Institutional Best Practices

1. **Title of the Practice:** ProtoSem – Prototype Semester

2. **Objectives of the Practice**

   ProtoSem is an Open Innovation Fellowship Program, designed and developed by KCT-Forge Academy embedding an innovation-centred approach to engineering education. The program enables students with the necessary skills and competencies to solve real-world problems and develop tech-enabled solutions for the needs of industry, corporations, startups, and society.

3. **The Context**

   ProtoSem imparts practical, conceptual knowledge through co-creation opportunities, which has proven to enhance the employability of students and sets towards an accelerated career path. Students spend 20 Weeks in the integrated Lab Ecosystem that enables them to develop solutions using 3D Printing, Embedded Systems, ML, Robotics, AR/VR, and IoT. Students are trained by Experts through training sessions & prototyping that gives hands-on exposure with Agile Methodologies and Product Management. Selection of students is carried out through a 3 step process, considers student's curiosity, learnability, drive, and attitude.

   - Help students understand the importance of Innovation skills
   - Learning from the traditional system for a transdisciplinary program
   - Time consuming process of selection evaluates the student under various verticals of problem solving, mindset to team player

- Scholarships/Financial supports are given to outstanding meritorious students
- Leverage learning advanced technologies and build a Minimum Usable Prototype

400+	**Step 1** Call for Application
250+	**Step 2** Online Test
120	**Step 3** 42 Hr Non-Stop Hackathon
60	**Step 4** Personal Interview

4. **The Practice**
   - **Learning by doing** is to learn the process of innovation by doing
   - **Values & Ethics:** Innovation Engineers learn and implement agile practices to be self-sufficient to manage and impart right ethics
   - **Product Innovations:** Students work in transdisciplinary teams go through a defined process for developing a product innovation
   - **Skill building**: Rubrics showcase the key skill areas defined in various technologies to catalyse product innovations and to crate innovation engineers
   - **Co-create with Industry/Start-ups** - Teams interact with industry/start-ups on a regular basis, understand and align to product innovation with agile methods on a day-to-day basis
   - **Curriculum** is built by the best practices used in industry, facilitated by industry experts

Uniqueness

Market Place - Challenge statements are shared to select the challenge. Team identifies Visionary - who leads the team, Hacker - does technical job to outcomes, Designer - brings a creative approach to solutions.

Values and Corporate Practices - Students are trained on project management tools to Plan, Organise, Review, Meet and discuss day to day action plans and execute the work in the most effective manner.

Zen Pencils is an online showcase to feature illustrations taking on famous quotations and making a visual style to create a story. Students choose a comic strip that suits/inspire enough to pursue their life dreams. This activity helped to understand, identify individual's goals and aspirations.
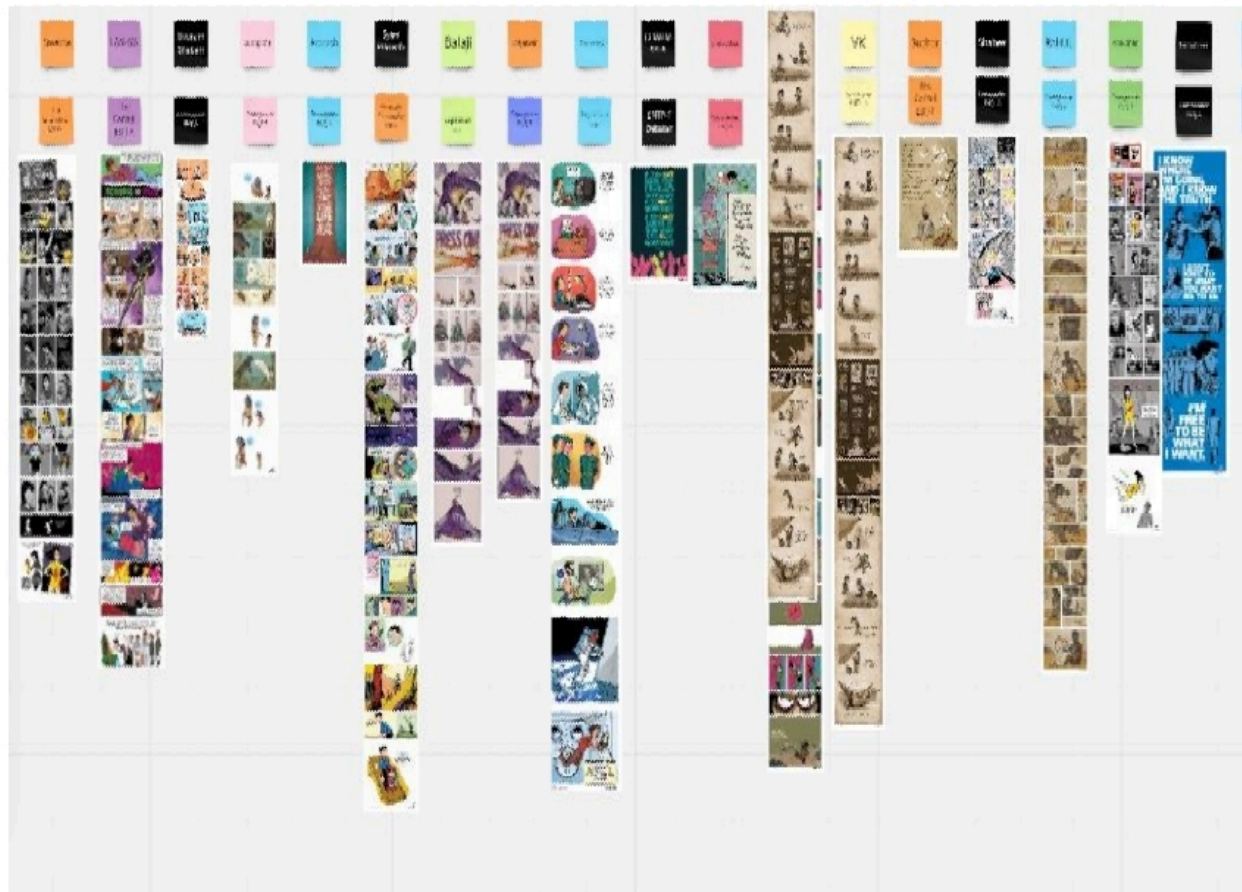
16 - Personalities Circle is a psychometric test to learn what drives, inspires, and worries different personality types, helping to build meaningful relationships within cohort. It helps to make the best possible combination of people in a team. This activity is carried out at the start and end of *ProtoSem* to show them how their personality has improved and showcase how awesome they are.
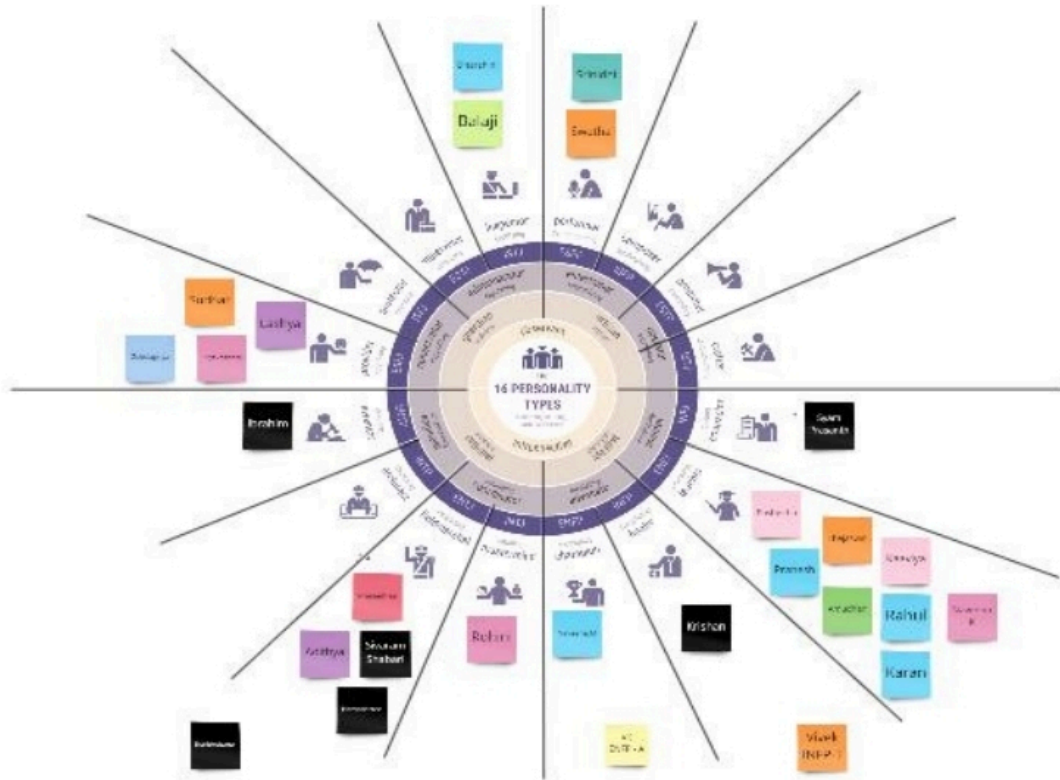
Collaborative Cohort aims to break stereotypic behaviours of individuals and process to look for new friends, new people, new ideas and accept newer ones with open-mindedness to achieve team outcomes.

Beta Team 2						
Team 1	VK	Balaji R	Rahul			
Team 2		Ibrahim	Krishan	Rohini	Priya S	
Team 3	Vivek			Pranesh		
Team 4		Sivaram Shabari	Dharshini			Abinaya
Team 5			Naveena K	Amudhan	Srinidhi	Lashya
Team 6	Vivek	Adithya	Syam Prasanth		Pushpitha	
Team 7	VK	Desingh Paal R	Swetha	Sreeragh Sumon	Kaaviya	
Team 8		Nivitaa R		Karan	Kevin Kumar R	

Movie Time is a part of ProtoSem, imparting some important lessons by on-screen performances. Movie titles include Spare Parts starring George Lopez, which sets the life at ProtoSem and expectations. Coach Carter, Remember the Titans, Internet's Boy and Ted Talks are other screenings that happen.

Game Nights are introduced to international board games to build stronger relationships with fellow teammates and resilient cohort. This helps in identifying key personality traits of individuals and Four major games include RISK - Game of Global Domination, Pandemic, Resistance and Scotland Yard.

Agile Game

Marshmallow Challenge

Longest Floating Paper Flight

- **Drawsaurus** opens up the minds and getting adapted to ProtoSem culture. With learning & fun, students break boundaries of emotional barriers and increase productivity.

5. Evidence of Success

From 9 batches of ProtoSem, there were 345 Innovation engineers trained to develop 81 product innovations. From these, 4 teams have filed patent applications and 4 teams have registered to be a start-ups. Around 30 Lakh investment was raised from Corporate and Government Organisations. 86 innovation mentors from various domains, mentored to develop their MUP.

345 Innovation Engineers

4 Patents Published

81 Product Innovations

4 Startups

27 Industry Partnership

30L Investment Raised from Corporate / Govt organizations

86 Innovation Mentors

Product Innovations

Smart Glove for Assisted Physiotherapy

iSpecs [Intelligent Spectacles]

Individual Protection System with built-in sensors

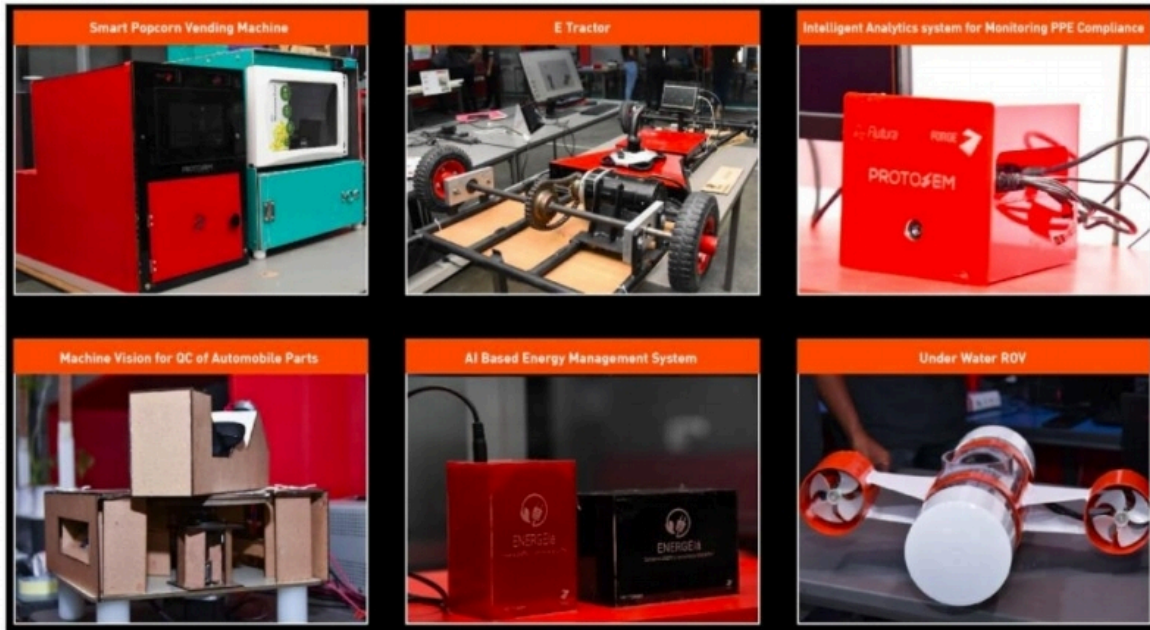BOT for Solar Panel Cleaning and Monitoring

Automated Rail Monitoring for NDT Fault Detection

Battery Swapping BoT for Drones

Funded Startups/Innovations

Smart Popcorn Vending Machine | E Tractor | Intelligent Analytics system for Monitoring PPE Compliance

Machine Vision for QC of Automobile Parts | AI Based Energy Management System | Under Water ROV

Corporate-sponsored Innovation Fellowship

10 Innovation Engineers bagged employment at ThoughtWorks after a rigorous internship and interview. To identify potential candidates from the current Cohort, students across various academic institutions underwent Innovation Bootcamp. During the Boot Camp various workshops, organized to upskill and competencies required for selection were supported by the ThoughtWorks.

Based on expert suggestions, selected students underwent rigorous training on specific skills and competency development on the best practices and processes. It was practised under the mentorship of experts and developers. ThoughtWorks acquires potential interns/employees based on their exceptional performance during their internship.

Innovation Engineers placed at ThoughtWorks through Fellowship

Differential Employability

With network of start-ups and industrial connections spanning across different sectors, ProtoSem provides visibility and access to employability opportunities. This network shares technology discussions, events notifications and others in the context of engineering and product.

6. Problems Encountered and Resources Required.

- Most of the courses are handled by industry professionals where session planning is important
- Requirements of Program Interns is mandatory in order to support the teams for their product innovations
- High end hardware labs and work tables required for MUP development
- During pandemic, *ProtoSem* Experience Kit was developed to learn, play and execute their learning outcomes

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Dr. D. SARAVANAN, M.Tech.,Ph.D.,
PRINCIPAL
Kumaraguru College of Technology
Coimbatore - 641 049.