

Android Auto: Revolutionizing User Interface

U. Mahesh

Department of CSE

Vidya Institute of Science & Technology

Corresponding Author's Email id: - u.maahesh42@gmail.com

Abstract

For years, automobiles are being developed for efficiency and comfort. A huge chunk of funds is spent on Research & Development of cars and engines. Its functionalities have also improved in quality and reach, making riding a luxury experience for the customers. Android auto is one such technology in the making which enables users to operate on a car's dashboard with their android device, mirroring its features. This makes entertainment and passing information fast and easy for the riders across globe.

Keywords: - *Android, Automobile, Navigation Technology, Multimedia, Android Auto.*

INTRODUCTION

Cars have been dominated with infotainment systems that let users control everything from navigation to music and so on. These systems have been in place for a while, especially with modern cars featuring these features on almost all kinds of models from budget to luxury. The interface however tells different story, with users often not understanding how to operate them or even another issue is show moving systems that do not offer a good experience to users. These intricacies result in users just using the in-hand

android systems in four of their smartphones and ditch these complex and time taking car systems.

Companies and app developers have well understood these upcoming areas of development and have put in a lot of work in developing systems and apps that would ease the use of such devices and connect users better with their cars using such interfaces that are easy to operate and do not need fancy equipment.

Google and Apple are well aware of this segment where they can build up a big

market base; both companies announced new in-car systems Android Auto and CarPlay, respectively. This technology uses smartphone for navigation and music, bypassing the car's native user interface. The idea behind both systems is that if drivers are going to be using their phones for entertainment and navigation, they might as well use the displays and controls already built into their cars. And in doing so, Google and Apple can limit the dangers of distracted driving caused by focusing on a phone while behind the wheel.

As of latest trends, Android Auto has started finally rolling out to production of

in house cars of top brands starting with the Hyundai Sonata. Android Auto does not fully replace the Sonata's interface. On the contrary, it essentially runs as an app on top of it, launching when you plug in a compatible phone Android 5.0 or newer, into the car's built-in USB port. It turns the car's infotainment system into the conduit for controlling Google Maps navigation, receiving messages, and playing music or listening to podcasts. It also lets you use Google's voice search from behind the wheel, using the existing buttons and microphones already built into the car.

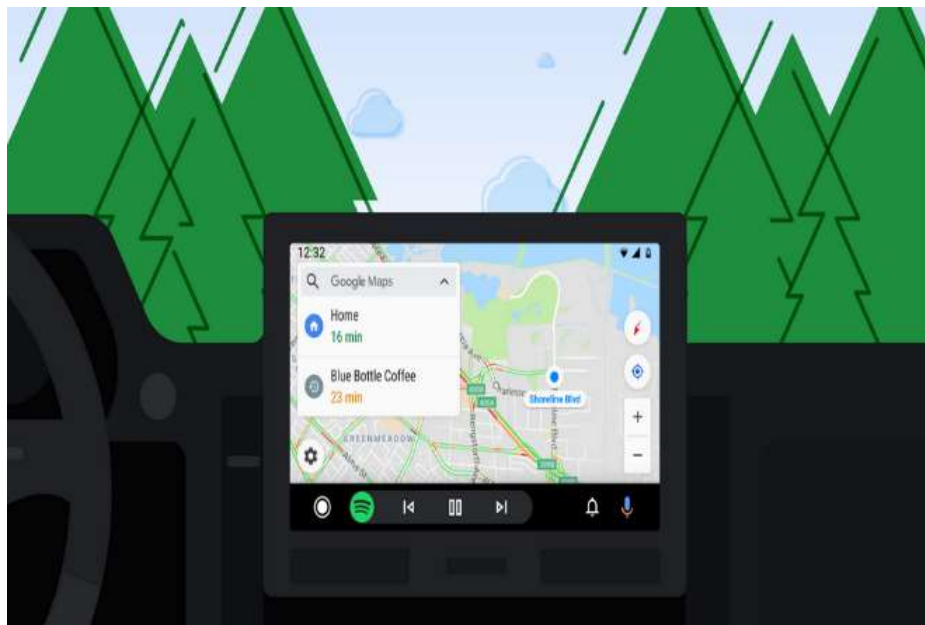


Figure: 1. Source- Google Design for Driving

As of latest trends, Android Auto has started finally rolling out to production of in house cars of top brands starting with the Hyundai Sonata. Android Auto does not fully replace the Sonata's interface. On the contrary, it essentially runs as an app on top of it, launching when you plug in a compatible phone Android 5.0 or newer, into the car's built-in USB port. It turns the car's infotainment system into the conduit for controlling Google Maps navigation, receiving messages, and playing music or listening to podcasts. It also lets you use Google's voice search from behind the wheel, using the existing buttons and microphones already built into the car.

FUNCTIONS & ACCESS

The system has become much more efficient with the use of this technology. Post installment of the app on a phone, you plug it into the car, pair it over Bluetooth, which is fairly simple provided the system is Bluetooth friendly. This is a basic feature and almost all systems provide Bluetooth connectivity. Post connection with Bluetooth, the user has to just push the "Android Auto" button on the touchscreen. At this stage, the phone itself becomes rather since the interface is completely locked out in favor of an Android Auto splash screen. Google wants you to do everything through the car's

controls when you're driving, this would additionally reduce chances of drivers getting distracted.

The user will have to use the touchscreen on the dashboard of the car to operate further, which is still a better alternative for drivers, although it is always advisable to stop the car on the side lane before looking onto the screen and away from the road.

CONTROLLING NAVIGATION ON ANDROID AUTO

There are 5 panes to Android Auto

1. Navigation
2. A phone dialer
3. Information
4. media and music
5. a diagnostic pane

These panes have been designed to most appropriately suit the users' needs and it displays the vehicle's vitals like tire pressure or fuel efficiency so that the user is aware of the car's health and functionality at all times.

Entering in a destination can be done via voice or using an on-screen keyboard when the car is in park, and Google will provide information such as hours of operation and phone numbers for

businesses. One tap on a phone number and you can call a restaurant to place a reservation, with the car acting as a giant speakerphone.

The navigation pane works exactly as one would imagine connecting with the dashboard; it provides you with all of the Google Maps tools available on your phone to get you where you need to go. It has traffic information, points of interest, and a dark mode for night driving.

Android Auto's version of Google Maps compared to what's available on your phone provides the users with all amenities and essentials along with additional music

and entertainment feature. Now since it is a vehicle, the google maps and navigation only provides driving directions, not mass transit or walking. A user is able to choose between an overhead 2D view or a follow behind 3D perspective. Navigation directions are blasted through the car's speaker system, speakers in the center of the dash that's designed to make sure the voice alerts cut through the din of road noise and climate control in some cars make it even more effective. The system will automatically lower the volume of music when providing an audio alert and turn down the air conditioning when it's listening for a voice command.



Figure: 2 Source-Caravan Magazine

Android Auto's dialer pane displays the call log from your phone as well as favorite contacts. Placing a call is as easy as tapping the number from the list, or you can pull up a standard dialer to input phone numbers manually. Additionally, a user can press the voice button on the steering wheel or the Google button in the upper right corner of Android Auto to dial numbers by voice command simply.



Figure: 3 Source- Softpedia, 2021

ESSENTIALS TO ENABLE ANDROID AUTO

Android Auto can easily be used with basic minimal essentials on compatible cars with android device. A checklist is provided below as per the official weblist provided by android.

- An Android phone running Android 6.0 and up with a data plan.
- A car or stereo that's compatible with Android Auto.

- A high quality USB Cable to connect with the system.
- A compatible phone and an aftermarket car stereo from JVC, Kenwood or Pioneer in order to connect wirelessly.

CONCLUSION

Android Auto is a wonderful innovation in the automobile industry. It has enables efficient and seamless use of amenities on car or stereo systems. The technology has solved the problem of complex user interface. With Android auto, a user connects with the car and takes on the functions with the touchscreen and let's go of controls from their android smartphones, making all controls available on the car itself. The setting up of this technology is simple and quick. The essentials required are pretty basic for any individual with a smartphone and a car. The compatibility is an area that needs to be kept in mind provides this is a relatively newer technology and is not universally applicable.

REFERENCES

- I. Strayer, D. L., Cooper, J. M., McCarty, M. M., Getty, D. J., Wheatley, C. L., Motzkus, C. J., ... & Horrey, W. J. (2019). Visual and

cognitive demands of carplay, android auto, and five native infotainment systems. Human factors, 61(8), 1371-1386.

- II. Mandal, A. K., Panarotto, F., Cortesi, A., Ferrara, P., & Spoto, F. (2019). Static analysis of Android Auto infotainment and on-board diagnostics II apps. Software: Practice and Experience, 49(7), 1131-1161.

- III. Seifert D. 2015. Android Auto Review: The Verge. Retrieved from : <https://www.theverge.com/2015/5/26/8659671/android-auto-in-car-system-review-smartphone-hyundai-sonata>