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SAL EDUCATION

SAL INSTITUTE OF TECHNOLOGY AND ENGINEERING RESEARCH

Department of Electronics and Communication Engineering

&

Department of Instrumentation and Control Engineering

Report

of

Orientation session

on

Prototype, Design, Process development for Business Model

15th February, 2021

Director & Principal: Dr. Rupesh Vasani

Head of Department: Prof. Jigar S. Barot

Conducted by – Mr. Markand Pathak

Coordinated by – Prof. Sunil Nayak

Prof. Kuldeep Shukla

The online session was organized as part of Institutions Innovation Council calendar activity on google meet platform on 15th February, 2021, Monday for all the students of Electronics and Communication Department and Instrumentation and Control Engineering Department. Students and faculty members of Electronics and Communication as well as Instrumentation and Control Engineering were as a part of this event.

The speaker Markand P. Pathak who is a well-known for his startup and he is the co-founder of SUDAKSH Technologies since 2017. He has been engaged in design and development of UAV Technologies having main responsibilities of conducting and manage ongoing R&D on flight computers and Embedded systems required for UAV operation.

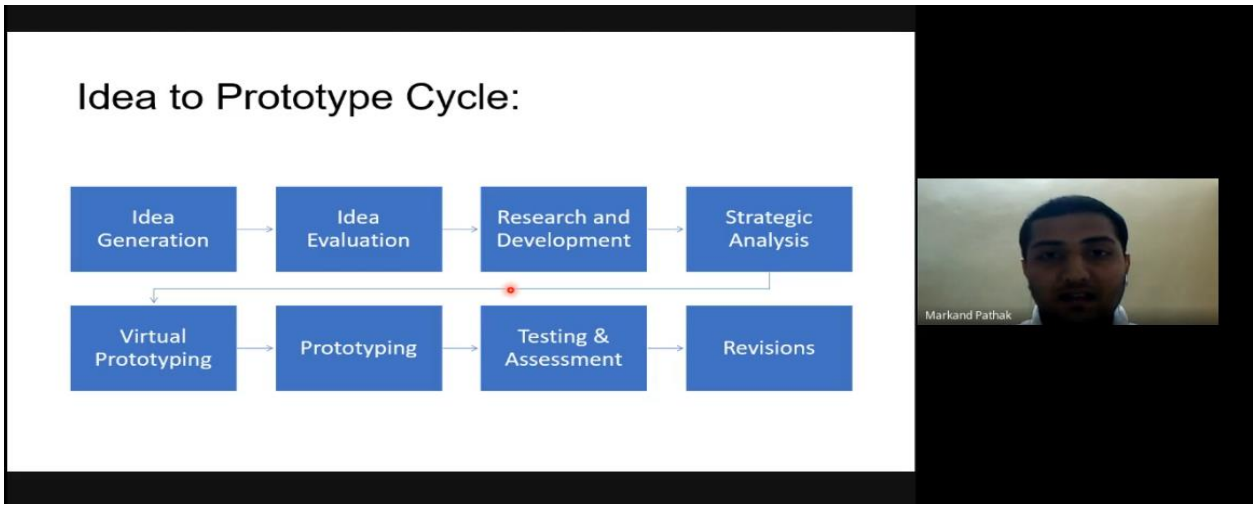
He is also head, R&D, StrautX Technologies since 2018 which is allied in design and development of concentrated solar power plants having main responsibilities of conducting and manage ongoing R&D on Concentrated Solar Power Plants and its subsystems. After post-graduation at PDPU, he is in the research field of Aerodynamics, Fluid Solid Interaction, Avionics, Dynamical Control of Aircrafts, UAVs, Flight Computers.

The session was pertaining to prototype generation from an idea and how to implement them in time with keeping production in mind.

How the product has been designed was clearly taught, students enjoyed the way the design process was being described.

Steps include: -

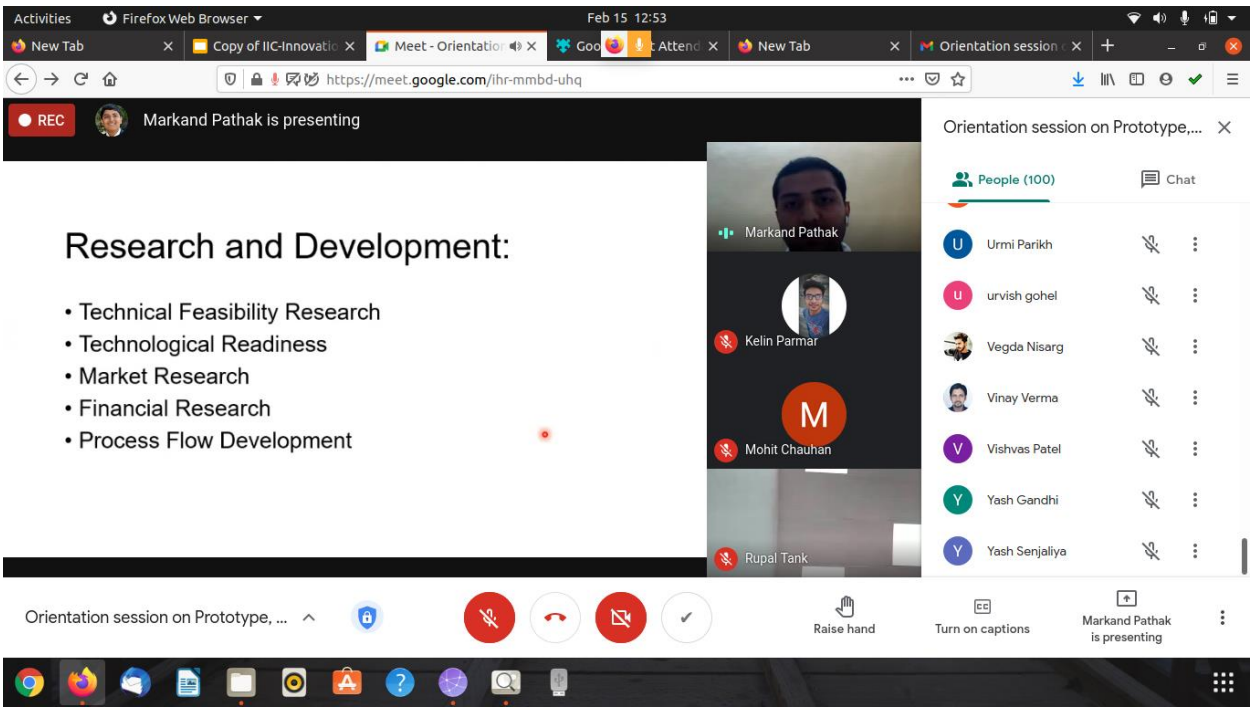
1. Idea Generation
2. Idea Evaluation
3. Research and Development
4. Strategic Analysis
5. Virtual Prototyping
6. Prototyping
7. Testing & Assessment
8. Revision



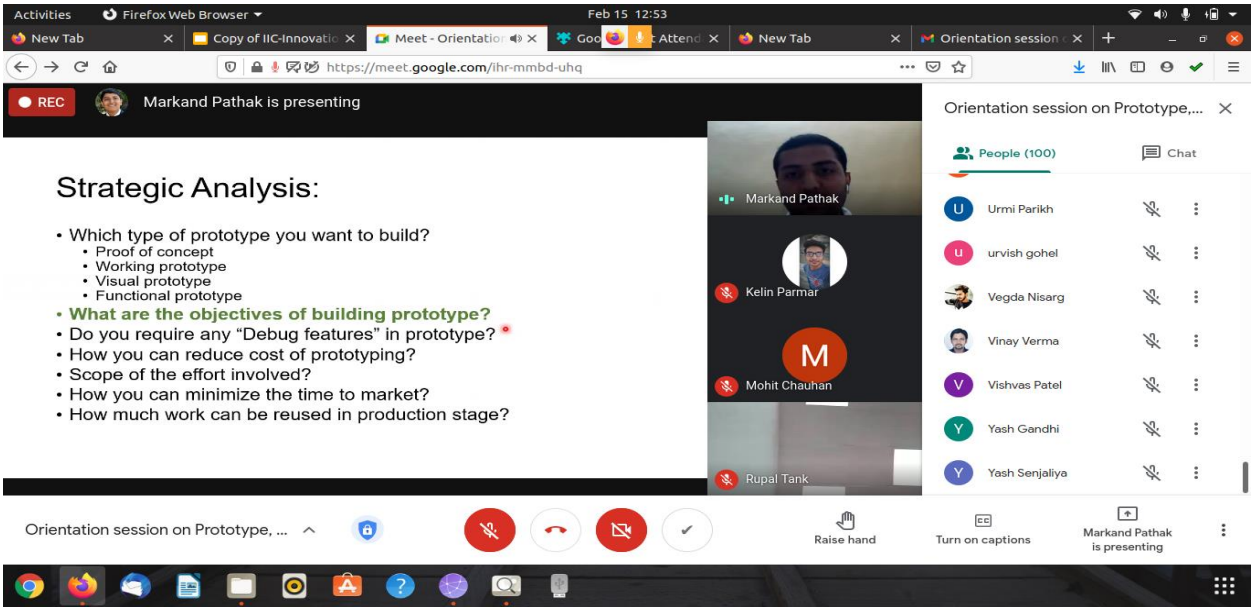
How the design process initially began with the ideas and which role one needs to play in planning was also discussed.

Idea evaluation means how it is viable to the implementation, cost-effective and commercial use.

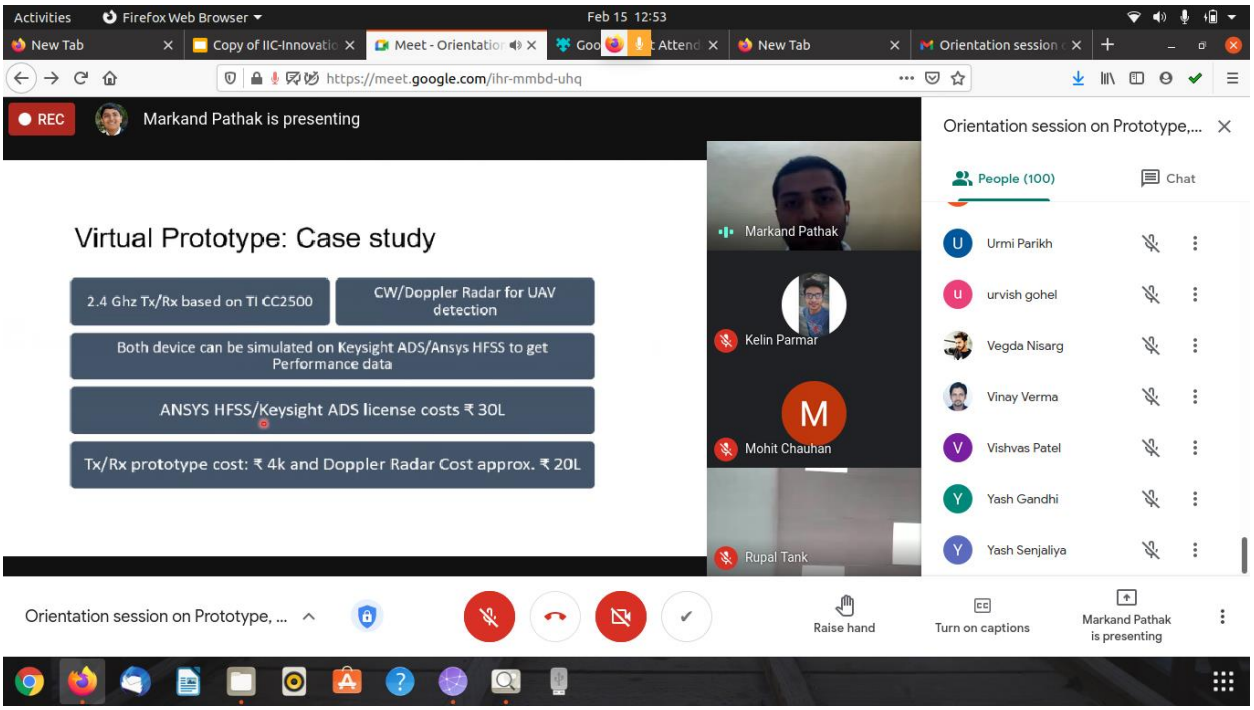
Some research work is necessary for implementation with a view to prototyping.



After that Strategic Analysis comes into the picture and define time bounds for the stages of implementation.



The use of virtual prototypes significantly shortens the design cycle and reduces the cost of design. It further provides the designer with immediate feedback on design decisions which, in turn, promises a more comprehensive exploration of design alternatives and a better performing final design.



Phases of Prototype Model

The following are the primary phases involved in the development cycle of any prototype model.

Initial Communication – In this phase, business analysts and other individuals responsible for collecting the requirements and discussing the need for the product, meet the stakeholders or clients.

Quick Plan – Once basic requirements have been discussed, a quick plan of the initial prototype is made.

Modeling Quick Design – User interface part i.e., designing part of the prototype is carried out in this phase.

Development of the Prototype – In this phase, the designed prototype is coded and developed.

Deployment, Delivery, and Feedback of the Prototype – In this phase, the initial prototype is deployed and is accessible to clients for its use. Clients review or evaluate the prototype and they provide their feedback to the requirements gathering and development teams.

Above mentioned phases keep repeating until the replica of the final product is deployed.

Final Product Design, Implementation, Testing, Deployment, and Maintenance – Once the client finalizes a prototype, on the basis of the prototype, the final product is designed and developed. This developed product is tested by the testing team and if it is ready to go LIVE, the product is deployed and is available for end-user.

Types of Prototype Model

Developers can choose from available prototype model types based on the product's requirements that have been covered in this section, let's look at them.

Rapid Throwaway Prototyping – In this method, the prototype is developed rapidly based on the initial requirements and given to the client for review. Once the client provides feedback, final requirements are updated and work on the final product begins. As the name suggests, the developed prototype is discarded, and it will not be part of the final product. It is also known as close-ended prototyping.

Evolutionary Prototyping – In this method, a prototype is made, and the client feedback is received. Based on the feedback, the prototype is refined until the client considers it the final product. It follows an incremental development approach and saves time compared to the rapid throwaway prototyping method as in evolutionary prototyping old prototype is reworked rather than developing a new prototype from scratch. It is also known as breadboard prototyping.

Incremental Prototyping – In this type of prototype model, final product requirements are break into smaller parts and each part is developed as a separate prototype. In the end, all the parts (prototypes) are merged which becomes a final product.

Extreme Prototyping – This type of prototyping model is mainly used for web applications. It is divided into three phases-

First basic prototype with static pages is created, it consists of HTML pages.

Next, using a services layer, data processing is simulated.

In the last phase, services are implemented.

Advantages of Prototype Model

- Prototype model offers the following benefits-
- Quick client feedback is received which speeds up the development process. Also, it helps the development team to understand the client's needs.
- Developed prototypes can be used later for any similar projects.
- Any missing functionality and any error can be detected early.

- It is useful when requirements are not clear from the client's end, even with limited requirements, the development team can start the development process.

Disadvantages of Prototype Model

Apart from appealing advantages, the prototype model has many disadvantages that are listed below-

- It is a time-consuming process or method as multiple prototypes might be needed until the client reaches the final requirements. The Client may not have an explicit idea about what they want.
- This method involves too much client interaction and involvement, which can be done only with a committed client.
- In the beginning, it is a bit difficult to predict the exact amount of time needed to reach the final product.
- While coding, developers do not have a broad perspective of what is coming, because of which they might use an underlying architecture that is not suitable for a final product.
- To produce the quick prototype, developers might make weak decisions during the development process (especially implementation decisions), and compromise on quality which might eventually affect the product.

The session was concluded with the vote of appreciation.
Event Details: -
Date: 15th Feb,2021; Mode: Online; link: https://meet.google.com/ihr-mmbd-uhq hosted by Prof. Sunil Nayak
Total Number of Students: 101
Total Number of Faculty Members: 8
Total Number of External Participants: None