**Analysis of Route Planning Softwares &**

**Suggestions For Pakistani Environment In Context of AI**

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# Abstract

The objective of this analysis is to compare different free commercial and commercial route planning utilities in the context of the features they offer to their users. On the basis of the demand in the industry, I have selected five best route planning tools and prepared a comparative analysis on the basis of advantages and disadvantages. At the end of this report, I have enlisted some innovations including suitable rental-house recommendation, nearby mobile-balance provider, and more that can be integrated in the already built tools to avail users. In addition, we have discussed some requirements and challenges in the context of Artificial Intelligence that must be catered.

# Route Planning Softwares

## Waze

Why would even someone need another map application, if Google Map is there to help people who are looking for directions. Following are the features that force the business community to have this utility.

1. In a dynamic environment, it can adapt quickly and ensure the fastest possible route.
2. It allows the facility of finding community recommended places.
3. Users can search for nearby gas stations to save fuel cost.
4. Moreover, it constantly collects users data and provides them with the perfect route for their routine traveling.
5. You can even connect it with your spotify account.

The overall rating of Maze on [autoexpress](https://www.autoexpress.co.uk/product-group-tests/96376/best-online-route-planners-2020) is 4.5 stars. After having a look at a number of reviews, I have found the following problems with this app:

1. Complex procedure has to be followed if you want to create directions from places other than your current location.
2. No true offline map options.
3. The main issue that I have personally noticed is its ugly and cluttered layout of the maps.
4. Another complaint that users have against Waze is the amount of battery power and data resources it consumes.

## The AA

Following benefits can be availed via this app:

1. Voice-over and detailed written information for step-by-step directions.
2. Give updates regarding real-time traffic.
3. You can search for nearby hotels, gas stations, car parks, and other public service places.
4. Special packages for fuel efficient transportation services.
5. It works faster than other alternatives.
6. Unlike other apps, it finds the most convenient route instead of the fastest one.
7. Calculate an approximation for distance and time before the journey.

The overall rating of The AA on [autoexpress](https://www.autoexpress.co.uk/product-group-tests/96376/best-online-route-planners-2020) is 3.0 stars. After playing with this software, I believe they still need improvements in the following areas:

1. Too many ads while scheduling a route.
2. Buggy and bad looking user-interface. On some devices, you cannot even adjust departure time.
3. No mobile is available. You can only avail their services via the browser.
4. Since it's only accessible through the browser, no offline map services are available.
5. It does not plan routes for users on bikes, bi-cycles, and even pedestrians.

## RAC

Pros:

1. Get alerted to accidents and dangerous weather.
2. Add live traffic alerts and print instructions easily.
3. The most interesting feature is that it calculates the cost of the journey by entering vehicle details.
4. This app allows pedestrians to plan efficient routes.

Cons:

The overall rating of RAC on [autoexpress](https://www.autoexpress.co.uk/product-group-tests/96376/best-online-route-planners-2020) is 3.5 stars. After playing with this software, I believe they still need improvements in the following areas:

1. It provides the traffic updates but not with the traffic intensity.
2. Only lets users add no more than 10 locations.
3. Not available outside of Europe.
4. Out-dated user interface and bugs in the app.
5. Can search for a limited number of services like car parking, hotels, and dealers etc.

## MapQuest

Pros:

1. You can plan for more than 20 stops (useful service for businesses).
2. Friendly and easy to use interface.
3. Offer turn-by-turn navigation and traffic information.
4. Find the cheapest gas prices.
5. Depicts tried and true technology.

Cons:

The overall rating of MapQuest on [pcmag](https://www.pcmag.com/reviews/mapquest-for-iphone) is 3.0 stars. Following implications are experienced with this tool:

1. Inaccurate stops and directions complaints are reported by drivers.
2. Ads popup are sometimes distracting and bothering drivers.
3. No offline mode is available.
4. Limited database.
5. Occasional quirks for walking directions.

## Maptive

Pros:

1. You can plan the shortest path for unlimited stops (useful for professionals).
2. Users can share maps publicly and securely.
3. Overlay multiple routes and by default suggest the best one.
4. It offers a lot of useful tools including distance, temperature, and cost calculators, etc.
5. A great tool to build custom maps as it provides a lot of customization options.
6. Real-time traffic updates.
7. Sharing options are also available.

Cons:

The overall rating of MapQuest on [pcmag](https://www.pcmag.com/reviews/mapquest-for-iphone) is 3.0 stars. Following implications are experienced with this tool:

1. No mobile application is available.
2. It’s quite slow as compared to other tools.
3. Out-dated user interface.
4. Users have to pay for some professional services.
5. Too many ads in the free version.

# Innovations For Pakistani Environment

In all of the above mentioned route planners, we have noticed that these route planners find the shortest and the most suitable path for the already existing paths. What if someone and specifically the Government wants to construct a direct connection(road) between two locations? According to my research and knowledge, so far no entity explicitly provides such services. By adding features such as finding the shortest path between custom map locations and building a suite of tools to calculate estimated cost for such tasks, a lot of resources, both money and time, can be saved. The main objective of this innovation is to provide the facility of suggesting the best possible routes to be constructed on the basis of given parameters i.e temperature, distance, traffic requirements, material requirement, radius, and many more. Moreover, we can extend this modification by adding an option of suggesting where roads should be constructed in order to distribute traffic and avoid accidents. In addition, rental-house recommendation service, local tourist points, nearby mobile-balance providers, suitable public transportation, carpooling and many other service models can be added.

# Integrations In Car Navigation System

If it’s limited to the extent of the recommendation, yes a lot of services including hotel recommendation, nearby mobile-balance providers, fuel-efficient gas-stations, rental-house recommendation, and many more can be incorporated to avail users. Recommender systems (RSs) are getting importance due to their significance in making decisions and providing detailed information about the required product or a service. Due to the presence of a huge amount of online information, it’s time consuming for a system to recommend the best among the betters. Here comes the role of artificial intelligence. Using different artificial and machine learning models including collaborative filtering, lexical analysis, feature extraction and content-based-filtering, one can fulfill the needs of the potential customers. To train such models, a number of large datasets of related information, both quantitative and qualitative analysis methods, and resources for computational work are needed. While developing such a recommendation system, some of the fundamental challenges can occur. Some of them are as follows:

* How to cater to the scalability challenge with the increase of the data?
* Inability to capture changes in user behavior with time.
* Cold start

# References

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