# RESEARCH AND DEVELOPMENT IN MECHANICAL ENGINEERING THROUGH ANDROID APPLICATION

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## I. Introduction

***Android is a mobile operating system developed by Google, based on a modified version of the Linux kernel and other open source software and designed primarily for touch screen mobile devices such as smart phones and tablets. In addition, Google has further developed Android TV for televisions, Android Auto for cars, and Android Wear for wrist watches, each with a specialized user interface. Variants of Android are also used on game consoles, digital cameras, PCs and other electronics.***

***Initially developed by Android Inc., which Google bought in 2005, Android was unveiled in 2007, with the first commercial Android device launched in September 2008. The operating system has since gone through multiple major releases, with the current version being 8.1 "Oreo", released in December 2017.***

## II. Research and Development

R&D is the back bone of every nation to became a progressive one. Every moment there is a new product development or up gradation or development of a existing product. The data requirement ,data management and of course data availability is a bare necessity for developing any product. Android is an application through which data management and data accumulation can be carried out effectively with output base solutions for desired activities .

## III. Apps developed in Mechanical Engineering

**EngCalc ,** includes formulae and property tables for mechanical, hydraulic, structural, machine design, electrical, fluid mechanics, heat and mass transfer, thermodynamics, HVAC, pipe flow, and automotive. It also integrates a unit convertor with units and conversions.

**The CAD View 3D MFC**, enables the user to rotate 3-D renderings with the touch of a finger. Image: CAD View 3D MFC

**Heat Transfer Calculator**, offers calculators related to heat transfer calculations. The calculators include a conduction and convection calculator which calculates the conduction and convection phenomenon and outputs the temperature or heat transfer rate. It also allows unit conversion of heat transfer-related units from Metric to English
units.

**Engineering Unit Converter,** is an engineering unit converter that allows engineers to choose a category such as length, energy, entropy, electric charge, etc., from a list. The available units appear in two spinning wheels and you can change the input value in the yellow field, sort units, or use the swap button.

**Fluid Mechanics Converter**, is a conversion calculator that can translate different units of measure related to fluid mechanics. The app includes a fluid converter, flow rate (mass) converter, flow rate (volume) converter, viscosity (dynamic) converter, viscosity (oil and water) converter, and a viscosity (kinematic) converter.Engineers are able to simulate design options during the concept phase using Autodesk's ForceEffect , Motion app. Image: Autodesk Engineering Cookbook is a reference guide for mechanical designers. It provides access to frequently needed information, including heating and cooling load estimating; sound and vibration guidelines, ventilation rates for indoor air quality; and design formulas and conversion factors.

**Mechanical Engineering 101**, is an on-the-go learning app that helps you to understand the basics of "Mechanical Engineering 101." The app provides bite-sized learning through tutorials, quizzes, and flashcards. CAD View 3D MFC is a 3-D data file viewer designed for CAD users. It supports the most popular 3-D CAD formats including STL, DXF, and JT. With help of this app, users can take their 3-D files with them no matter where they are and view them with their phone directly. The app provides 3-D features including rotating model with finger movement, changing object material color or rendering background color, and changing rendering light intensity.

**Autodesk Force Effect,** Motion app allows engineers to develop functional moving mechanical systems right on their mobile devices. Unlike the traditional approach of using paper, pencil, and a calculator to develop equations for design options, the app does all the simulation and engineering calculations on mobile device, enabling engineers to simulate design options during the concept phase to determine the viability of a design.

## IV. Major classification

**Conceptualizing: Under** this Android app development step, the service provider works towards understanding the actual requirements. Based on that, on should proceed towards forming the goal of the entire app development process. Once indicated the objectives and ideas pertaining to the app being developed.

**V. Wire-framing**

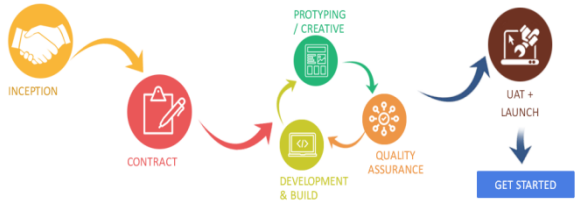
In the next stage, the wire-framing stage, the developers make a blue print of the structure of the app for the reference. It includes details of the platform, features, feasibility and specifications. This stage makes it easy to ensure that the Android app development process is in synchronized with the requirements.

**VI. Design**

Of the Android app development steps, this is the stage where the mobile interface design team works towards formally defining the application and rechecking, ensuring that all the bases are covered. The team considers all parameters necessary for developing the app successfully.

**VII.** Steps **to be followed for developing the apps**

Step 1: A great imagination leads to a great app
Step 2: Identify
Step 3: Design your app
Step 4: Identify approach to develop the app - native, web or hybrid
Step 5: Develop a prototype
Step 6: Integrate an appropriate analytics tool
Step 7: Identify beta-testers. Listen to their feedback and integrate relevant ones
Step 8: Release / deploy the app
Step 9: Capture the metrics
Step 10: Upgrade your app with improvements and new features




**I. Further Developments :**

Coming to further developments, problem formulation for different issues as per societal requirement to be clubbed . The available resources ,economic viability, environmental impact ,cost of manufacturing, durability ,patenting facility, intellectual property right ,etc, are to be gathered through android application . The application can able to show a revolutionary landmark in R & D activities in the field of mechanical Engineering .

**Reference**

[1] Gartner, "Gartner: 1.1 billion android smartphones, tablets expected to ship in 2018," Online; accessed at Jan 5, 2018, http://tinyurl.com/n8t3h9y.
[2] Victor, "Android's google play beats app store with over 1 million apps, now officially largest," Online; accessed at May 12, 2017, http://www.phonearena.com/news/Androids-Google-Play-beats-App-Store-withover- 1-million-apps-now-officially-largest id45680.
[3] "Number of available applications in the google play store," 2018, http://www.statista.com/.
[4]W. Rothman, "Smart phone malware: The six worst offenders," Online; accessed at April 17, 2015, http: //www.nbcnews.com/tech/mobile/smart-phone-malware-six-worst-offenders-f125248.
[5] "Bit9 report: Pausing google play: More than 100,000 android apps may pose security risks," 2012, https://www.bit9.com/files/1/Pausing-Google-Play-October2012.pdf.