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A Revolutionary Gaming Style in Motion

Zarif Bin Akhtar

Abstract

From the timeline of the year, 2012 MONECT has been aiming towards the conceptuality for developing the formulation of making a virtual remote controller for a wide range of variety within the context considering various types of devices and peripherals consisting within the prospective realm of virtual controlling. Moving forward, where recently in the timeline for the year of 2017, the including of the functionality of that very same aspect with numerous advancements which was termed and computed as a remote desktop session with gaming control for a wide variety of games which includes games like Racing, Frames Per Seconds (FPS), Role-Playing Game (RPG) along with many more where each type of gaming aspect was equipped with its own perspective type of setup and a familiar type layout for the users who were considered for having different types of controllers for each specific gaming style and associated gameplay render. The project prospect evolved further within the year timeline of 2019–2021 which introduced and revolved around the rapidly deployable features and functionality with integrated advance-ments in terms of computing and gaming as a whole. Based on that deployment project outcome and developmental scope of the research, the application utilized the full use of the provided onboard sensors to give the user the ultimate experience while performing gameplay (for example, like the Accelerometer sensor, G-Sensor, Gyroscope sensor, Camera sensor etc. with many more). Each of the sensors controlled a different particular aspect of control. For instance, Frames Per Second (FPS) mode triggered and enabled the Gyroscope sensor which would allow the user to aim at their perspective targets for a solid headshot kill. On the other hand, the Race mode used the G-Sensor to enable steering mode of movement in the form of any vehicle. Besides that, the virtual remote sessions brought about the privilege and also gave each user a simultaneous interaction among devices and peripherals with real-time remote access at any given moment in time of usage.

Keywords: Virtual joystick controllers, Real-Time remote sessions, User-associated, remote access, Simultaneous session access, Real-Time interactive gameplay

1. Introduction

Before starting off with the details let us get some terminology of concepts and their usage in terms of computing and processing out of the way with some familiarity. The discussed aspects were altered and customized to provide the final output for the application development.

Firstly, Remote Desktop Connection (RDC) or Remote Desktop Protocol (RDP) is a proprietary protocol which was developed by Microsoft, that provides a

user with a Graphical User Interphase (GUI) to connect to another computer over a network connection [1]. In order to create and establish that particular connection, both devices required access with one another, for the user who deploys the RDP client software for the purpose that, while on the other hand the other user must run RDP server software. Microsoft concurrently refers to this official RDP client software as Remote Desktop Connection, formerly "Terminal Services Client" [2]. Added that, the protocol which gets established remains a one-way connection, in other words only one host session but no simultaneous interaction among the associated devices [3–22].

But MONECT came up with the conceptuality and the idea for an application which would have a simultaneous session on both hosts or both of the associated devices [23]. Thus, the idea conceptuality brought a fresh new dimension to the context of the research project, and resulted in the PC Remote application [24, 25]. The approach to the solution was that, a device compatible application which would be connected in a network-associated integration both from the user and the device end. So that, no rendering would take place whether if the user happened to be an IOS or an Android or a Windows Phone user. There had been no limitation towards device compatibility. Various features with integrated functionalities had been developed within the application [26, 27]. On the per of that context, how much calibratable the application would be, varied from user to user as each and every user would have a different set of needs from the privileged application and its utility of tools with features. Also, no need requirement for hardware and assembly for any type of parts or components since the application would take advantage of the onboard integrated peripherals of the smart devices. But users had to install the provided driver for the application in order to run the app which was prebuilt inside the application from both the user end and the device perspective (www.monect. com). To run the app, any user can download the main file from Google Play Store (MONECT PC Remote) [28].

For clarity and max performance along with computation, the link for the individual platform was also provided in the website. The configuration layout of the application was built and developed from the Android Version 4.0 which was termed Ice Cream Sandwich for the reason that, the application would have no compatibility issue with almost 98% of apk platforms. Along with that, if the usable devices were equipped with higher versions which would be much better for the prospective users. The installation process was basically download & install, afterwards, it's an integrated configuration with any basic type of Wi-Fi connectivity to connect and run the application. But bear in mind of the fact that, the user needed to be within the same network for the connection establishment. Within this scope of the chapter, the features and functionalities which were deployed from within the application along with the formulation and advancements to the application which will also be described on a further detailed manner.

2. Formulation of the application

Now let us start with the hardware functionality. The Hardware implementation was configured and formulated within the Smartphones themselves. Every smartphone was unique in its own way with both for its features and functionalities, but one aspect that still remained stagnant throughout the course of time was the sensors which were equipped and associated within a particular device.

Since the dawn of smartphones were introduced, our mobility with sensory took flight in the form like camera, proximity, gyroscope, accelerometer, light, ambient aura, motion, pedometer, rotation vector, orientation, touch, magnetometer,

thermometer, microphone, fingerprint with many more. But over the passage of time, almost 95% of the smartphones had the majority of all the basic sensors which the application required to collaborate with the devices associated along with it and as for the rest, it was mainly software implementation with various rendering provided from designing, coding, wireframing and terminal commanding sequence of the programming perspective. To minimize the complexity for the functionality and user experience, virtual triggers with touch buttons were placed for the utility feature deployment of the application (**Figure 1**).

Next, the development for the application was built and deployed under three phases where each and every node connection was confirmed with the establishment through the Internet Protocol (IP) associated within the internet network connection. As I am sure, we are all familiar with the terminology of the subnet mask and default gateway for the render of an internet connection provided by the ISP. But please bear in mind, the pathway connection would work only when the user is within the same network [29]. For a better understanding on this matter, let us break down the connection bridge of the communication which mainly takes place and is performed inside an internet connection and how the operation will be executed.

The subnet mask was employed by the TCP/IP protocol to see whether or not a bunch is on the native subnet or in a foreign network. Internet Protocol (IP) Access provides users with an IP address to remote networks. IP Access connects the user to a beacon of victimization which is called an OpenVPN tunnel. Afterwards, the GRE protocol is then configured to bridge this affiliation across the present beacon VPN tunnel established from the node to the beacon, onto the management local area network connected to the node. Whereas when connected, the user will access the IP addresses on the remote management local area network directly, like by the usage of the ping command or by writing them into the browser address bar. To be more specific on the matter, consider this aspect as the back-end computation factor considering our browsers and the establishment of a successful internet connection.

Bluetooth which if utilized properly would also be a source of wireless technology traditional for exchanging information between mounted and mobile devices over short distances, short-wavelength frequency, radio waves inside the economic,

Figure 1.
A graphical view of the hardware components (smartphone).

scientific, and medical radio bands, ranging from 2.400 to 2.485 GHz, and building personal house networks (PANs). IEEE 802.11 is a part of the IEEE 802 set of local area network protocols which specifies the set of the media access management (MAC) and physical layer (PHY) protocols for implementing wireless native house network, wireless local area network (WLAN), the deployment of wireless fidelity (Wi-Fi), laptop computer communication in varied frequencies, also as but not restricted to a tier of four, five and sixty rate frequency bands. These are the protocols which do the square measure.

Typically, square measure utilized in conjunction with the IEEE 802.2, and a square measure designed to interwork seamlessly with the local area network, and square measure fairly and usually accustomed to carry the internet Protocol traffic. The 802.11 family consists of a series of a half-duplex over-the-air modulation techniques that use constant basic protocol. The 802.11 protocol family use carrier-sense multiple access with collision dodging whereby instrumentality listens to a channel for various users (including non 802.11 users) before causing and interfacing with each and every individual packet. A router may need interfaces for numerous styles of physical layer connections, like copper cables, fiber optics, or wireless transmission. It can also support wholesome transmissions which are completely different network-layer transmission standards availing to the current standards provided till now.

Every network interface that is utilized to change the information packets to be forwarded from one gear end to another which is very unique. Routers could, in addition, be conversant in connecting to a pair of or plenty of logical groups of a laptop or computing peripheral devices referred to as subnets, each with a definite network prefix. Once that information is transferred from one device to a unique on an Internet Protocol (IP) network, it's lessened into smaller units referred to as packets. In addition, with that, to the actual info, each packet includes a header that contains the information to help it to induce to its destination, rather like the physical address information realized on a mailed envelope like the traditional methods available. Transmission Management Protocol (TCP) and other rendered protocols which actually are totally different protocols, do their work within the data on the machine, then it's sent to the data process module, where the data packets unit bundled into information science packets and are sent over the network which is inclined with individual users along with their activity and connectivity to the internet.

To succeed in their destination on the opposite facet of the planet, the information packets should meet up with several routers. The work these routers do and performs, is termed routing. Each of the intermediate routers "reads" the destination information processing address of every received packet. Supported to the data, the router sends the packets within the acceptable direction as every router incorporates a routing table wherever data concerning neighboring routers (nodes) is held on. This data includes the value (in terms of network necessities and resources) of forwarding a particular packet within the direction of that neighboring node. Data from those table is employed to choose the foremost economical node to use or the most effective route on that pathway in order to send the information packets. Every packet is sent in a very totally different direction, however, they eventually all get routed to a constant destination machine. As a consequence, to this, using a global positioning system (GPS) navigation it is also possible to track that movement remotely which is also implemented within the current design approach of the application.

Fast forward to today, with the rapid improvement and innovations in technology, most of the communication protocols have given birth to better enhanced and advanced connectivity which are now achievable in terms of mirror cast, NFC, wireless share, screen cast, nearby share plus many more.

Considering for the network perspective among regions with better speed in bandwidths the faster each seeds gets executed.

The author of this chapter has been working with MONECT from the timeline of year 2017 to present and throughout the years there have been major and minor changes deployed within the application. In the year 2019, the author published a research paper [30] with his specific sets of development and integration of functionality and features, including of the virtual remote sessions which the author had developed himself. Afterwards, the application still continues to grow with different aspects of features based on user recommendations and collaborating ideas which has been in effect till now. The custom utility and user interactions will continue to grow in the near future as well (**Figures 2** and **3**).

Figure 2.
The block diagram of the application (segment 1).
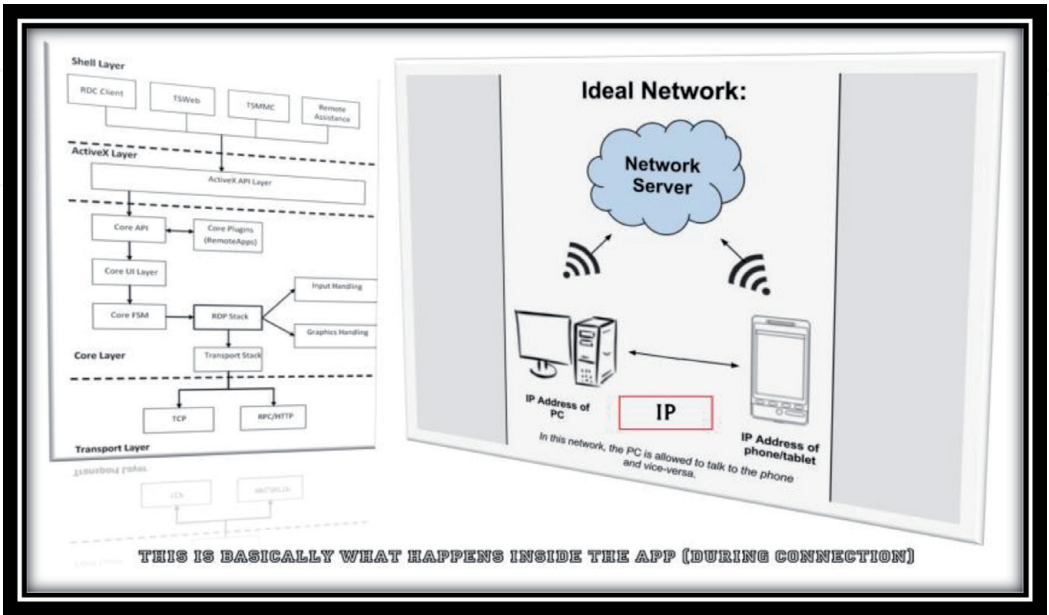
Figure 3.
The block diagram of the application (segment 2).

In order to, use the application, the setup with the configuration was needed to be performed and had to be configured from the user end. At first, from any desired browser the user would type in the link address (www.monect.com) and from inside the website the required steps are given on how to setup the application. The user will select as per their choice from which link, they will forward with the download. For max performance and better enhancement, the software has been upgraded and configured for 64-bit versions to provide the ultimate experience and functionality control for the tools and features equipped inside the application.

Next, in terms of the software integration, the device driver plays a pivotal role. After installation if required, the application, itself will download necessary drivers in the case if any was missing from user machinery (Desktop, Laptop, Notebook). Next, the user needs to provide access and give permission from the firewall in order to allow the connection to be created and established (Pop-ups will be shown when the driver is detected and the connection is established) (**Figures 4–8**).

Figure 4.
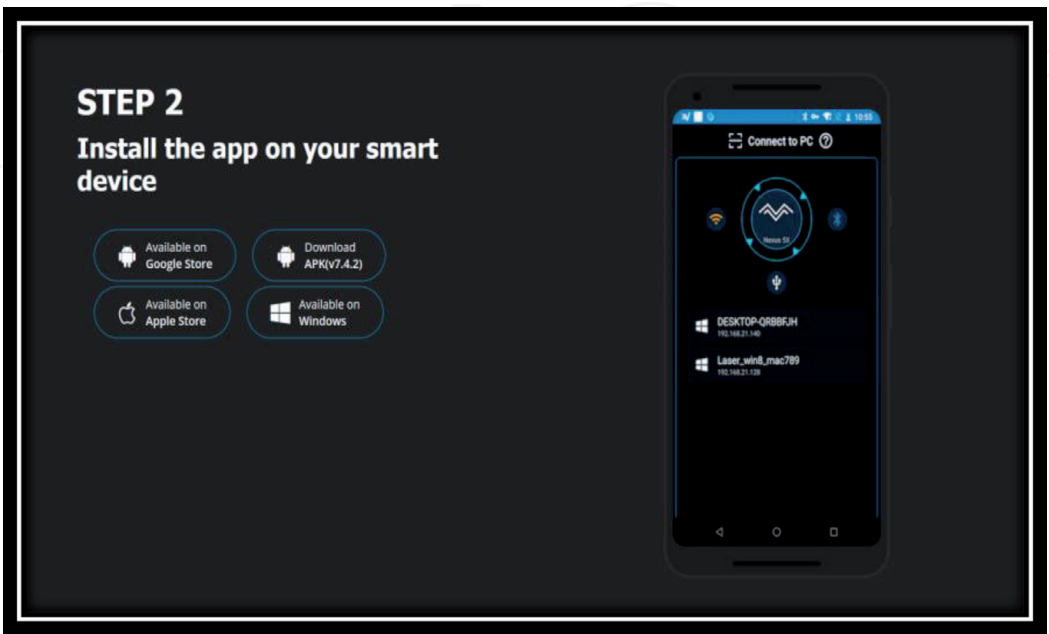*The website layout with the receiver software distribution.*

Figure 5.
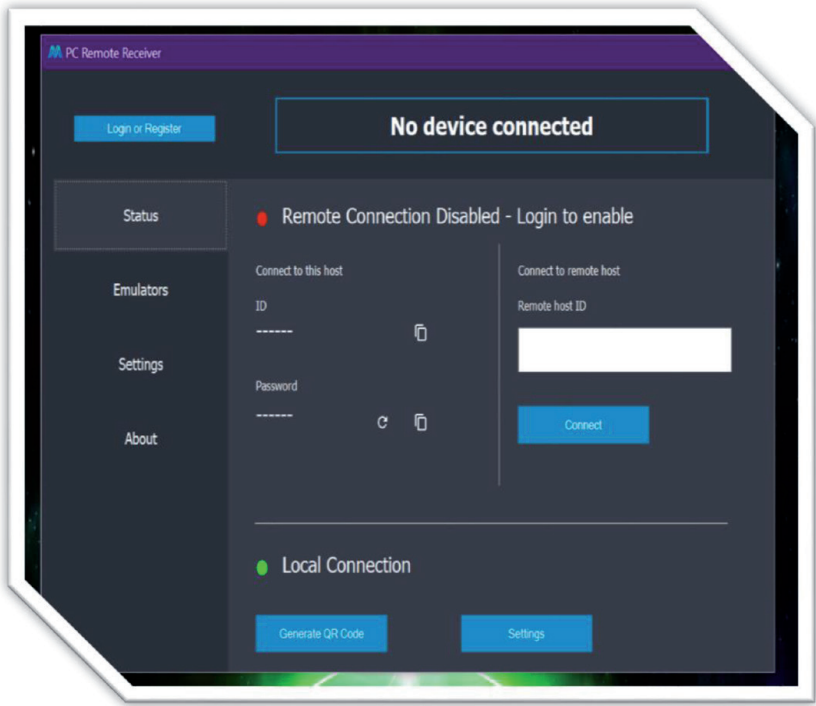*The software distribution app for the smartphone.*

Figure 6.
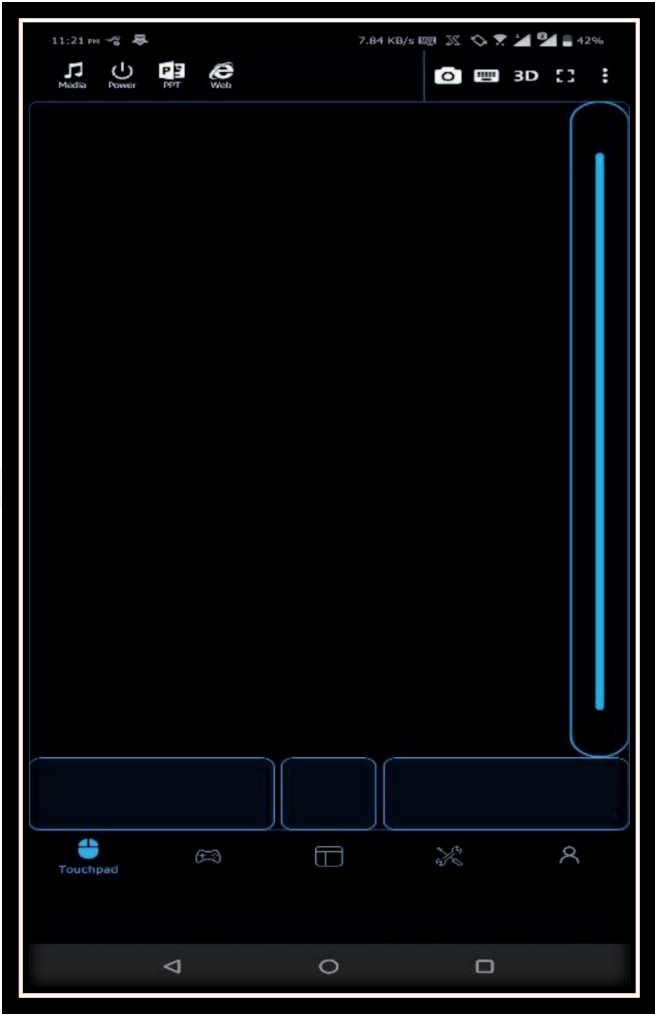*The software distribution after installation (PC remote receiver).*

Figure 7.
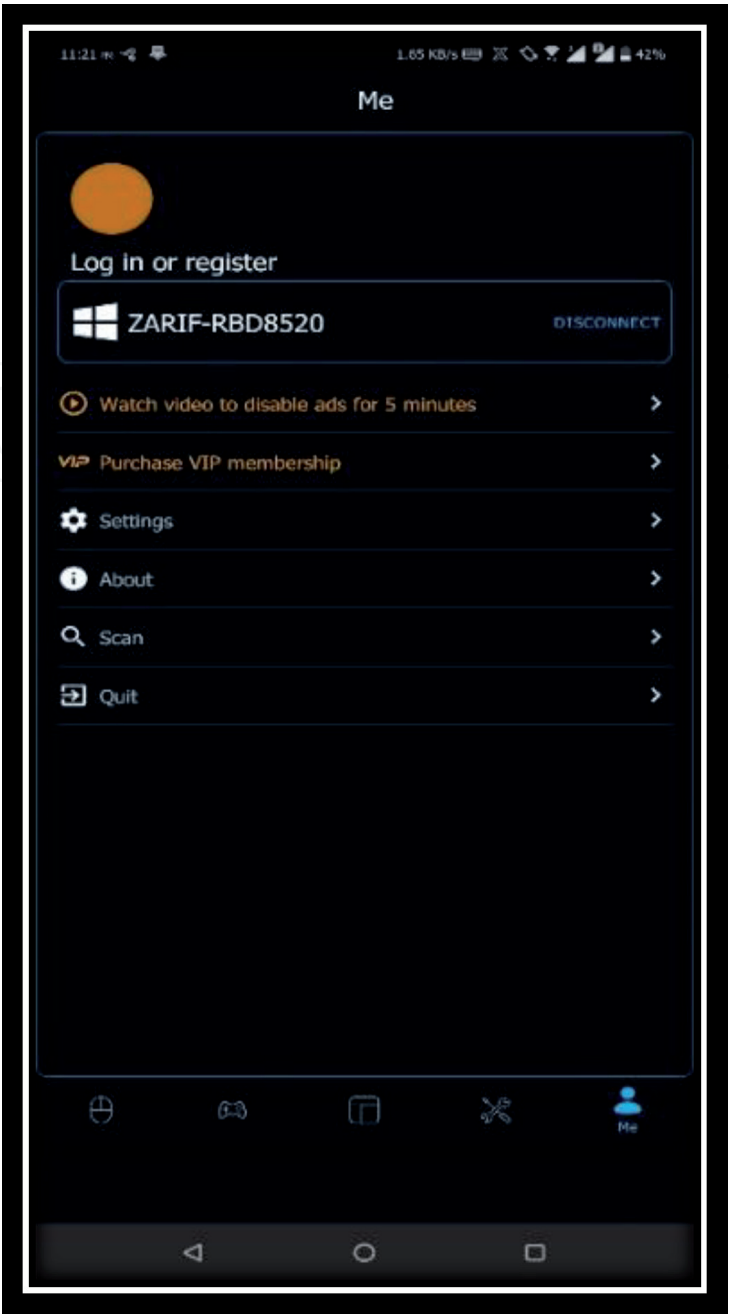*The layout design of the app from the smartphone.*

Figure 8.
The layout of the app from an established connection.

3. Virtual gaming layouts

In terms of gaming, a gamepad is an essential aspect concerning performance and accuracy in terms of computation for any rendered gameplay. For a competitive gamer or a noob or just a random player in the realm of shooting, chasing, drifting, controlling, precise allocating of targets, navigation view is of apex value and these are the aspects what determines the outcome of scoring the final win and emerging as a champion for the context on the perspective. Making the apex of head shot kills with the absolute precision and accuracy. All these prospects revolve around the control from the player and his ability of control from his associated device controller. The better the control the higher the probability on the chance of winning. There is a saying that accumulates and prioritize on the matter of selection for a controller that, more frames mean more kills and more frames means victory is at hand with absolute dominance. For competitive gamers it comes to down to the spilt second of a shot which determines the victory outcome for any gameplay.

According to the stats, the gamepad was invented and introduced in the year 1983 which got released later in the year 1985. But in that era of time, it was much complex and very hard to manufacture. After Technological improvements in the recent years, the scale and quality of gamepads has exceeded the gamer expectancy. Still despite all the advancements, it's still a very costly deal when it comes resolving around gaming setup and control efficiency of the associated peripheral devices. The apex root major fact to consider, would be the implementation of the wiring that is associated with its devices.

Next concerning gaming, the setup of gaming peripherals is what alters the course of achievement in terms of performance, efficiency, control and having the optimum machinery. The concerning factor on this issue is the aspect of cost. Cost brings down the scaling factor in terms of machinery and the control for its associative peripherals. Because the better the machinery the higher its cost will be. On the scaling of performance many factors change the perspective of usage and its ability to perform at its level of apex. Graphical computation, frame enhancement, memory mapping, process emulation, terminal sequencing, environment adaption, buffer render varies to a great extent when considering the machinery integration. This limits out the user experience in various states of matters considering for any kind or type of rendered gameplay in real-time interaction.

After the innovation of smartphone concept and its connectivity of control sparked the world, it completely changed the landscape in the realm of gaming and computing to a whole new level. Considering the modern day to day activities our whole assembly of work revolves around smartphones. These smartphone devices have become our daily companions in terms of usage and activity to a great extent. Various technical companies provide us with different sets of smartphones which comes well equipped with many sets of sensors and that is where the application comes to play. The application provides advanced functional utility features which comes well equipped with a variety of virtual joystick controllers/layouts (**Figure 9**). Each of the features provide real-time simultaneous interactive sessions in any given time of usage and activity for any type of gameplay (**Figure 10**).

To make the experience at the level of apex, the user could add and design their personal custom controllers/layouts accordingly due to the fact that, the application was built with the conceptuality of being user-friendly and the scope for its updating was also provided for real-time gameplay sessions (**Figure 11**). Along with the flow of time based on new release of games and their popularity with demand side by side attached with user needs, the layouts will be deployed with updates in each respective time of gameplay and collaboration.

The application had a collaboration with FAMICOM which has been built-in with the app and has an approximate of 31 games included which users can directly open and play (**Figure 12**). And if the user has personal games installed in their PC, then they can directly configure the layout from inside the game settings like an ordinary gamepad or controller. The application will integrate itself automatically. Next, the user just needs to assign the key buttons as per their desire and choice.

What sets this approach above others is the fact that, each prospective had its own set of layouts and if the user desired for any changes or alteration or modification one could make their custom personal layout as well because the user had the option for adding their design layouts. What makes this application unique because due to the fact that, the real-time interaction gameplay with simultaneous interactive sessions for any type of rendered gameplay environment.

For the virtual joystick controllers, its similar to physical gamepads and joysticks when plugged in and configured from user end for each specific key to key or button to button selection. The same functionality and perspective apply to the virtual controllers as well. So, the user can set each key button as per their usage choice and
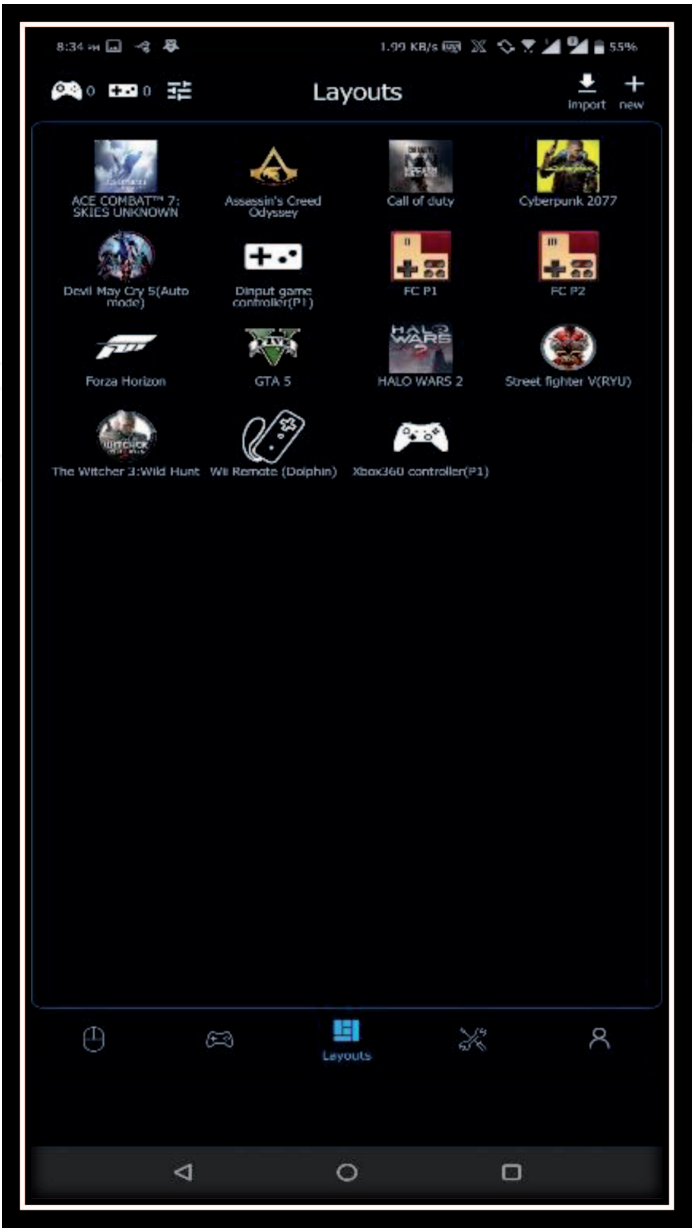
Figure 9.
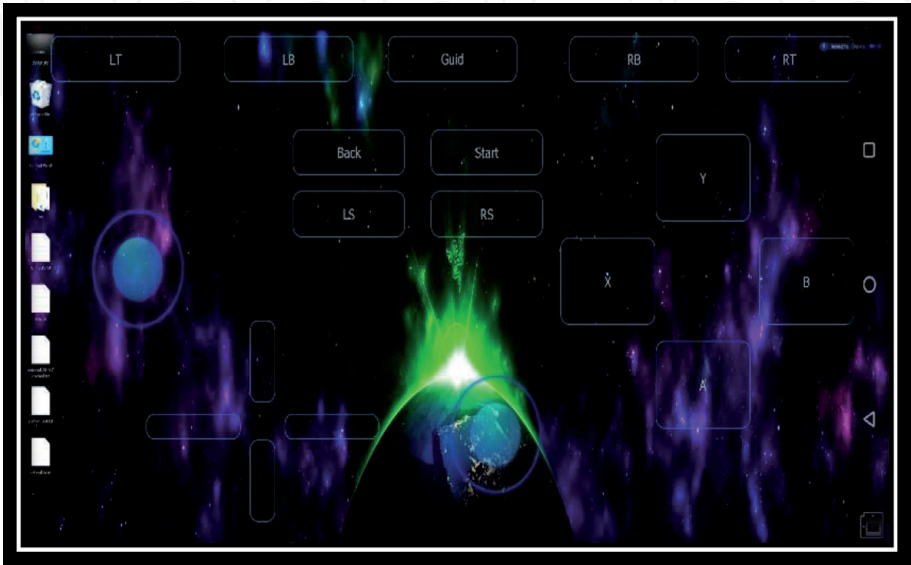*Virtual gaming layouts for different variety of games.*

Figure 10.
Virtual gaming layout in a desktop real-time session.

Figure 11.
Real-time gameplay session.

Figure 12.
A collaboration integration from FAMICOM.

then all ready for gameplay. The only difference was that it was virtual & remote and operated in a real-time dynamic session for simultaneous interactions among the associated devices.

4. Remote desktop sessions

Being a windows user and as its usage being revolved around globally, I am hoping that most of us are familiar with Remote Desktop Connections (RDC) since Windows still remains to be the oldest and optimum OS till Now. I know many might have different opinions on the matter which is very much understandable.

As mentioned previously the limiting factors concerning remote desktop connection for one host entry, the application brings a new complete diversity of experience and control concerning remote sessions. The app processes interactive simultaneous graphical interpretation in terms of sessions which are termed as the virtual remote sessions. Each segmented session uses advanced graphical computation protocols which work in both device and from user end for device peripheral associativity [3]. In the case for the Remote Desktop Connection (RDC) the user has access to only one session at a time from a particular host/guest mode while on the other hand, the other mode gets switched to lock screen mode and the connection established works only within a forward path [31]. Which concludes to the matter that, only one host machine processes the interaction. The app development solution overcomes this very issue and at the same time provides simultaneous interactions to users from both ends from a machinery stand point [2]. In order to understand the full scalability of the matter, it would be better to let the users interact and use the application to find it out for themselves.

The designated user also can prioritize control access based on their ability and desire to give access based upon their choices. As it stands out in order to have optimum proficiency in terms of usage and activity the less the hassle the better the experience for the user. Sometimes due to the complexity of certain functionality, many best applications lose their rank on the ladder scale. From that retrospect, the conceptuality for a remote session came about and was developed into a reality. The goal of the feature was to provide an exceptional experience in the realm of remote activity (**Figure 13**).

Apart from the remote desktop session, a variety of utility tools and features were also equipped with the app (**Figure 14**). For a developer, remote access is of immense importance during the layer of design of development for any application or product, or software [32]. As there are many peripherals interlinked with the
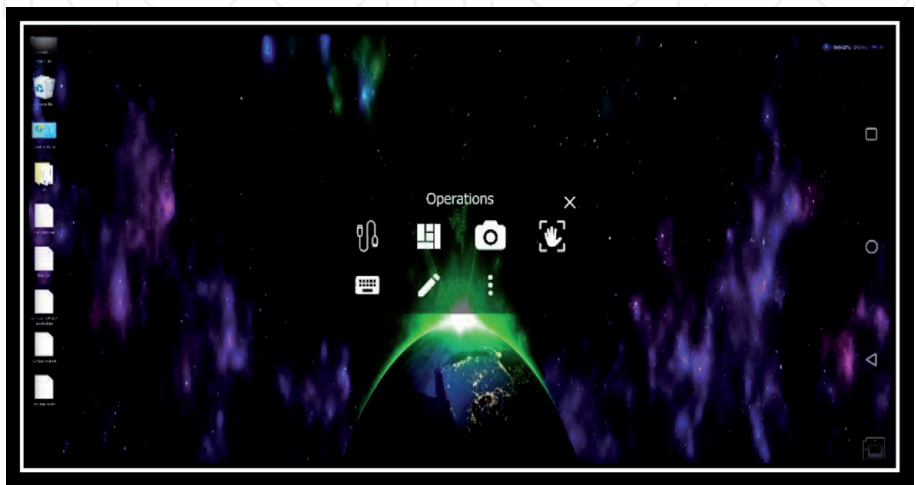

Figure 13.
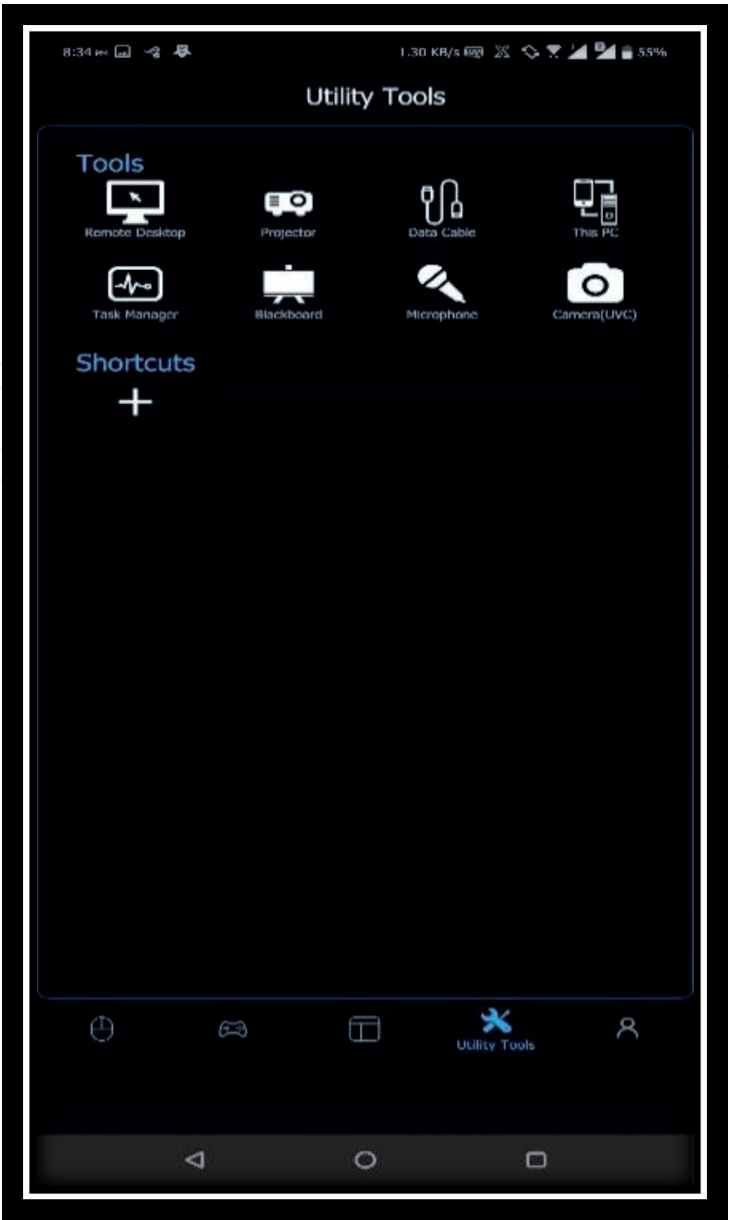*A representation of real-time remote desktop session.*

Figure 14.
Associated utility tools from a remote session interaction.

performing of the task for deployment. Even for any normal user having remote access provides ease of work as the interactions are performed remotely. This application gives users access to that very aspect and provides for the integration of microphone and projection from the associated device if required. Many may argue that NFC is a probable solution in this aspect. Yes, that is partially true but for gamers who stream their content or have multiple peripheral usages in terms of computing, this application provides a solution and gives the users a significant amount of control from a remote assembly (**Figure 15**).

For clarity and a better understanding, if a user is working with data or any type of content that is on both devices apart from one another, this app will create a pathway to have precise control on that particular issue (**Figure 16**). Not only that, but users can perform on both devices in real-time interaction from any given session.

In many situations or during research work or performing any particular task most of the time it becomes easier to relocate the information and data based on personal notes and pointers. For problem solutions and brainstorming or generating ideas, wireframing of certain project prospects, the notes play a very significant role on the aspect of the matter.
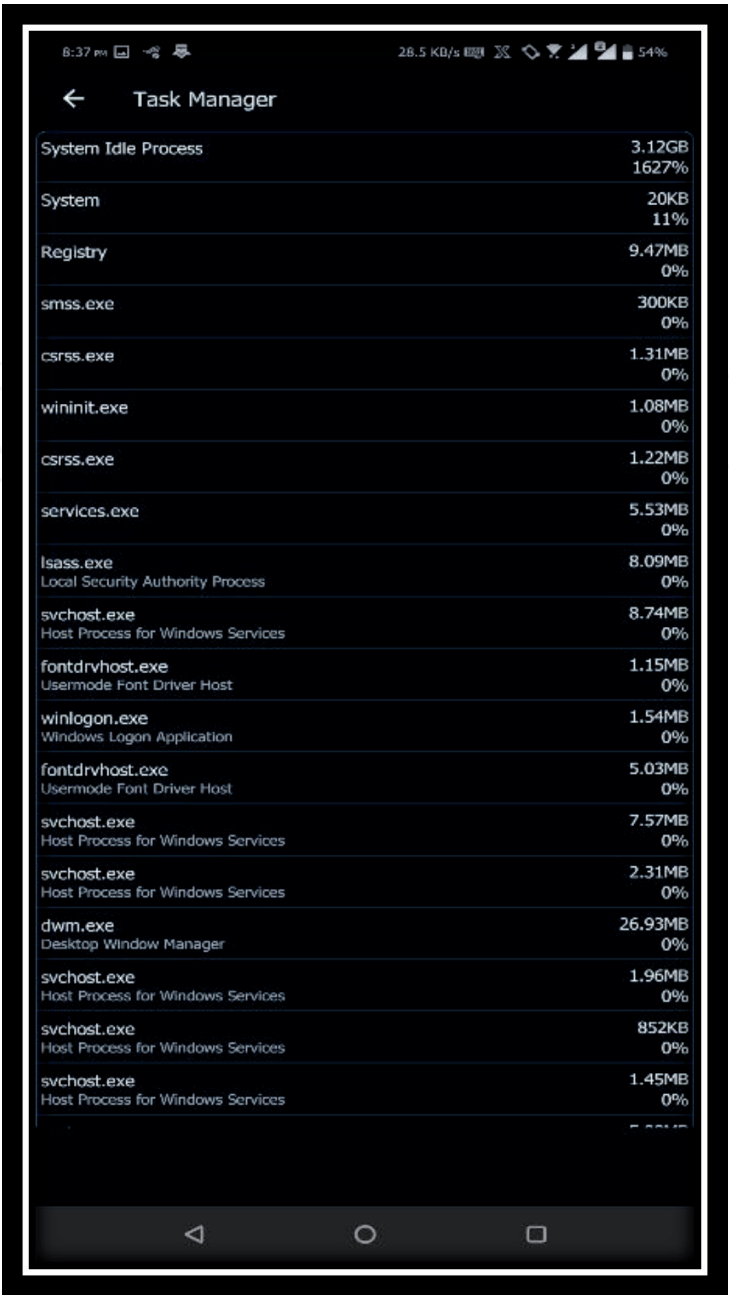
Figure 15.
Real-time interaction of task manager from a remote session.

Keeping that perspective in mind, the application provides a solution on that particular matter through the Blackboard remote session. The user can edit and alter in real-time simultaneous sessions and if required can save the process of execution as a screenshot or photo. Text editing and writing permissions are resourced and allocated from the smartphone interphases and brought to utilization when using the Blackboard functionality. Consider any important document that requires alteration and modification from a remote access assembly from the user end, this functionality will provide a solution in that regard. The Remote Desktop Protocol (RDP) is integrated within the app which the user can use simultaneously both on android devices and the Windows operating systems (OS) and the user would have full access to the windows OS from the associated android device. A taskbar with basic aspects of control was also provided for hovering and zooming around the display considering for detailed fonts or texts. As each display screen size will vary from one smartphone to one another based on users. But if required users can customize the display according to their desired retrospect for clear selection.
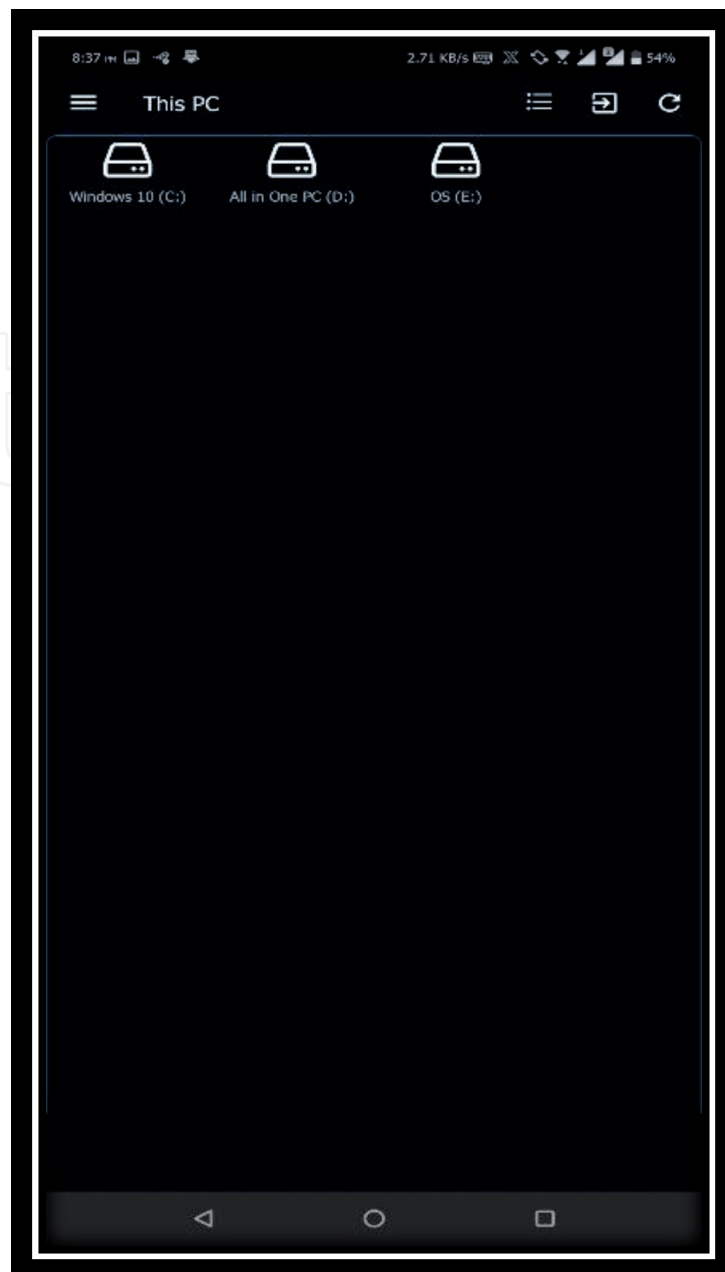
Figure 16.
Real-time interaction of desktop PC in a remote session.

5. Additional features and usage

The described features and functionalities were introduced in the year timeline of 2017 and over time were updated within the timeline of 2019–2021. The author had designed and developed these features as a prototype factor and with time each of those functionalities was updated for better performance and usage. The author had published that current research work in 2019 under the IEEE platform [30].

Afterwards, an added feature was introduced and developed by the author for the real-time desktop remote session which is currently in effect on the latest version of the application. The feature gave a full real-time interaction on both devices running at any given working point. Let us simplify the matter with a little detail. For example, let us say the user is currently listening to music from the audio player in his PC, and at any point in time when that user opens the remote desktop session, the concurrent running dynamics will be displayed and processed from the smartphone end with the including of audio in real-time. The same aspect will work for videos as well.

There will be no lag and it will not work like NFC, rather it will work simultaneously for any given time for any state of the process. The user can end the session at any time as per their choice. And if the user opens the session again it will portray the current running dynamics on the PC. Also, the user can control the Desktop PC environment from the smartphone touch sensor. The whole session will give access to the PC end as well. In simple terms, simultaneous real-time interaction on concurrent dynamics from dual devices. Many might be a bit confused on the part of this context. So, the best way to understand from a point of view would be that, use the application and things will become crystal clear. This feature is still found very rarely on today's device peripherals which is the reason why this feature makes the application very unique as many apps have failed to make this functionality available.

Apart from that, virtual remote control for keyboard, PowerPoint representation, multimedia utility, webpage search with Uniform Resource Locator (URL) loader and Operating System (OS) power control like shutdown, restart, lock, sleep, hibernate, sign out and many more along with mouse selection protocol for
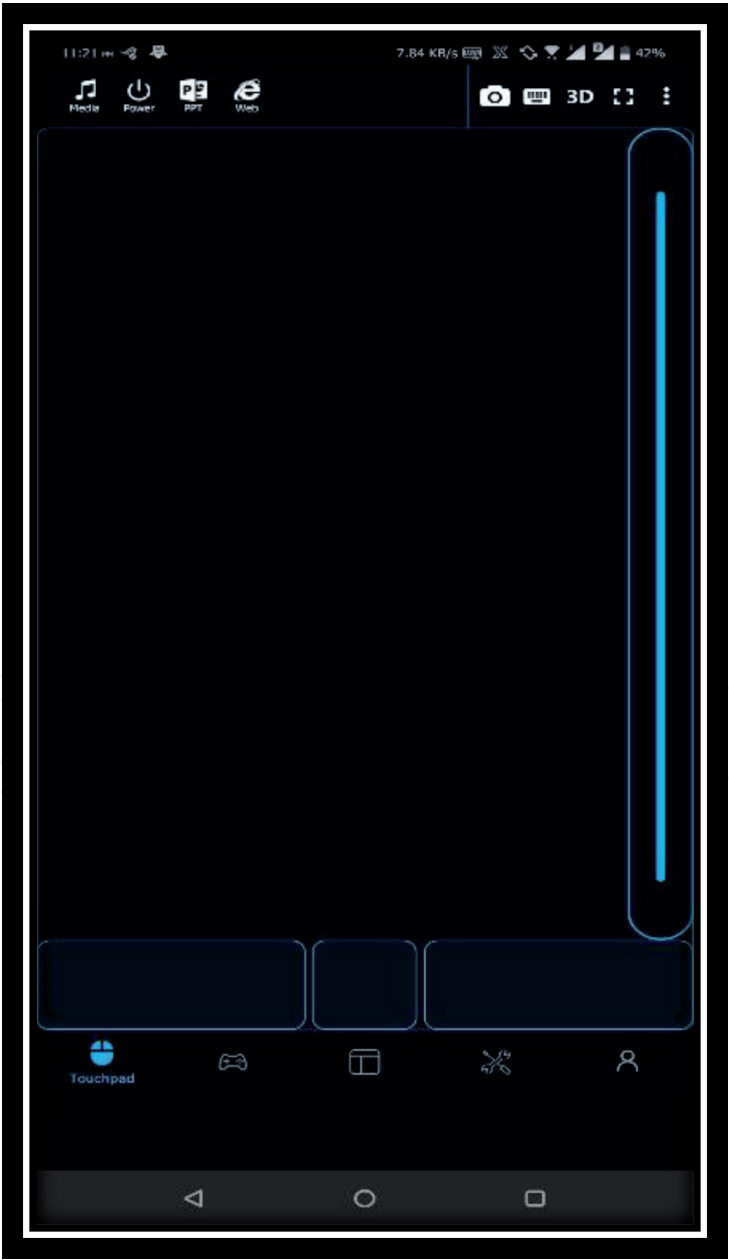

Figure 17.
Touchpad control from the smartphone app.

both left and right controls (**Figure 17**). Over the period of years from the user's various requests were made and many design outlets were queried to give a better representation for the control segment and access. After doing various testing and trials on the matter the final design deployments were equipped to the application and was set in motion. It is understandable since in our most daily works the PPT gets used numerous times and especially for working people in the industry it has major usage activity. Based on that prospect of scope and level of interaction in that aspect the provided design feature has been advanced to a certain degree to satisfy the needs. In future this will continue to improve based on need and usage of interactions.

For PowerPoint presentations, this app brings a new dimension of usage in terms of productivity and demonstration of the materials consisting within the slides. One needs to use the utility to fully understand the experience of the functionality and its impact from a remote access perspective. Despite all the functionality considering for the older generation of computers and devices the usage of QR was also integrated (only for older versions). There was a Quick Response code (QR) generator providing users with immediate interaction and connection.

Considering the timeline of usage from the release of the application, the members continue to grow and new users are on the rise even to this day. From the stats of the 2020-year timeline, the app has crossed 5 M+ downloads which is a very big milestone to uphold. From the providing of the free version, there is also a premium (VIP) version for paid users. The features and the functionality of the application were altered and modified based on the user demand and necessity of scope from the future devices. The application will continue to provide future updating for every functionality to give its users the apex of optimum supremacy. Apart from that, the application was user-friendly and ready for use. More new and unique features and functionality would be provided and would be updated which would be available to all the users via the webpage and Google Play Store [33].

6. Conclusions

To put it in a word, the main major difference that came about was the fact that, the users had the scope and opportunity for the operation of the application and if required or needed could alter their customized layouts and directly operate from that assembly. On the context for remote access to the level of degree the application provides is still very rare considering the enormous number of apps available in the global level today. Added that, the computing in terms of gaming and render of performance has brought a whole new dimension to virtual remote access control. Not only for gamers but for any professional or a researcher the app gives a new retrospect to minimize hardware integrity with cost minimization. In today's modern era of computing, a controller for all your device peripherals.

Acknowledgements

Author details

Zarif Bin Akhtar
Computer Engineering (CoE), Faculty of Engineering, American International University-Bangladesh (AIUB), Dhaka, Bangladesh

*Address all correspondence to: zarifbinakhtarg@gmail.com;
zarifbinakhtar@ieee.org

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