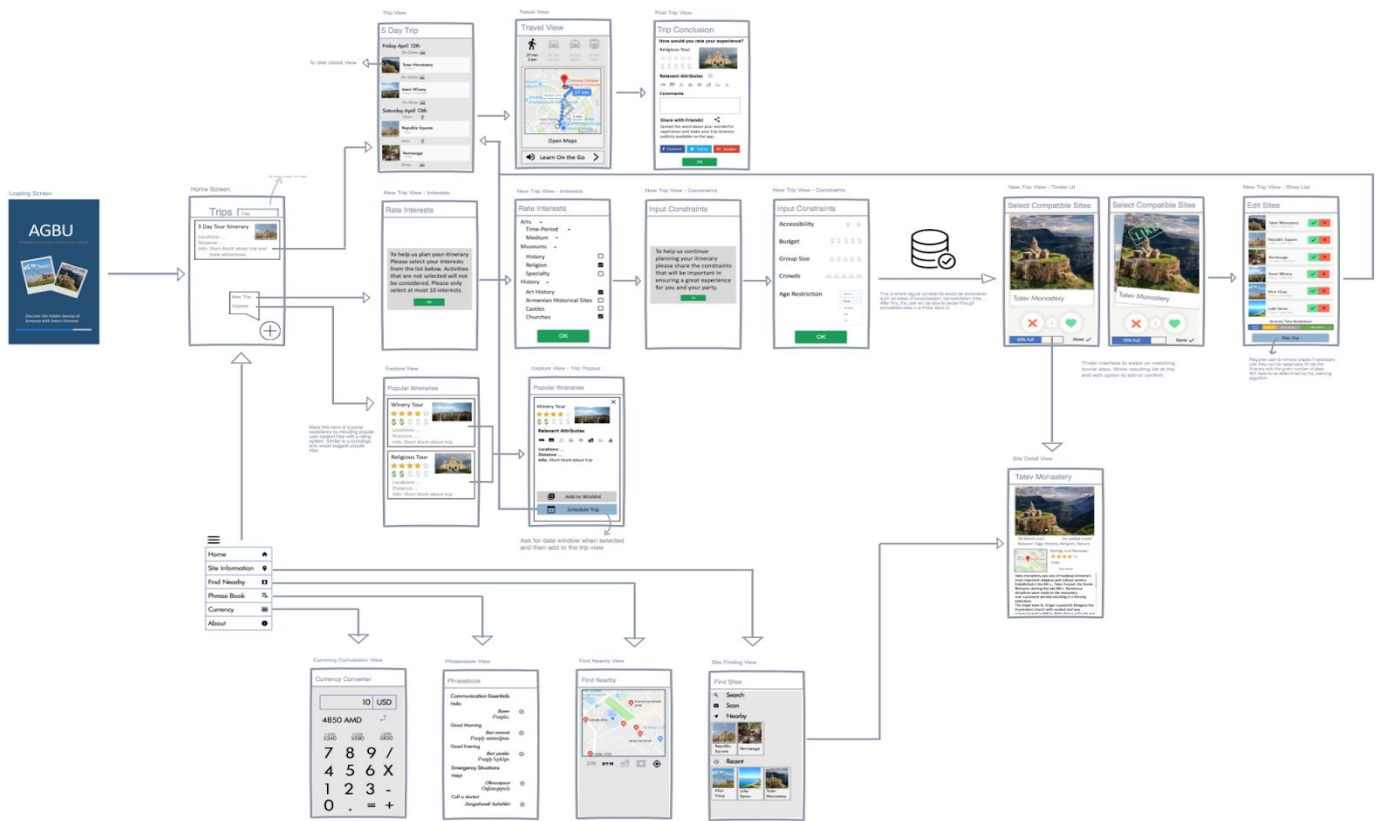
8. Is it clear who maintains the site?
  - a. Yes
  - b. No
9. Comments about the overall visit
10. Are there any pictures from the site?
  - a. Files submitted

# MOODBOARD

Link to Moodboard: <https://projects.invisionapp.com/boards/6N3TJDGT3SC/>

# WIREFRAME

Link to Wireframe: <https://projects.invisionapp.com/freehand/document/tNyd1dlyN>





# SDLC APPROACHES

## Mobile App Development Process

Mobile app software goes through multiple phases of development, called the software development life cycle (SDLC). The main phases of the SDLC are: requirement gathering and analysis, design, implementation or coding, testing, deployment, maintenance.

(ElysiumAcademy, 2017). There are multiple models for approaching these phases, each with their own advantages and disadvantages. The most widely known approach to the SDLC is the waterfall model (Figure 1). This model is linear, completing each phase before moving on to the next. The model is most often used for projects with clear, well-defined goals where the requirements will not change. It is easily explained to others and easily planned. However, the waterfall model does not define a process in which returning to a previous phase is allowed if redesign is needed. Overall, the waterfall model is costly and requires more time than other models, in addition to requiring a detailed plan to work well (Sami, 2017).

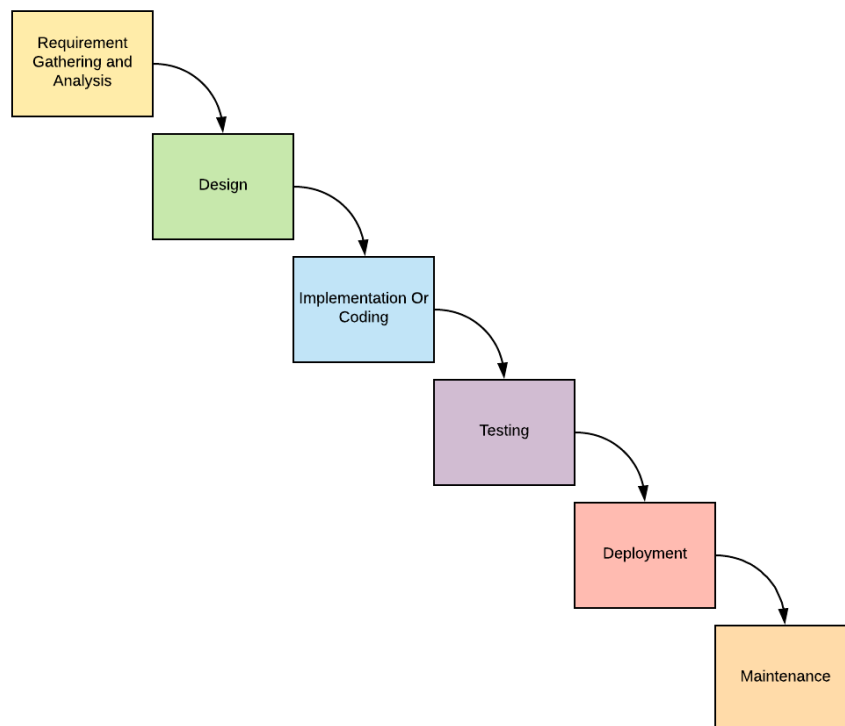


Figure 1: The Waterfall Development Model

Another, more practical, approach to the SDLC is the agile model (Figure 2). Instead of a linear approach, the agile method is based on incremental and iterative design that requires more collaboration. The agile method is based on multiple 2-4 week iterations called “sprints” with short daily meetings called “scrums.” After gathering requirements, the team converts them into objectives. During a “sprint”, the team works to complete their objectives. Each day, the team meets for a “scrum” where accomplishments and future plans are discussed. At the end of the “sprint”, the team presents the product to a client, and both parties discuss what needs work. This can produce new requirements for the team, but allows both the client and the developers to have a say in the development of the product.

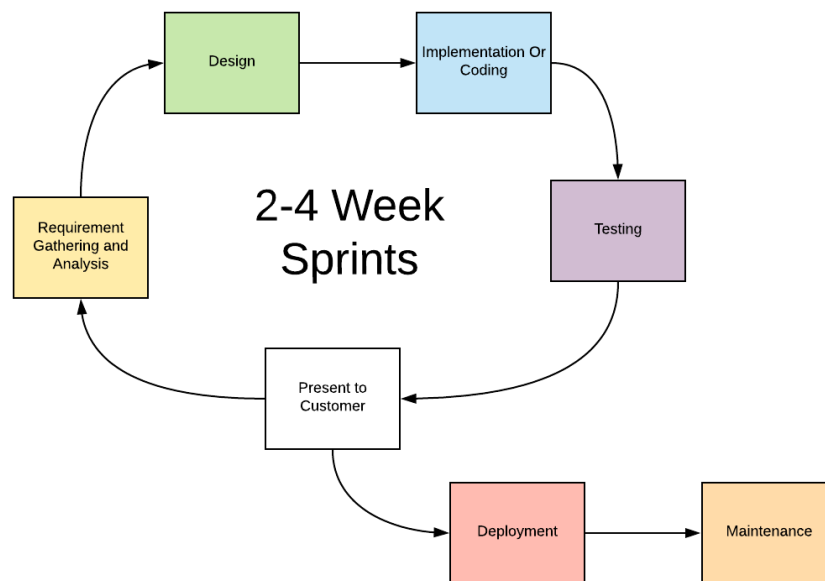


Figure 2: The Agile Development Model

The advantage of the agile model is that it is much faster, and allows for the team to work alongside the client to produce something that both parties can be satisfied with. However, the model necessitates that both parties can collaborate and communicate effectively. If the customer cannot communicate the needs of the user, the developers cannot create a product that will be successful. Additionally, the agile model relies on the developers to have the skills to produce a product within the time of a sprint, so they can have something to present to the customer. The agile method is great for collaborating with the client in an environment where the requirements can change, and is versatile enough to work with many project types (Sami, 2017).

# VALUE OF SMART ITINERARY

Link to Presentation:

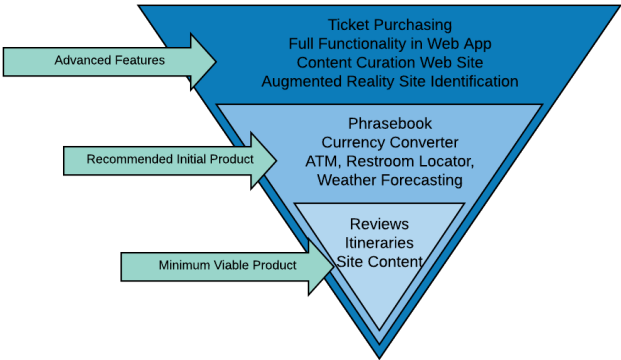
[https://docs.google.com/presentation/d/1PBh5sYjzm7Hgesgd0dHD3\\_qs3sCvcU6z9qh00g6\\_kpY/edit?usp=sharing](https://docs.google.com/presentation/d/1PBh5sYjzm7Hgesgd0dHD3_qs3sCvcU6z9qh00g6_kpY/edit?usp=sharing)

# DESIGN DOCUMENT

## Purpose and Objectives of the Application

The purpose of this application is to provide a free resource to tourists visiting Armenia to help them plan their trips, and better appreciate what Armenia has to offer. The app is designed to make personal recommendations of sites to visit in Armenia to simplify the decision of where to visit, and ensure the visit is relevant to the user's interests. The app will also deliver detailed content about the sites to visit to place the sites in context, and make visits more interesting.

## Design Complexity Tiers



## Minimum Viable Product

The purpose of the Minimum Viable Product (MVP) is to act as a simple itinerary planner and content delivery platform without spending significant resources on functionality that are not required to achieve this. The application would still include most of the content from the AVC ebooks, and a simple itinerary builder to match the user purely based on interests and constraints. The application would still include ratings from Google Places, and simple maps to show the location of sites, but would not include functionality such as currency conversion, and finding sites nearby that are currently achievable with other applications. This could also involve other simplifications to the application where the developer sees the potential to save costs.

## Recommended Basic Product

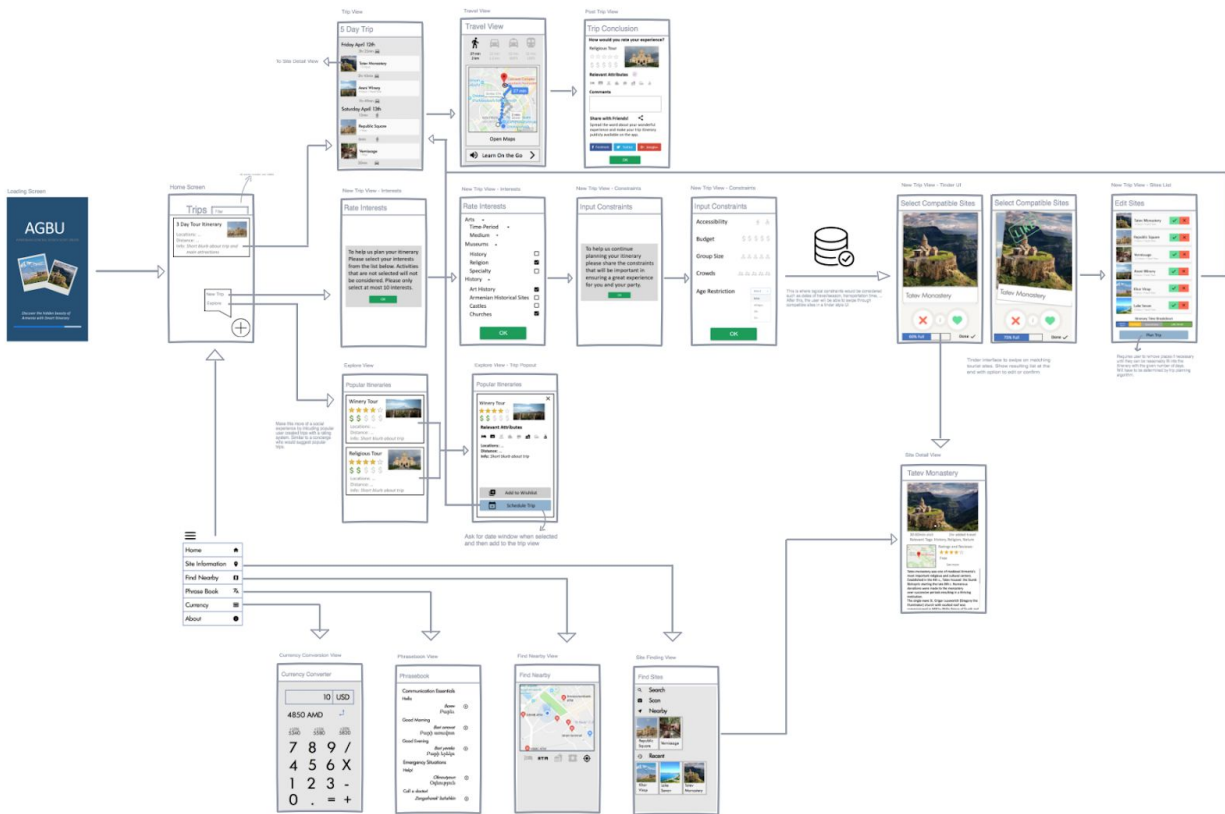
The Recommended Basic Product (RBP) is an extension of the minimum viable product that includes many enhancements to improve the user experience. This include small utilities

such as find nearby, and the currency converter that are not necessary to the core functionality of the app, but would be useful to tourists without adding significant complexity of the app. Unless otherwise stated, all functionality in the design specifications and wireframe would be part of the RBP, and would be implemented to work in all seven languages that the AVC has content in.

## Advanced Features

Advanced features most likely would not be included in the initial release of the application, but could be added based on analysis of the initial rollout. Features in this category include a website with the full functionality of the mobile application, the ability to sync an itinerary between travel companions, the ability to post a custom itinerary publicly for other travellers, a complete web portal with user permissions for adding content to the database, and augmented reality to identify landmarks and bring up additional content. Future versions could also account for more factors in the site recommendation algorithm. There is obviously also the possibility of additional features based on new technology, developer suggestions, or user feedback. Future versions may also account for a more advanced calculation of admission costs, and could potentially be used to purchase tickets.

# Wireframe



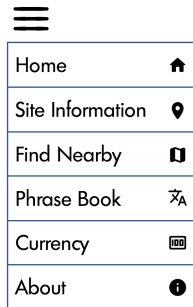
The full wireframe can be viewed at the following link:  
<https://projects.invisionapp.com/freehand/document/tNyd1dlyN>

# Moodboard

The inVision moodboard can be viewed at the following link:  
<https://projects.invisionapp.com/boards/6N3TJDGT3SC/>

# User Interface, and Interactions

## Navigation Menu



The navigation menu can be opened from any view and will have the following options:

- My Trips
- Site Information
- Find Nearby
- Phrase Book
- Currency Converter
- About

## Trip Information

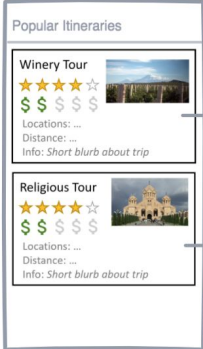
### Home Screen - My Trips



Saved trips appear with an image, duration, and basic description. Trips are ordered by when they were last opened, and can be scrolled through if they do not all fit on the screen. A drop down at the top of the screen allows users to switch between active trips, scheduled trips, and their wishlist. Tapping a trip opens the Trip View.

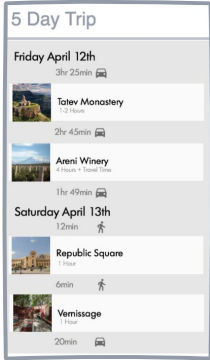
There is a plus button in the lower right that opens a tooltip to explore from a database of trips, or build a custom trip.

## Explore Trips



The explore trips view would appear very similar to the my trips view, except that trips would be selected from an online database of recommended trips. Selecting a trip will open the Trip View, where users can preview the trip, save it to their wish list, or schedule it. When scheduling a meeting the user will specify dates in a popup, and the trip will be added to their scheduled trips. The user can also set filters on each trip.

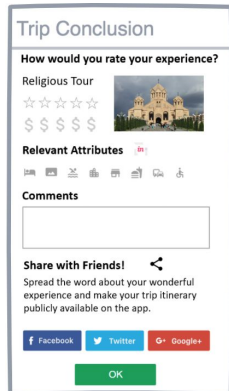
## Trip View



The Trip View will display the sites in the order of the itinerary. Each site will have the image, name of the site, estimated visit time, and a brief description. Before each site, it will show the estimated travel time to reach each site.



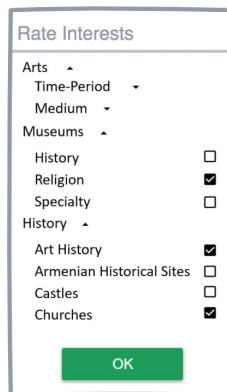
## Conclusion View



After completing a trip, the app will open the Conclusion View where they are rate the trip and provide comments. This page will also include the option for users to share their trip on social media so their friends can see where they went and learn more about visiting Armenia.

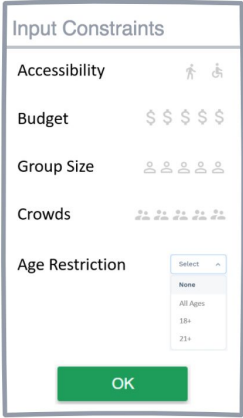
## Trip Builder

### Trip Interests



In this screen the user can select categories of activities they think they would be interested in to build the customized recommendations. If a user has specified interests before, the checkboxes default to the interests input most recently, otherwise the checkboxes start blank. When complete the user can move on to the constraint specifier. Interests would include categories such as art, history, religion, nature, hiking and adventure.

# Constraint Specifier



This screen would allow a user to set constraints for their trip. This would include start and end dates, budget, number of people, and approximately how long they want to schedule for each day. Similar to the Trip Interests, if constraints have been set before, the previous values are set as defaults. If no trip has been set before, or the most recent trip created was in the past, the start date will default to the current date. If the end date is ever before the start date, the end date will be reset to one week after the start date. If the end date is more than three weeks from the start date, the end date is moved to three weeks from the start date. When complete, the user can proceed to the Site Interest View.

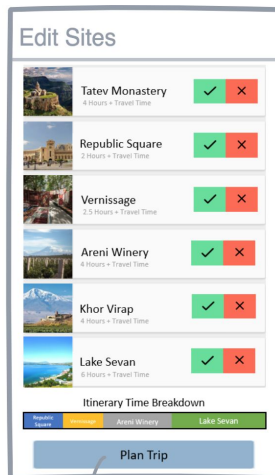
# Site Interest View



The application will use the user's interests, as well as reviews to rank sites and activities the user may be interested in. The application will present the sites to the user one at a time on a card similar to the application Tinder. The card will have the name of the site, an image of the site, and an information button that will lead to the Site View with more information about that site. Similar to the dating application Tinder, the user can swipe right to indicate interest in the site, or swipe left to reject a site. Two buttons on the bottom have the same effect as swiping left

or right. After the user selects or rejects a site, a new card is displayed with the next highest ranked site. This process is repeated until the itinerary is full or the user presses continue, at which point the app moves to the Edit Trip View. The bottom of the screen has a bar indicating how full the trip is, and a continue button for when the user wants to move to the next step.

## Edit Trip View



The Edit Trip View lists all of the sites in a user's itinerary with the estimated visit time and the estimated amount of travel time the site would add compared to if the site were not visited. The sites will be automatically ordered to minimize travel distance. Based on algorithmic complexity, it is not necessary that the ordering is ideal, but it should logically divide activities into different days, and avoid unnecessary travel. The Google Routes Advanced Directions API may be useful for finding the ideal routes. Each site has a switch to enable or disable it from the itinerary. By scrolling down past the active sites, the user can view additional sites which are not in the itinerary that will default disabled. These sites would include sites rejected in the Site Interest View, sites removed in the Edit Trip View, and the next five sites the user would have been shown in the Site Interest View. The bottom of the screen displays an outline of the itinerary indicating the time dedicated to each activity. When the user has completed their trip they can save the itinerary and proceed to the Trip View. If the trip is impossible in the specified timeframe, the user cannot proceed to the Trip View until they have removed enough sites from their itinerary.

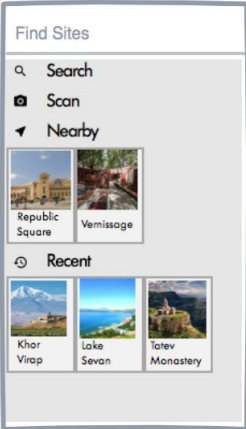
# Site Information

## Site View



The Site View will display relevant information about a site. The top of the view will have a gallery of images of the site that the user can swipe through. Below the images it will list the recommended visit duration, the travel time it adds, and a small map of the area. It will also list ratings from Google and/or TripAdvisor, with a button to read the full reviews. Below the map and reviews the app will have detailed information about the site. This content will be pulled from an online database when planning a trip, but will be stored on the phone to be accessible offline. If there is audio guide content available in the database, this view will also include a play button to listen to the audio.

## Site Finding View



The Site Finding View will have a search bar to search for sites, a function to scan sites, and recommended sites based on the users location, and recent history. The user can search from the database of sites, or search for a place to find sites nearby. The scan function allows the user to scan a QR code relevant to the site. The QR code should be designed to direct people to download the app if they attempt to scan it without the app. Future versions may include the

ability to scan landmarks with augmented reality, but this would not be included in the recommended base product. The nearby sites will already be previewed with a photo and the name of the site, to make it faster for tourists to find information about the site they are at. The app will also preview sites that the user has recently opened in the app, so they can quickly reopen information about the sites they were interested in.

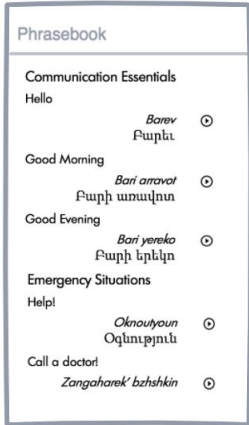
## Travel Utilities

### Find Nearby



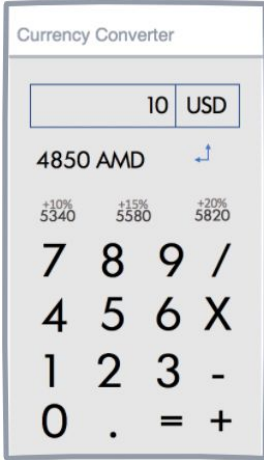
Shows a map of the area with ATMs, restrooms, restaurants, and tourist sites pinned. The user can also filter to just one category by tapping the icons above the map.

### Phrasebook View



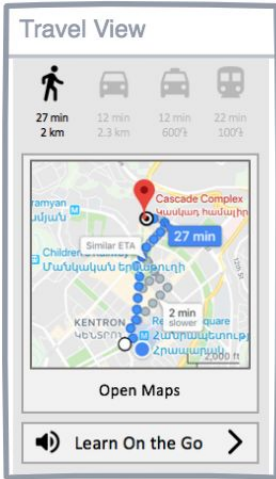
The Phrasebook view will have a set of common phrases, and the Armenian translation written out both phonetically in Latin letters, and in the Armenian alphabet the option to listen to the text in Armenian

# Currency Converter View



The currency converter view has a number entry field, and a result field with a drop down next to each to specify currency. By default the top field is AMD, and the bottom field is selected based on the locale of the device. A switch button swaps the currencies between the input and output fields. The app automatically retrieves the latest exchange rates from the internet.

# Travel View



This view will have information for how to Travel between two sites. At the the top of the screen it will say what two locations it is giving directions to travel between. It will have a map of the route between the sites, with the distance between the listed below it. The app will also give time estimates and travel recommendations, for walking, driving, gg taxi, regular taxi, or bus based on the distance. If the distance is less than a 1 hr walk, it will include the walking time, and distance. If the distance is more than a 5 minute walk, it will also include driving time, as well as the estimated cost of a taxi and information on finding a taxi. If the departing location is within range of gg taxi, it will estimate the price and include a button to open the gg app. If the two locations are in different cities, and there is a known bus between the cities the app can

also include basic information about the bus. If there is an audio guide about the destination, the application would also include a button allowing the user to listen to content while they travel.

## About View

This page will explain the intent of the app, as well as give credit to the organizations that made the app possible, such as the AGBU, AGBU AVC, BSSRC, AMAP, and the developer.

# Other Functionality

## Languages

The app will eventually work in the seven languages from the AVC ebooks (English, Western Armenian, Eastern Armenian, Russian, French, Turkish, and Spanish), but may only be in English and Armenian at roll out. The app would display as much content it can find in the user's preferred language, and display other information such as reviews either in the original language, or translated through Google Translate but this would not be expected in the recommended base product. It may make the most sense for the initial release to include two or three languages known to the developer to ensure language selection functionality. The AVC could then provide the remaining translations after the initial release.

## Content Management

The developer does not need to provide any of the content for the app, but does need to build a resource that would allow people without technical experience to add or modify content to the app's database. This database would include pre-built itineraries, audio guides, images, and plain text descriptions of sites. At a minimum this may be access to a database such as firebase with the ability to upload files and edit JSON data. Depending on cost, the ideal would be a full web portal with html forms to enter or edit site data with different accounts who would have access to different sites but this is not expected in the recommended base product.

## Links To Open Sites in App

It should be possible to scan a QR code or click a link that would open information about a specific page in an app.

## Offline Access

Once a user has saved an itinerary, all relevant images and static maps should be saved to the device to access offline.

## Web Interface

There should be at a minimum a simple website to explain the app and direct people to download it. A complete website with the full functionality of the application would be heavily considered if it does not add significantly to the cost.

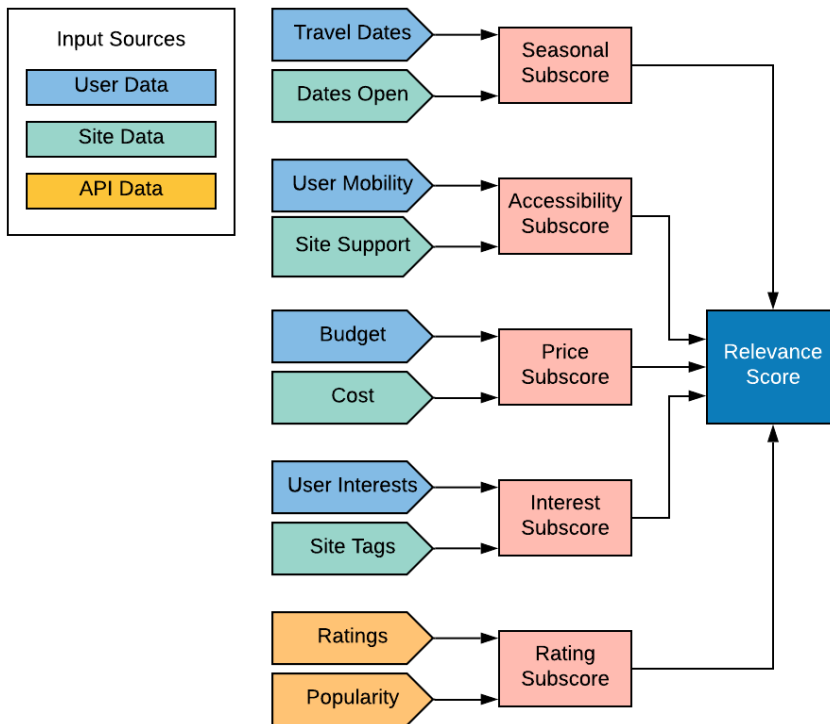
## Distance Estimation

The application should be able to estimate the distance between sites, and group nearby sites that should be visited without relying on excessive Google Maps API calls. The estimates do not need to be precise, but should be enough to make logical suggestions of which sites are easy to visit together. These estimates would be used to determine the order and duration for trips while planning, but the Google APIs should be used for the exact times of a finalized itinerary. The specific algorithm to make these estimates is up to the developer, but we recommend using a subset of the following strategies.

- For each site store the time to sites that are often visited together (eg Garni and Geghard). This could be manually entered, or stored from Google API calls.
- Building a simple graph of the major highway network
- Store the GPS coordinates of sites to estimate direct distance between nearby places
- Categorizing sites by Marz, and suggesting sites from the same Marz together

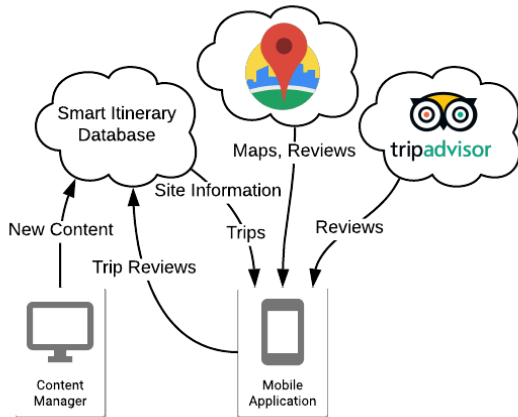


## Site Interest Matching



The process is broken into two main steps: comparing user interests and constraints to the site data to generate subscores, and combining the subscores into a final relevance score that represents how likely the user is to want to visit the given site. The subscores represent how well the site meets each of the users constraints. For example if the user indicated they were interested in history and religion, an old monastery would have a high interest subscore. If the user indicated they wanted a low budget trip, an expensive winery tour would have a low price subscore. After the subscores are calculated they are combined into a final relevance score. If any of the subscores are disqualifying such as the site not being open during the user's visit, the relevance score would automatically be zero to prevent the site from being recommended. If there are no disqualifying subscores, the relevance score will be the product of the subscores. This will ensure that the recommendations factor in all of the user's preferences and constraints. The sites with the highest relevance scores are suggested to the user, who can then decide which sites they want to visit in the Site Interest View.

# Content Sources



## Reviews

We conducted a survey that indicated that ratings and reviews were the most important information to users. As we want access to a full set of reviews from release, the application should include ratings and reviews of sites from the Google Places API and display ratings from TripAdvisor using the TripAdvisor. To avoid paying for the full API the app may show the star ratings, and link to view the full reviews on Google or TripAdvisor.

We also want to collect feedback from the users on the complete tour after they completed their trip. This includes star ratings, ratings of how well it fit their constraints, and comments to inform future visitors. This data will also help the team curating content and designing future versions improve the application.

## Site Information

The site information included in the application will primarily be from the AVC ebooks, and may also include other content sources such as the [Black Sea Silk Road Corridor](#) and [Armenian Heritage](#) programs. The AVC currently has an [Exploring Yerevan](#) ebook with many materials such the phrase book, and an ebook on [Vayots Dzor](#), but is working on ebooks for each remaining Marz and would like to add content to the app as they complete the ebooks. The content management system should allow for adding all the existing content, as well as adding new content as it is created.

# Cost and Benefit of Feature Sets

This section discusses groupings of features that were considered in the design process and how we evaluated them by the development complexity, necessary content, and the value they would add.

## Simple Guide App

Effectively reformat ebook content into app form. App allows users to select from pregenerated itineraries, with existing content about each site, and general guidebook information from ebook. This would be comparable to many apps on the market, but would be distinguishable by better content.

### Content Required

Existing guidebook information from ebook. Potentially more content from Black Sea Silk Road Corridor (BSSRC). Additional content for further outside Yerevan would help promote rural tourism.

### Development Complexity

App only involves simple navigation. Anyone who has ever made an app could make a simple barebones version. The most complex element would be an interactive map with the sites in an itinerary.

### Value

We identified a large deficit of digital content and information that can be easily discovered. This could allow tourists, particularly millennials who look for digital content, to get more out of their visits.

## Basic Utilities

This would include simple features that could be easily integrated such as a tool for finding dining services, a phrasebook, and a currency converter.

### Content Required

All these features are easily implemented with existing content or apis.

## Development Complexity

None of these would individually involve much work for the developer to implement, but each is one more feature to implement and test which could lead to an increased cost.

## Value

This could add convenience, making the tourist experience more enjoyable. These features were some of the most popular in our survey of 125 respondents. Both a dining locator and currency converter had roughly 60% of respondents list them as 'very important' or 'extremely important' features for a travel app.

## Cost Estimation

This would involve estimating the cost of different itineraries. It could include gg taxi cost estimation, cost of museum entry, guided tour costs, student / senior discounts and more.

## Content Required

The biggest challenge with this is gathering data on the cost of different activities. Museums often have complicated pricing schemes depending on age, academic affiliation, etc. The challenge becomes that calculating the sum is only useful if the cost of every single activity is known.

## Development Complexity

Looking up and summing costs is a fairly simple task. Additionally, estimating the cost of gg taxis should be fairly simple.

## Value

After personal interest, our survey identified budget as the second biggest factor in planning trips, so people would definitely value an app that takes budget into account. Additionally, most existing apps either do not do a great job showing overall costs, or focus on selling expensive tours. An app made by a non-profit that understands the needs of a low budget traveller could significantly improve the experience for many travellers.

## Custom Itinerary Generator

User inputs basic interests, and constraints for the app to build a personalized itinerary.

## Content Required

The quality of the product would be strongly correlated to the amount of content included. An extensive database of sites with cost, accessibility, typical visit duration, hours, seasonal interest, etc. would be very valuable. A minimalistic version would just look at a small database and apply basic filters based on interest.

## Development Complexity

Again the effectiveness of the feature would reflect the complexity of the logic. Ideally the app would take into effect many complex factors such as seasons, travel distance, weather, reviews, popularity, etc. This could include numerous APIs to inform the factors, and a complex AI to find the ideal selection and order of sites. A simpler algorithm would simply match listed interests with described traits of different sites.

## Value

Within our own class of 23 people, most people felt they didn't know where to go within the country, and as a result have so far mostly stayed in Yerevan. If an app would make personal recommendations, people would be more likely to see more things, and have a more enjoyable trip to Yerevan.

## Itinerary Sharing

Users can sync their itineraries with members of the group, and share them online for other users.

## Content Required

This is purely a technical challenge.

## Development Complexity

Unlike the preceding features, this would require a server that user data would be uploaded to. This adds something more to maintain and makes development slightly more complicated, but would be necessary for other more complex features as well. Any experienced app development firm would be very familiar with this type of feature. It is worth noting that this is distinct from the simpler task of sharing an itinerary description over social media.

## Value

It could be easier to organize groups, or travel with friends if everyone has access to the same content. It would reduce pressure on the one person with the itinerary on their phone, and

ensure access to resources if a phone dies, or the group separates. Additionally, if people share their trips with friends or on social media it could bring more users to the app, and more people to Armenia.

## Content Curation Portal

This would involve a web interface for people managing the content in the app. From the portal content managers could complete add and edit content such as event descriptions, images, site descriptions, and audio guides.

## Content Required

This make the most sense if there were organizations interested in adding content to the app, but would also help manually adding content from the ebooks.

## Development Complexity

The only change for the app would be the simple requirement of pulling curated from a server, but it would require the development of the web portal for users to manage content. This is again a common task experienced web developers would be familiar with, but would add to the cost of the project. A simpler alternative would be to give content manager a user account for database entry software, but this might be harder for third party contributors.

## Value

This tool could make the process of adding content to the app far more time efficient, and could potentially reduce the overall cost of the project. Additionally, with the ability for more people to easily add content to the app, the app could grow a far richer database of content that is useful to tourists. If museums or other organizations maintaining sites use the app to build the tourist experience of their sites, they are more likely to promote the app to tourists at their site.

## QR Integration

This would involve having QR codes at sights that would install the app if it is not already on the phone, or open the app to a page with relevant content.

## Content Required

This would require QR codes installed at different sites around Armenia, and would require content to open for each site with a QR code.

## Development Complexity

URL redirects and QR scanning are all fairly simple so this would not be technically difficult to implement.

## Value

QR codes would make it easy for users to find the content for where they are, indicate to existing users that there is content for where they are, and demonstrate to potential users that there is an app with content relative to the site.

## Augmented Reality Identification of Sites

A user could point their phone at something identifiable such as the front of a building, or a monument. The app would then identify where the user is and display relevant content.

## Content Required

This would not require QR codes installed at the sights, but would still require content worth displaying. This would also require a dataset of images of each sight to train the AI.

## Development Complexity

There are tools to make development of this type of tool simpler, but it is still not something many developers would have experience doing. Tumo already teaches workshops on TensorFlow, so it should be possible to find developers within Armenia who are familiar with how to implement this.

## Value

Unlike the QR codes, it would not be obvious what sites even have content, but it would still make it easy to find and check for content when at a sight. Additionally, the impressiveness of the technology could make the app stand out, and excite users about using the app similar to how snapchat's intelligent camera filters helped boost its popularity.

# DEMO VIDEO

Link to Demo: <https://youtu.be/FqNK9DluwhA>

Link to Curation Demo: [https://youtu.be/bEhmW\\_FVU5M](https://youtu.be/bEhmW_FVU5M)



# FINAL PRESENTATION

Smart Itinerary Final IQP Presentation:

<https://docs.google.com/presentation/d/1LJlpM8w7aVwRv81Z6Un3CrE6x3pKV0cnnuS71Rv0sk/edit?usp=sharing>