Life Mobile Application

FEATURE PROPOSAL: Location Based Services Module

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**Version 1.0**

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# Document Control

## Change Record

|  |  |  |  |
| --- | --- | --- | --- |
| Version | Date | Author | Changes |
| 1.0 | 01-25-15 | Colin Man | Draft following overview + description |
|  |  |  |  |
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|  |  |  |  |

## Definitions

|  |  |
| --- | --- |
| Term | Definition |
| LMA | Life Mobile Application |
| LBS | Location Based Services |
| POI | Points of Interest |
|  |  |
|  |  |

Note: “LMA” is consistently used throughout all documents as the name of the mobile application, although it is understood that another name will be chosen for branding purposes.

# Component: Entertainment

## Navigation

The navigation portion of all components in LBS should allow for easy switching between components as well as modules within LMA. As such, there must be links or buttons that allow for one or two-tap navigation to the following (there need not be a link to the currently running module, depending on the UX/UI design, though having one would most likely benefit the user experience):

* **Home** – The main screen of LMA. Allows the user to easily return to the starting point and re-launch any application or service that he chooses with the LMA launcher.
* **Discovery** – Links to the “Discovery” component of LBS. See “Component: Discovery” for more details.
* **Maps** – Links to the “Maps” component of LBS. See “Component: Maps” for more details.
* **Lists** – Links to the “Lists” component of LBS. See “Component: Lists” for more details.
* **Scheduler** – Links to the “Scheduler” component of LBS. See “Component: Scheduler” for more details.
* **Entertainment** – Links to the “Entertainment” component of LBS. See “Component: Entertainment” for more details.
* **Tools** – Links to the “Tools” component of LBS. See “Component: Tools” for more details.
* **Security** – This should only appear when the security index of the area is determined to pass a certain threshold. If it does pass the threshold, the user should be able to access this module with one tap, otherwise it need not be so accessible, but should still be available through the home screen.

## Overview

The “Entertainment” component of the “Location Based Services” module is currently composed of three main features:

* Suggested Music – Suggests music to users according to their music profile and friends’ music suggestions.
* Shared Pictures – Shares pictures to users’ social networks through a variety of social media platforms.
* Friend Finder – Locates users and finds friends or other social network members in the area for meet ups and gatherings.

The component also includes a variety of other smaller features that integrate it more fully with the “Social” module. This component integrates with LBS as well as the “Social” module of the “Life Mobile App” to provide a seamless experience for the users whether the users are using LMA at home or on the go throughout the day.

## Purpose

The goal of the “Entertainment” component is to facilitate the creation of a stronger, more connected social network for the users by integrating a variety of social media and entertainment features.

For the ease of the users and to make the interacting with social media a more fluid process for the users, the component consolidates these features into a centralized application. The component as it relates to the LBS module will focus more heavily on the following features:

* Suggested Music – Makes new music suggestions to users based on their music profile and friend suggestions.
* Shared Pictures – Preserves users’ memorable moments by allowing their pictures to be shared across various social media platforms.
* Friend Finder – Locates friends in the area that the users pass by through to facilitate the arrangement of friendly gatherings.

These features and their function specifications are outlined in detail below. The “Entertainment” component as it relates to the “Social” module of LMA will have a broader range of features, but as they do not interact as closely with LBS, will be discussed more briefly in the following feature descriptions.

## Feature: Suggested Music

The Suggest Music feature allows users to access music that they have previously compiled. It also suggests music to users based on their current music profiles, and consolidates friend suggestions for user review. The feature aims to facilitate user access to music and broaden user music taste and sampling.

The Suggested Music feature within the Entertainment component as it relates to LBS has several goals:

1. **User Preferences** – Customizes music access for users to make it easier for users to access their music, whether at home or on the go.
   1. Playlists/Folders **–** Keeps track of the music preferences of the users so that the users can access their preferred music from any location. Users can categorize and sort their music into various playlists and folders for their convenience.
   2. Access Options – Allows users to either select music tracks or randomly shuffle through their available playlists or music library.
   3. Automatic Synchronization – Automatically syncs any new additions to users’ music libraries, so that new music is made available immediately to the convenience of users.
   4. Visibility/Privacy – Allows users to control who can see the music that they have listened to. Also enables users to choose to who to make their playlists available to. Visibility/privacy settings can be set by users for each playlist or on their music library as a whole. Settings include:
      1. Private – The highest level of privacy, playlists with this setting are only visible to the user.
      2. Friends – Available to immediate friends, these playlists are visible to friends from the selected media platform or platforms (the platforms from which friends are determined is also set by the user).
      3. Friends of Friends – Available to a wider range of friends, this setting allows users to share with a more public audience without compromising their sense of privacy if they wish it. As with the Friends setting, users determine the social media platform(s) that the friends and friends of friends are from.
      4. Public – The lowest level of privacy, playlists or music libraries of this setting are visible to the public.
      5. Custom – This setting allows users to determine on a case by case basis who they wish to share their playlists or music libraries with. Multiple custom options can be created and saved so that the user can easily choose between previously set privacy options.
2. **Music Suggestions –** Facilitates the sharing of music between users who are members of the same social network. This exposes the users to a variety of music, allowing them to comfortably remain in their own musical element while experiencing and sampling music from their friends.
   1. Music Preference Profile – From users’ frequently listened-to tracks and playlists, the feature generates music preference profiles. These preference profiles determine what music to recommend the users. After consolidating friend music suggestions, the feature attempts to match the music suggestion to the user music preference profile. If the music suggestion is a good match, it is placed near the top of the list of suggestions offered to the user. The user music preference profile is determined through many factors, some of which are listed below:
      1. Age – The algorithm matches music to users that other people their age have enjoyed.
      2. Previous Favorites – Compiles previous music favorites and matches music tracks with strong correction to those music favorites.
      3. Genres – Matches music suggestions from genres that users have particularly enjoyed before.
      4. Top Playlists – Matches music suggestions that have in general done fairly well with the public.
   2. Friend Music Suggestions – Allows users to receive music suggestions from friends, but also allows users to share any music that they have particularly liked. The sharing of music can be done either privately, through some medium of private messaging, or in general to a social media platform. These settings for sharing can also be customized to various levels of privacy:
      1. Private – The highest level of privacy, playlists with this setting are only visible to the user.
      2. Friends – Available to immediate friends, these playlists are visible to friends from the selected media platform or platforms (the platforms from which friends are determined is also set by the user).
      3. Friends of Friends – Available to a wider range of friends, this setting allows users to share with a more public audience without compromising their sense of privacy if they wish it. As with the Friends setting, users determine the social media platform(s) that the friends and friends of friends are from.
      4. Public – The lowest level of privacy, playlists or music libraries of this setting are visible to the public.
      5. Custom – This setting allows users to determine on a case by case basis who they wish to share their playlists or music libraries with. Multiple custom options can be created and saved so that the user can easily choose between previously set privacy options.
   3. Other Music Suggestions – In addition to music suggestions by users’ friends, the feature is also able to select the music tracks that best fit the user profile and offer a list of the best matches as music suggestions for the users.
3. **Location Based Music Suggestions –** Determines the location of users and consolidates the top playlists of the area before suggesting a sample of these playlists for user consideration.
   1. Genres – The feature will suggest music tracks from genres similar to the users’ music preferences, as well as some music from different genres to expand user music taste. Some of these may be:
      1. Classical
      2. Country
      3. Rock/Heavy Metal
      4. Pop
      5. Jazz

The feature will also consider the top playlists and greatest hits playlists more heavily when making suggestions to users.

* 1. This Suggested Music feature is most integrated with the LBS module. The feature allows users to experience local music culture and broaden their cultural knowledge. As with the friend music suggestions, the local top playlists are parsed so that the music suggestions that match the music preference profile of the user are placed at the top of the feature for user convenience.
     1. Music Timeline – Generates a music timeline and map to keep track of the music that users played most frequently at various times and locations. The music timeline is a map of a trip labeled with major travel stops and frequently listened music tracks.
     2. Integration with Social Module – Users can share the map with friends and family across social media platforms.

## Feature: Shared Pictures

The Shared Pictures feature within the Entertainment component strives to integrate social media seamlessly into users’ daily activities. The feature aims to increase network connectivity through sharing experiences in the form of visual media.

The Shared Pictures feature within the Entertainment component as it relates to LBS has several goals:

1. **User Preferences** – Customizes inflow and outflow of visual media for users to allow users to make choices about the level of connectivity they wish to share with their social network. Facilitates targeted sharing of pictures and other forms of visual media.
   1. Albums **–** Allows users to categorize and sort their pictures into various albums and folders for their convenience. Users can choose to group pictures by one or more of the following details:
      1. Date/Time – Keeps chronologically close pictures together, which is ideal for grouping pictures of individual events.
      2. Location – Groups pictures by the location tagged in the photos.
      3. Subject Matter – Like Location, can consolidate photos of similar content over various time periods and locations.
      4. People – Groups pictures by the people tagged in the photos.
   2. Automatic Synchronization – Automatically syncs any new pictures taken users’ unsorted picture collection so that the new visual content can later be sorted or shared at the users’ convenience.
   3. Visibility/Privacy – Allows users to control who can see the pictures or visual content that they have uploaded or has been synced to their account. Also enables users to choose to who to make their albums available to. Visibility/privacy settings can be set by users for each album or on their visual content as a whole. Settings include:
      1. Private – The highest level of privacy, albums with this setting are only visible to the user.
      2. Friends – Available to immediate friends, these albums are visible to friends from the selected media platform or platforms (the platforms from which friends are determined is also set by the user).
      3. Friends of Friends – Available to a wider range of friends, this setting allows users to share with a more public audience without compromising their sense of privacy if they wish it. As with the Friends setting, users determine the social media platform(s) that the friends and friends of friends are from.
      4. Public – The lowest level of privacy, albums or visual content of this setting are visible to the public.
      5. Custom – This setting allows users to determine on a case by case basis who they wish to share their albums or visual content with. Multiple custom options can be created and saved so that the user can easily choose between previously set privacy options.
2. **Visual Timeline –** Compiles pictures and visual content from the users’ accounts to create a visual timeline to commemorate a period of time as determined by the user. The timeline includes some of the following customizations:
   1. Time Period – The user can choose the beginning and end dates of the visual timeline to create. The time period set by the user constrains the visual timeline to content only posted from that time.
      1. EX: At the beginning of a new year, a user may choose to make a visual timeline commemorating the year before by constraining the timeline between the beginning and end of the last year.
   2. Content – The user can constrain the content of the visual timeline with the following options:
      1. Location – Focuses on the pictures from the location specified.
         1. EX: All of the pictures from a summer camp.
      2. Subject Matter – Focuses on the pictures from the specified album.
         1. EX: Nature scene pictures from a camping trip.
      3. People – Focuses on pictures that are tagged with the person specified by the user.
         1. EX: Pictures of the user and user’s best friends.
   3. Visibility/Privacy – Allows users to control who can see the visual timeline created. Users can specify visibility/privacy settings to share timelines privately or selectively to a group of friends. Settings, as with other visual content, include:
      1. Private – The highest level of privacy, visual timelines with this setting are only visible to the user.
      2. Friends – Available to immediate friends, these timelines are visible to friends from the selected media platform or platforms (the platforms from which friends are determined is also set by the user).
      3. Friends of Friends – Available to a wider range of friends, this setting allows users to share with a more public audience without compromising their sense of privacy if they wish it. As with the Friends setting, users determine the social media platform(s) that the friends and friends of friends are from.
      4. Public – The lowest level of privacy, timelines of this setting are visible to the public.
      5. Custom – This setting allows users to determine on a case by case basis who they wish to share their timelines with. Multiple custom options can be created and saved so that the user can easily choose between previously set privacy options.

## Feature: Friend Finder

## Other Features

## Use Cases

### David

David is a 70 year old elderly man who has recently discovered LMA as a way to manage the many confusing options that modern technology has to offer. David loves classical music and recently started compiling a playlist on LMA. His music shows up in a playlist folder named “Classical”, and when he clicks into the folder, he can access all the pieces he has already placed inside.

The next time he opens the Entertainment tab of LMA, LMA analyzes David’s music preferences and discovers that David is an avid classical music fan. A suggestions box pops up and suggests two more classical pieces for David to sample, Vivaldi’s *Four Seasons* and Pachelbel’s *Canon in D major*. David immediately takes the suggestions and listens to both pieces, instantly falling in love with both. He then adds these two pieces into his Classical playlist as well. LMA notes that David added both pieces and adds this information to David’s profile.

Now, every time David opens up LMA, he looks forward to trying new beautiful classical pieces. LMA continues to analyze and keep track of David’s preferences as David increases the size of his music library.

### Lisa

Lisa is a college student who is going to study abroad this quarter in Beijing, China. She has taken an introductory Chinese class, but is still a stranger to the nuances of the language. Upon arriving at the airport, she is swept away by the rapid fire Chinese spoken around her and feels lost.

Lisa opens LMA to listen to some music while she waits for her host family to pick her up. Upon opening the Entertainment tab, she is greeted with a suggestions box with several Chinese pop songs. LMA had determined her location and compiled a list of local music for her to try out. Lisa took a look at the first few selections in the suggestions box. One of the songs was a piece by famous singer Jay Chou. She realized that she had seen his name before in her Chinese class and that the style of his music closely matched her own favorite English songs. Lisa was easily able to while away the half hour before she was picked up from the airport by her host family.

After two months in Beijing listening to all types and varieties of Chinese music, both traditional instrumental, operatic, and pop, Lisa gained a much better understanding and appreciation for Chinese culture. Lisa came away from her study abroad experience with a great deal more fluency in Chinese thanks to LMA’s location-based music suggestions.

Figure 0.0.0. – David

Figure 0.0.0. – Lisa

# Component: Safety

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## Overview

The “Safety” component of the “Location Based Services” module is currently composed of three main features:

* Safety Index – Calculates a safety index based on a number of factors for the immediate area of the user’s location.
* Auto-Dial – Safety feature that notifies police and/or behaves as an alarm if the user feels threatened.
* Location Broadcasting – Broadcasts user location to a set of predefined contacts as the user travels through a potentially dangerous neighborhood.

The features of the “Safety” component also interact to a small degree with the “Social” module; in particular, the Location Broadcasting feature utilizes users’ social networks to ensure their safety in the event of an insecure area.

## Purpose

The purpose of the “Safety” component is to improve user safety when the user is traveling, especially through unfamiliar areas. The “Safety” component interacts with both LBS and the “Social” module to create a comprehensive evaluation of the safety of an area so that users can make informed decisions when entering a new area. The “Safety” component also offers safety services to users so that they can receive help quickly and promptly in the event that they do need help.

To ensure that users make informed decisions about their safety as they go about their daily tasks, the component focuses on the following features for its main functionality:

* Safety Index – Calculates an index for the area that user is in, which falls into one of five safety classifications.
* Auto-Dial – Allows users to obtain help quickly if they fall into unsavory situations.
* Location Broadcasting – Creates a safety net out of users’ social networks so that in the event that a user cannot auto-dial or otherwise call for help, those in their network can obtain help for them.

These features and their function specifications are outlined in detail below. Some of the features have some small ties to the “Social” module and these integrations are also described in detail.

## Feature: Safety Index

The Safety Index feature aims to help users make an informed decision when deciding whether or not to enter an unfamiliar area or situation. The Safety Index is calculated by examining multiple factors that users may find useful or important to their decision-making. Some of the factors are as follows:

1. **Safety Index** – The Safety Index is a weighted index calculated by assigning values to different crime statistics and other data.
   1. A higher safety index indicates that an area is relatively safe to stay in, while a lower safety index cautions users to avoid the area if possible.
2. **Crime Rate** – The feature looks at the recent crime rates of the area, including both violent crimes and property crimes. After looking at these crime statistics, the feature calculates their contribution to the final safety index.
   1. In terms of their contribution toward the safety index, violent crimes cause more severe deductions from the safety index than do property crimes, since the algorithm prioritizes the user’s personal safety over the safety of the user’s belongings.
   2. Time – Crime statistics are weighted differently depending on how recent they are.
      1. Crime statistics from more than ten years ago are discounted heavily, since they may no longer reflect the current criminal climate of the area.
      2. Recent crime statistics are more closely examined. If recent crime statistics are not available, older crime statistics will take on more weight in the safety index calculation than they usually do.

1. **Sex Offenders** – This feature examines the registered sex offenders listed for the area and calculates the contribution to the safety index.
   1. The algorithm takes into account both the number of offenders and the severity of their crimes.
      1. EX: Someone who is a registered sex offender for a public indecency charge will cause a minimal decrease in the safety index, while the incidence of serial offenders in the area can seriously penalize the safety index for that region.
2. **Housing Costs** – Housing costs are also calculated toward the safety index, though they carry less weight than criminal statistics.

* 1. Generally speaking, neighborhoods where housing prices are high tend to be safer. The feature has pre-calculated median housing prices by county. If the neighborhood housing prices fall above the median, it results in a positive contribution to the safety index (is considered safer).
  2. Similarly, if the housing prices of an area fall below the median, it results in a decrease in the safety index (the area is less safe).

1. **Wealth Distribution –** In addition to calculating just the median housing prices for each region and the housing prices of the area the user is in as compared to the median, the feature also calculates two statistics to determine the distribution of wealth.
   1. Assumptions – The feature assumes that a more equitable distribution of wealth if generally correlated with a safer neighborhood.
   2. Housing Prices – Calculates the distribution of housing prices in the region by computing the variance of the housing prices. A large variance indicates that housing prices fluctuate by a significant amount throughout the neighborhood and causes a decrease in the safety index. On the other hand, if variance is low among the housing prices, the safety index increases.
   3. Income – Calculates the distribution of income in the region by calculating the variance of people’s salaries. As with housing prices, a higher variance indicates that the area is less safe and causes a decrease in the safety index.
2. **Time** – The previous few factors have all been relatively static in that they looked at historical data on the region. The time factor of the safety index calculation examines the crime rates for the area and determines the times of day that are more common for criminal action.

* 1. By taking the user’s time into account, the safety index feature can more realistically provide feedback before the user decides whether or not to proceed with traveling through the area.

1. **Safety Suggestion** – After consolidating a wealth of information regarding the safety of the area that the user is in, the feature assigns the safety index a safety rating from 1 to 5, where 1 is a very innocuous, after which the user makes a decision whether or not to stay and proceed in the area. The possible safety ratings and their meanings for the user are listed below.
   1. Rating 1 – The neighborhood is very quiet. There are few, if any, crimes this year.
   2. Rating 2 – The neighborhood is still fairly quiet, and perhaps requires slightly more caution from the user, but is still relatively safe to travel through.
   3. Rating 3 – The neighborhood’s median crime rate means that it should behave much the same way as most cities. User discretion is advised if it is fairly late in the day.
   4. Rating 4 – The user is in a fairly dangerous area of and must remain vigilant if the user plans on entering the danger zone. If it is too late in the night or very early in the morning, the feature will recommend that the user skirt the edges of the danger zone.
   5. Ration 5 – The highest rating for danger in the area. The feature will definitely caution the user to go around the area, especially if the user is traveling at an odd hour.

## Feature: Auto-Dial

The Auto-Dial feature enables the user to request and receive immediate aid if the user is feeling threatened. The Auto-Dial feature relies on the following concepts:

1. **User Proactive** – The most important concept behind the Auto-Dial feature is that the feature is user proactive. This means that, in a situation where the user feels endangered or threatened, the user must take action in order to activate the services that Auto-Dial provides.
2. **Siren** – The siren functionality of Auto-Dial activates a pre-recorded siren noise. When the user enters a location that is rated dangerous by the safety index, or if the user feels unsafe walking into an unfamiliar neighborhood, the user can press a phone key in order to play the siren noise. The siren noise is activated in the hope that the would-be criminal is scared off by the apparent vigilance of the local law enforcement.
3. **Help Button** – The help button is another remapped key on the user’s phone that directly calls the police when pressed. The key is remapped to the number of the local law enforcement upon the user’s arrival to a neighborhood that has a safety rating of greater than 3 (danger is above median). Users can also choose to manually set the remapping of the key in a neighborhood of better safety rating if they feel uncomfortable or endangered.

## Feature: Location Broadcasting

The Location Broadcasting feature enables the user to receive help by proxy if the user is in a situation where the user can no longer directly require help. The feature is dependent on the following concepts:

1. **User Passive** – The most important concept behind the Location Broadcasting feature is that of user passivity in requesting help.
   1. In the case of Location Broadcasting as opposed to the Siren, when the user is in a situation where the user feels uncomfortable or endangered, the user does not need to take immediate action in order to request aid. Rather, the user simply needs to not do anything.
2. **Safety Net** – Location Broadcasting is built on top of the idea of a safety net. A user’s safety net is a network of people the user trusts to keep the user safe in the case of an emergency or a dangerous situation. The user must first predefine a list of contacts to contact if the user needs help. As the user travels through dangerous areas, the contacts are notified about where the user is.
3. **Broadcasting** – Before the user enters the location, the user sets a certain time limit to the time the user plans on spending within the area. At the end of this time limit, the members of the user’s list receive a prewritten text urging them to contact the police in case the user is now a missing person. It also broadcasts the user’s last known location to the members of the user’s list of contacts
4. **Tethering** – The concept of tethering is that the user is “tethered” between two location points at every point in time as the user is traveling through a dangerous area.
   1. As the user enters the neighborhood, the user’s location is broadcasted to the user’s contact list.
   2. If the time set by the user runs out and the user is not able to disable the timer (and therefore notify the contact list that the user is safe), then the last known location of the user is broadcasted to the contact list as well.
   3. Even if the user becomes separated from the user’s phone, the authorities have at least two points from which to search for the user. In the case that the user still has the user’s phone, the phone will continue to broadcast the user’s location at constant intervals, creating a trail for the police to follow.

## Use Cases

### Gina

Gina is a young woman in her twenties who works as a salesperson. Because of her job, she travels frequently, often through unfamiliar neighborhoods.

One day, Gina ends up at the mouth of an alleyway that the map says leads her to her destination. Having recently discovered the LMA safety index feature, she decides to find the safety index of the alleyway she is about to enter. She opens LMA and goes to the Security tab. The index indicates that the area she is in is most definitely not safe. She is able to pull up crime statistics and finds out that there have been a string of unsolved violent crimes in the immediate area. She instead takes a longer way around the alleyway and reaches her destination safely.

The next day, Gina reads in the news that there was an armed robbery in the very alleyway that she had avoided the day before.

### Mark

Mark has recently wed his childhood sweetheart, Emily. The two of them are looking to find a play to settle down and raise their family. Mark and Emily recently found a house they really liked in the suburbs. To make sure that the house they wanted was in a safe area, Mark pulled out his phone and opened LMA to the Security tab.

A quick security check of the immediate surroundings reveals that there has only been a total of three crimes in the past decade, all of them property crimes, not violent crimes. Further investigation shows Mark that the distribution of wealth in the neighborhood is fairly equitable and that all of the families are young, atomic middle class families.

With this information under his belt, Mark is able to make an informed decision with his wife about the house and they move in the house the following month.

Figure 0.0.0. – Gina

Figure 0.0.0. – Mark

# Component: Scheduler

## Navigation

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## Overview

The “Scheduler” component of the “Location Based Services” module is currently composed of two main features:

* Efficiency Task Scheduler – Efficiently schedules tasks into a schedule given task duration and the distance in between/transition time between tasks.
* Automatic Itinerary Generator – Determines

The features of the “Safety” component also interact to a small degree with the “Social” module; in particular, the Location Broadcasting feature utilizes users’ social networks to ensure their safety in the event of an insecure area.

## Purpose

The purpose of the “Safety” component is to improve user safety when the user is traveling, especially through unfamiliar areas. The “Safety” component interacts with both LBS and the “Social” module to create a comprehensive evaluation of the safety of an area so that users can make informed decisions when entering a new area. The “Safety” component also offers safety services to users so that they can receive help quickly and promptly in the event that they do need help.

To ensure that users make informed decisions about their safety as they go about their daily tasks, the component focuses on the following features for its main functionality:

* Safety Index – Calculates an index for the area that user is in, which falls into one of five safety classifications.
* Auto-Dial – Allows users to obtain help quickly if they fall into unsavory situations.
* Location Broadcasting – Creates a safety net out of users’ social networks so that in the event that a user cannot auto-dial or otherwise call for help, those in their network can obtain help for them.

These features and their function specifications are outlined in detail below. Some of the features have some small ties to the “Social” module and these integrations are also described in detail.

## Feature: Efficiency Task Scheduler

## Feature: Automatic Itinerary Generator

## Wireframe Form Layout