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The Network Challenges Facing on Booking App Taxi Services

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Abstract: Last decade nobody would have thought about the power to hail a cab from our mobile sitting at home - without even talking to a human? It just requires are a few clicks and a cab is ready to pick up from source and drop at the destination. The cab aggregators like Uber and Ola have changed the way we commute. In this paper, we seek to understand the network issues encountered while booking a ride from the two major cab aggregators Uber and Ola using Run charts which is a Quality Control tool.

Keywords: Network, Ola, Uber, Quality Control, Run Chart, Spectrum, Performance

I. INTRODUCTION

Taxi or cab services are present from very long time. Usually people need to wait for a taxi for a long time till the taxi arrives near you. If the taxi is free then you get a ride to your desired destination and if the taxi is occupied you need to wait for some more time till you get a ride. This system of getting a ride is changed by the help of mobile and internet technology. Now in moment you can book a taxi and it arrive at your destination without making you wait on a street looking for a taxi. These taxi services have many types you can opt from non-sharable ride to a share ride and even from auto to luxury cabs. Pick-up and Drop-off is decided by the rider before booking the taxi and its approximate fare is also shared with the rider. There are many players in online taxi services these days but with respect to India there are few major players like Uber, Ola, Meru etc...

Above we have seen that taxi services are the new way to hire taxi services from your door steps. In Last decade there is rise in the use of mobile technology giving new resources and services to the public. Mobile technology enhances the use of internet. Internet is the way of communication. Mobile technology has evolved rapidly over past few years. Mobile makes use of operating system to install and use many application and internet plays an important part in the growth of the mobile technology. The telecom companies give internet as service to the users. Users make the use of the wireless technology to use many applications which are installed into the mobile. Wireless technology in early 1980s 1G as voice only communication. In 1991 2G [900 – 1800 MHz] was developed introducing SMS and mms services.1998 was when 3G [900 – 2100 MHz] was introduced providing high speed data transmission and support video calling and faster internet. 2008 4G [850 – 2300 MHz] was released with more services.

Taxis services and new thing which uses internet as its services where you get taxi at your door step. Being specific to India there are two major taxi services which are popular with the people and they are Uber and Ola.

Uber is founded in 2009 by Travis Kalanick and Garrett Camp it is headquarter in San Francisco, California. Uber's main business is peer to peer ride sharing, taxi cabs, food delivery and other services. The company is in operation is more than 785 metropolitan areas worldwide. Its uses platform like website and mobile application to access their services. Similarly, there is Ola which is a home-grown company from India founded in 2010 by Bhavesh Agarwal and Ankit Bhati. Ola's main business is peer to peer ride sharing. Its operative in almost 169 cities in India and now getting its hands on Australian and New Zealand market from September 2018 and also has its presence in United Kingdom. The services Uber and Ola gives from these platforms that the user can book his/her cab or ride from its current location and the cab will directly come to the location and gives you the ride to the desired location and price it according to the total distance travelled and the time taken to arrive to the destination.

II. LITERATURE REVIEW

In this paper we are going to go through the issues related to the network and other issues that are encountered when the services are used by the user from the web portal or mobile application.

When the user uses services like Uber or Ola from its web portal is only issue that can be encountered is the network speed and delay in the response from the server. The first time the site is loaded the longest time recorded to launch and service, once its in the cache memory the use becomes faster. Network speed is the only reason for its faster access and its failure. Below are few issues that we have come across when web port was in use.

A. Network speed depending on the tariff used.
B. Download and Upload Speed of the network.
C. Use of Hot Spot or Wi-Fi connection.
D. Server response.
E. Memory usage of the computer.

When is user uses its Services from Mobile application there are many factors that can be analysed to the performance of the application. Where the main issue which we are tracking is the internet services with other issues which can be tracked with the use of application. Below are few issues which we have come across during the research.

1) Location
2) Range
3) Frequency
4) Network Traffic
5) Upload Speed
6) Network Card
7) Download Speed
8) Processor used
9) Cache History
10) Cache Used
11) Memory Used
12) Telecom Card
13) Cell Antenna
14) Maps
15) OS

In mobile technology we generally use the wireless technology to access internet which we get in form of 1g, GPRS, edge,2g,3g,4g [LTE]. These wireless technology is derived from the telecom services that are in play in the country. With respect to India Jio, Airtel, Vodafone and Idea are the major service provider. These telecom services use defined band which give predefined frequency. Image 1 will give the band allocation through India.

From our below search to the existing network and its speed we have derived few reading that will depict the full load time of the website in all the available speed i.e. broadband, 2g, 3g, 4g[LTE].

Telecom Circle	Airtel	Reliance Jio	Vodafone	Idea Cellualr	BSNL	Aircel
Delhi	BAND 3, 40	BAND 3, 40	BAND 3	No	No	No
Mumbai	BAND 3, 40	BAND 3, 5, 40	BAND 3	BAND 3	No	No
Kolkata	BAND 3, 40	BAND 3, 40	BAND 3	BAND 3	No	BAND 40
Andhra Pradesh	BAND 3	BAND 3, 40	No	BAND 3	No	BAND 40
Gujarat	BAND 3	BAND 3, 40	BAND 3, 40	BAND 3	No	No
Karnataka	BAND 3, 40	BAND 3, 40	BAND 3	BAND 3	No	BAND 40
Maharastra	BAND 40	BAND 3, 40	BAND 3	BAND 3	No	No
Tamil Nadu	BAND 3	BAND 3, 40	No	BAND 3	No	BAND 40
Haryana	BAND 3, 40	BAND 3, 5, 40	BAND 3	BAND 3	BAND 41	No
Kerala	BAND 3, 40	BAND 3, 40	BAND 3	BAND 3	BAND 41	BAND 40
Madhya Pradesh	BAND 3, 40	BAND 3, 5, 40	BAND 3	BAND 3	BAND 41	No
Punjab	BAND 3, 40	BAND 40	BAND 3	BAND 3	BAND 41	No
Rajasthan	BAND 3	BAND 3, 40	BAND 40	No	BAND 41	BAND 40
Uttar Pradesh (East)	BAND 3	BAND 3, 5, 40	BAND 3, 40	BAND 3	BAND 41	No
Uttar Pradesh (West)	BAND 3	BAND 40	BAND 40	BAND 3	BAND 41	BAND 40
Rajasthan	BAND 3, 40	BAND 3, 5, 40	BAND 40, 41	BAND 3, 41	BAND 41	BAND 40
Uttar Pradesh (East)	BAND 3, 40	BAND 3, 5, 40	BAND 3, 40, 41	BAND 3, 41	BAND 41	No

Uttar Pradesh (West)	BAND 3, 40	BAND 5, 40	BAND 40, 41	BAND 3, 41	BAND 41	BAND 40
West Bengal	BAND 3, 40	BAND 3, 5, 40	BAND 3, 41	BAND 3, 41	BAND 41	No
Assam	BAND 3, 40	BAND 3, 5, 40	BAND 3, 41	BAND 3, 41	BAND 41	BAND 40
Bihar	BAND 3, 40	BAND 5, 40	BAND 3	BAND 3, 41	BAND 41	BAND 40
Himachal Pradesh	BAND 3, 40	BAND 3, 5, 40	BAND 40	BAND 3, 41	BAND 41	No
Jammu & Kashmir	BAND 3, 40	BAND 5, 40	BAND 3	BAND 3, 41	BAND 41	BAND 40
North East	BAND 3, 40	BAND 3, 5, 40	BAND 3, 41	BAND 3, 41	BAND 41	BAND 40
Orissa	BAND 3, 40	BAND 3, 5, 40	BAND 3, 41	BAND 3, 41	BAND 41	No

Image 1 LTE Circles in India

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III. METHODOLOGY

Below is the reading which we have managed to take in 24hrs span the full load time of the website in all the available internet speed. These reading then we have charted into a run chart to depict the frequency of the movement.

A run chart can be defined as a line graph of a measure plotted over time with the median as a horizontal line. The major purpose of the run chart is to identify process improvement or degradation, which may be detected by statistical tests for non-random patterns in the data sequence.

Factors	Full Load Time (1.1MBPS)	Full Load Time (2g)	Full Load Time (3g)	LTE
Location	6.3	60.6	22.3	7.9
Range	7.4	64.2	19.9	8.2
Frequency	9.2	68.4	22.9	8.2
Network Traffic	11.3	73.6	22.2	60.1
Upload Speed	8	60.1	12.4	9.6
Network Card	7.6	60.1	12.2	9.4
Download Speed	7.8	70.7	12.8	12.1
Processor used	7.9	58.9	16.1	9
Cache History	7.4	67	17.9	9.5
Cache Used	7.8	61.7	17.6	9
Memory Used	7.8	60.3	17.2	9
Telecom Card	7.4	65.8	19.5	9.1
Cell Antenna	7.4	60.3	17.5	9
Maps	30.6	60.8	17.1	10.5
OS	7.7	85.7	17.1	7.9

Table 1 Data for Uber

Factors	Full Load Time (1.1MBPS)	Full Load Time (2g)	Full Load Time (3g)	LTE
Location	1.7	62.6	11.8	5.9
Range	1.7	68.1	11.8	4.3
Frequency	2.8	65.5	12.1	5.6
Network Traffic	2.1	63.6	12	5.8
Upload Speed	1.7	67.2	12.2	5.8
Network Card	1.6	67.2	12.1	5.8
Download Speed	2.2	67.6	13.9	5.1
Processor used	1.9	69.2	14.1	6.3
Cache History	7.2	69.1	15.3	6.3
Cache Used	2.4	69.5	12.1	3.5
Memory Used	5.3	66.1	13.6	5.1
Telecom Card	1.8	75.5	13.4	3.6
Cell Antenna	2.4	68.1	12.8	3.7
Maps	1.5	68.1	12.5	3.5
OS	1.6	74.7	13.1	3.4

Table 2 Data for Ola

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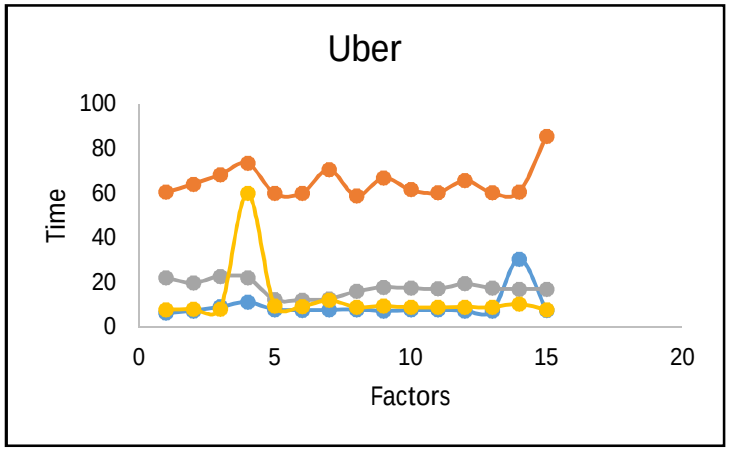
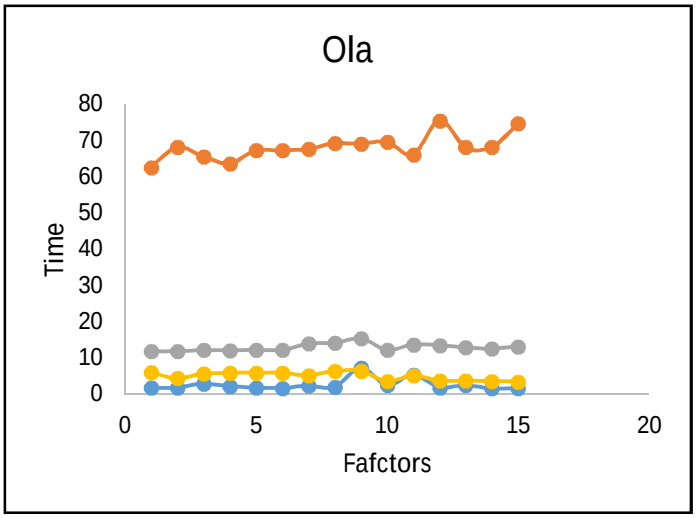


Graph 1 Run Chart for Uber



Graph 2 Run Chart for Ola

Above we have taken 15 factors and reading on different net speed. Different net speed is giving different full load time for the website. The main network issues that we have found out of this are mentioned below.

A. Network speed [Broadband,2G,3G,4G[LTE]]
B. Location
C. Network Traffic

These are the network issue apart from the network issues there are other issues that we have come across. Website depends on the network connection mostly while when your using a mobile application there are various other issues that arises to the working of the application those issues are mentioned below.

1) Memory usage
2) Cache usage
3) Processor speed
4) Ram
5) Internet card
6) Total load time

We have compared 2-3 mobile that we have access to automate and observe the result that we were able to record. We come across that application behave differently in their full load time and that is majorly depending on the process used and how much time it takes to load an application and start it completely running. once the application is up and running from that time internet plays its role of operating the application. These application needs to have an internet access without the internet these applications are unable to operate. Below are examples of our automated testing for the application Uber and Ola.

Image 2 Automated Test Results for Uber [Google Pixel]

Image 3 Automated Test Results for Ola [Google Pixel]

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Image 4 Automated test result for Uber [Google Pixel]

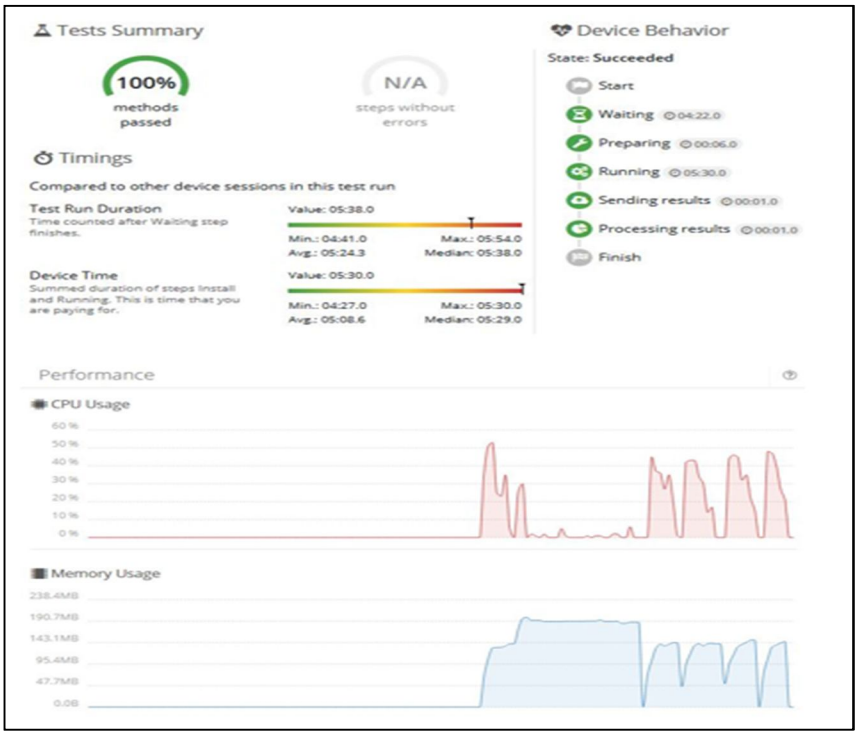

Image 5 Automated test result for Uber [Google Nexus]

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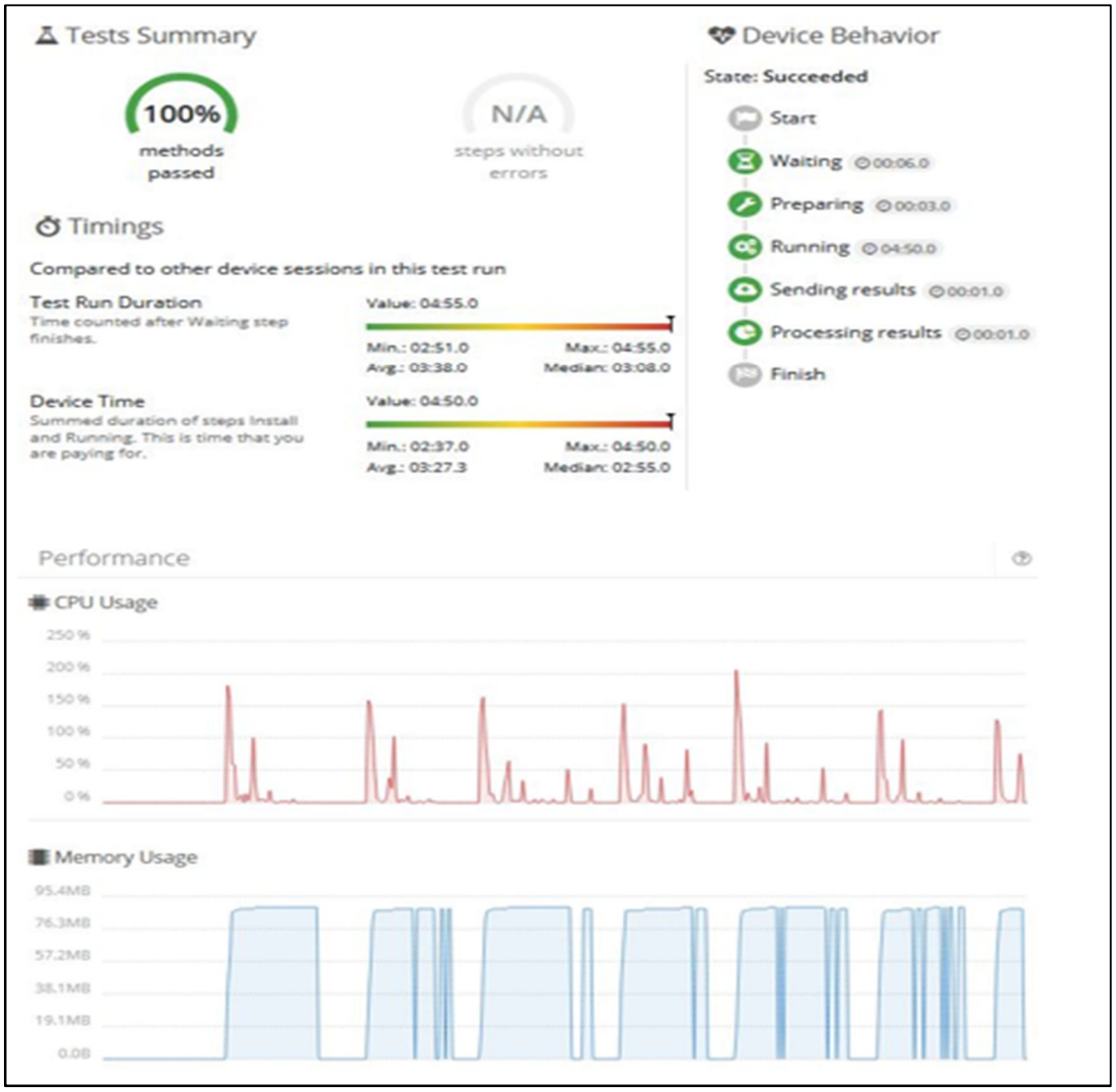

Image 6 Automated test result for Ola [Google Pixel]

From the Image 2 and Image 3, we can see the CPU, memory and network usage on the devices. Image 4, Image 5 and Image 6, show us the test results for Uber and Ola application on devices such as Google pixel, LG, nexus. It has come to our observation that depending on the mobile the function of application will differ and the reason are already mentioned above.

IV. CONCLUSION

From the observation we have done above to identify challenges related to the network for the use of the taxi services application or website it has come to our understanding that with the issues related to the network there are other issues like [Hardware] that plays role in the functioning of the application.

V. RECOMMENDATION

A. New service for feature phone like SMS or toll-free.
B. Use of google maps instead of integrated maps.
C. Use of offline maps and use of mobile GPS tracking system to track.
D. Use of website integrated into the application to reduce the memory usage.
E. Can use google login to identify and track the user and the driver.

VI. ACKNOWLEDGEMENT

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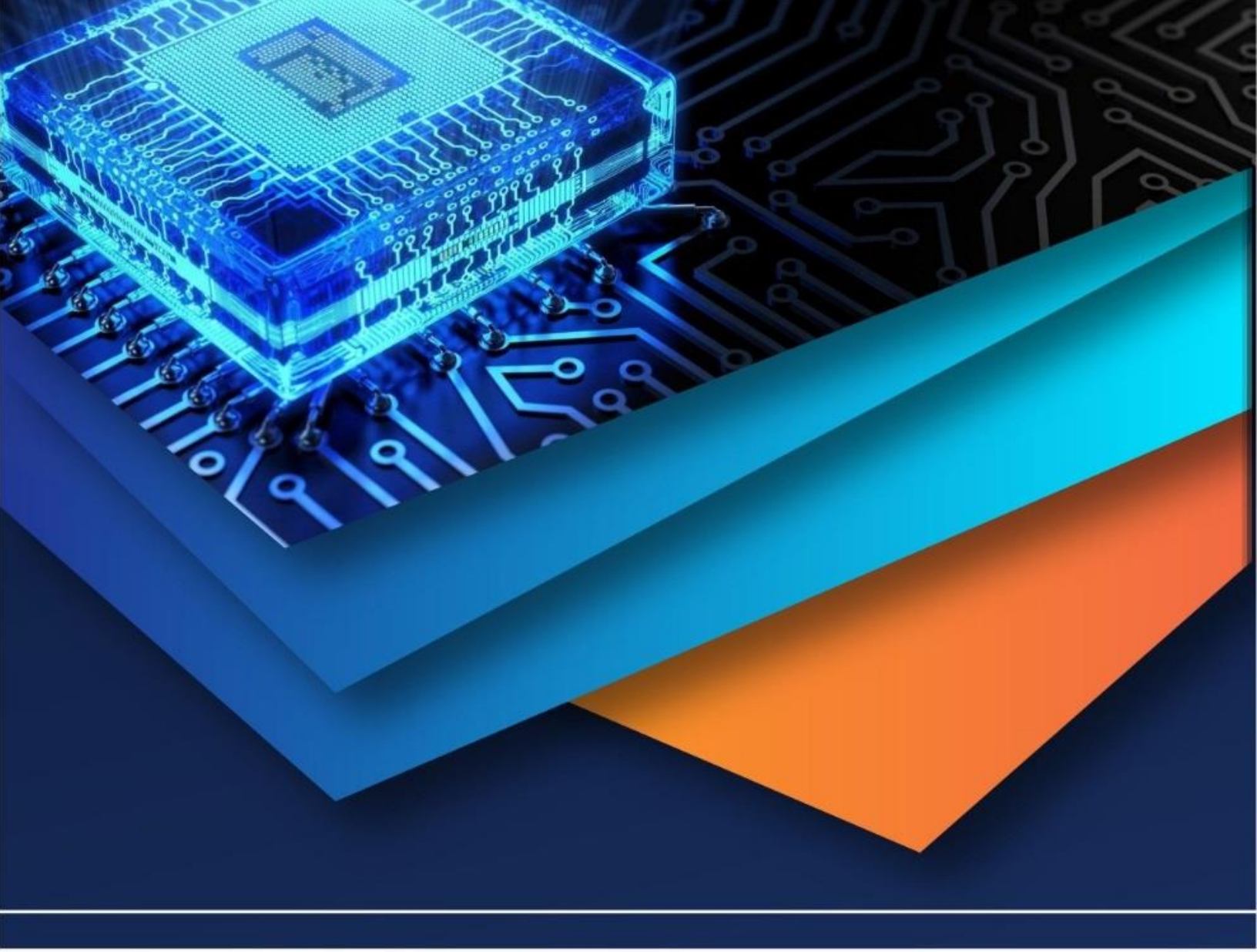

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