

# Software Group Project

Team Members: **1) Raj Bheda (19IT013)**

## 2) Manav Butani (19IT016)

CerGen

## A Complete Certificate Generating Solution

**Abstract:**

Creating Certificates is a tedious task for each individual, the problem scales to a larger extent for popular events as facilitating certificate to each and every participant become a boring task so this problem can be solved by “CerGen” app which takes excel sheet as input and prepare a set of certificates by automatically inputting the details in certificates. Each certificate generated would be allotted a unique identification number which stays with the certifying authority to check the originality of the certificate anytime in future.

# Introduction:

CerGen is created to solve the problem of manual certification preparing methods that most of the institutions follow for their events and even that consumes so much time but also provides no guarantee of authenticity of certificates. CerGen is easy to use application which is built using Flutter in Dart programming language so it has a cross-platform build advantage, i.e. target multiple operating systems from a single codebase.

It is powered by a State Management Architecture- “Provider” which is recommended by Google for managing the local and global states of application. It is the most advanced topic of Flutter development and makes code more readable and debuggable.

It ensures authenticity by implementing a cryptographic hashing algorithm HMAC (Keyed-Hash Message Authentication Code) which will generate a unique identification number(UID) by taking two inputs - name of person certified and a secret encryption key only known to the certifying authority. So the certifying authority can verify if the certificate is legitimate or a fake one by reverse checking the hash with the secret key which was used to generate UID.



# Literature Survey:

It is observed that the institutions want a larger number of applicants for their events so that they can reach to a wider range of communities and create a greater impact. Many applicants join in order to learn something and get a certificate which stays as proof that the particular person has attended a so-called event. Several times it happens that institutions get a large number of applicants but the aftermath of the event is not the same, its tedious as manually preparing certificates is not a productive task and most institutions skip certifying the applicants in the provided scenario.

Even if some institution with a large workforce manages to provide certificates to all the applicants but the question of authenticity of certificates arises. What if someone tweaks the name of the applicant and misuses this certificate for his/her advantage?

These were the large scale issues that most institutions face and to solve the problem, “CerGen” App was developed by which multiple number of certificates can be generated in a blink of an eye and by implementing cryptographic hashing algorithm HMAC, it provides authenticity of certificates.

# Technical Specifications:

### Target Platform:

Android & iOS.

### Tech Stacks to be Used:

* **Frontend:** Flutter.
* **Editor:** VS Code / Android Studio / Xcode.

### Domains Covered:

* Cross-Platform App development.
* File Management.
* State Management.
* Cryptographic Hashing.



# References:

* [Flutter Docs.](https://flutter.dev/docs/)
* [SpreadSheet Decoder.](https://github.com/sestegra/spreadsheet_decoder)
* [Provider State Management Architecture.](https://pub.dev/packages/provider)
* [PDF Viewer.](https://pub.dev/packages/pdf)
* [Sharing files with Flutter.](https://pub.dev/packages/share_extend)
* [HMAC Algorithm.](https://en.wikipedia.org/wiki/HMAC)

# Conclusion:

By this project we learnt how state-management actually works in Flutter, working with file management, working with decoding spreadsheets, reading and writing .pdf files through code, cryptographic hashing algorithms, sharing files to different platforms, etc. We’ve also got experience with the Version Control System as we hosted our codebase on GIT. It was also beneficial to us as it helped us to show insights of project management while working with a team.