This thesis is about the development of an IoT-Enabled Universal Authentication Platform. It is a product that can authenticate a person for multiple modalities, even under harsh conditions. Multiple modalities include fingerprint authentication and acoustic ear canal-based authentication.

In Chapter 1, the Pre-study phase of the project is explained in detail. The ideas and aspects that led to taking up this project are mentioned. Different surveys like product, market, and user are part of this chapter. The functional characteristics and performance aspects we wish are covered.

In Chapter 2, the functional concept of the overall product is explained with modules and submodule working description. In addition, how the significant emphasis is given to industrial design is explained. Finally, it ends with the target scope.

In Chapter 3, the detailed design of the product is thoroughly discussed, covering hardware and software designs. The design of different modules and sub-modules is also explained along with circuit-level understanding.

In Chapter 4, the product structure which includes the complete hardware from PCB designs to assembly are discussed. Software algorithms and their thorough explanation and also system integration part are understood. The list of components and the vendor list are also attached.

In Chapter 5, the entrepreneurial plan of the product is detailed covering an overview of the venture, market analysis, competitive analysis, business model, operational and financial plan, risk analysis, and mitigation strategies.

In Chapter 6, the user instructions are discussed thoroughly. The complete functioning of the system is explained. Product limitations and the future scope are also provided.