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(Autonomous)
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7.2 - Best Practices

I. Best practice-I

Title of the Practice: Innovative Research Addressing Contemporary Societal Needs

1. OBJECTIVES OF THE PRACTICE

CBIT initiated the multidisciplinary project **"Indo-American Artificial Heart Program" (IAAHP)**, a philanthropic research collaboration that unites medical and engineering expertise to develop a low-cost left ventricular assist device (LVAD). This centrifugal blood pump is designed for cardiovascular support, aiming to make life-saving technology affordable.
Key objectives include:

a. Promoting a culture of applied and contemporary research in the institute.
b. Encouraging exploration of societal needs and identifying high-impact research areas
c. Formulating engineering problems with actionable solutions.
d. Motivating faculty to secure external or in-house funding based on pilot project outcomes.
e. Develop extracorporeal heart-assist system, manufactured in India, for clinical use to meet the critical need for this life-saving technology in India.
f. Organize and capitalize upon technical, medical and manufacturing resources the Hyderabad region to work together to translate their knowledge and expertise to a viable medical product.
g. Demonstrate to the World that safe and effective heart-assist technology can be produced cost effectively, and affordable in low-resource settings.
h. Future Goal: Develop durable, implantable heart-assist system. See separate DHF.

Creativity is essential for research and entrepreneurship. Although CBIT's motto, **"Swayam Tejaswin Bhava,"** emphasizes self-empowerment, the focus was traditionally on teaching and learning. Recognizing the need for impactful research, CBIT established an exclusive **Research & Entrepreneurship (R&E) Cell** equipped with state-of-the-art infrastructure. Academic autonomy, granted in 2013, enabled CBIT to align research practices with societal demands. Against this backdrop, CBIT launched the **Indo-American Artificial Heart Program (IAAHP)**, a collaborative initiative involving esteemed national and international institutions such as:

- CBIT
- SHARE INDIA

- SNIST, KITSW, AIG Hospitals, Palamuru Bioscience
- Laxven Systems
- University of Pittsburgh, Cornell University, USA

This multidisciplinary project leverages expertise across institutions to design and develop a cost-effective LVAD.

2. THE CONTEXTUAL FEATURERS AND CHALLEGING ISSUES

i. To make the pump long lasting we have eliminated the bearing and seals. Which are the major cause of heat generation and it eventually is wear out which decrease the life of the pump. To resolve this problem, we came up with a solution to use magnetic coupling to transmit the power for the motor to the impeller. And we have worked on a number of designs to make the impeller stable and pump the fluid efficiently. Almost 30 prototypes of centrifugal pump impellers, casing and blades were printed and assembled.

ii. Adopting computational methods such as CFD and FEA is the key tool used to analysis the blood flow in the pump and it help to study the fluid flow in the pump, and help to find out the high shear regions in the pump. And by redesigning we can reduce the high shear regions in the pump. High shear regions are which damages the RBC's (Red blood cells) and leads to thrombosis.

iii. Procurement of suitable magnets for the impellers

iv. Setting up of a mock circulatory loop, for hydrodynamic and hemolysis testing of the 3d printed prototypes, which replicated the human circulatory system giving a flow rate of 5.0 lpm and pressure head of 120mmHg.

v. Incorporating and learning medical terminologies and in-vitro clinical trials for establishing biocompatibility standards.

vi. Search for a suitable industry for the manufacture of injection moulded pump parts.

vii. Selection and procurement of an appropriate biocompatible adhesive for joining the pump top and bottom casing.

viii. Establishing a semi-automated set up for dispensing the adhesive along the pump casing.

ix. Training the surgeons for animal trials using commercially available pumps and finally animal trials using the manufactured pump.

3. DESCRIPTION

Various versions of the pump were designed using SolidWorks and computational analysis was done using ANSYS Workbench. The pump is designed to deliver a flowrate of 5.0 LPM and a pressure head of 120 mmHg for LVAD setting and 500 mmHg for ECMO setting. SLA 3D printer was used for rapid prototyping.

Fig.1: 3D Printed pump bottom casing

The CAD models of the pump parts were sent to a manufacturing facility in Hyderabad. The material used for the pump components is Poly Carbonate (PC). A die was machined as per the designs for pump casing and impeller. The injection molded parts were inspected for dimensional and design accuracy and surface roughness. Design changes and modifications were noted and executed. Polycarbonate injection-moulded pump casing and impeller were joined using various types of adhesives, manually using a syringe and later with a 3D-Printer robotic arm. The Hyrel 3D printer uses interchangeable heads attached to a stepper motor with a syringe, to print the desired object. The CAD model of the glue path was generated in SolidWorks, and converted to 3D Printer compatible STL file. This file was opened in the Hyrel 3D printer software 'Repetrel'. Repetrel was used to make adjustments, calibration and control the print with G-Codes. Pump Fixtures: In order to place the pump bottom casing on top of the printer bed, and to a join the top casing after adding the glue, top and bottom casing fixtures were modelled and 3D printed using ABS material. The fixtures ensured proper alignment of the injected glue with the glue path on the bottom casing and also precision while placing the top casing on the bottom one. Dymax 1201(viscosity=8000cP), a biocompatible UV curable adhesive was selected to glue the pump casings together. This is blue in color and turns clear upon UV curing. It was cured under UV light in the 'Form Cure' UV equipment (wavelength=405nm). The pump casing was further modified to a tongue and groove arrangement. UV curable glue was injected in the groove of the bottom casing and top casing with the tongue was added on top. The casing was designed in a way that the excess glue did not spill inside the casing and instead came out. The pump casing was 3D printed in an SLA printer for trials. The glue was successfully added and the top casing attached with the robotic arm without any spill inside. The glue was UV cured using Form Cure UV equipment.

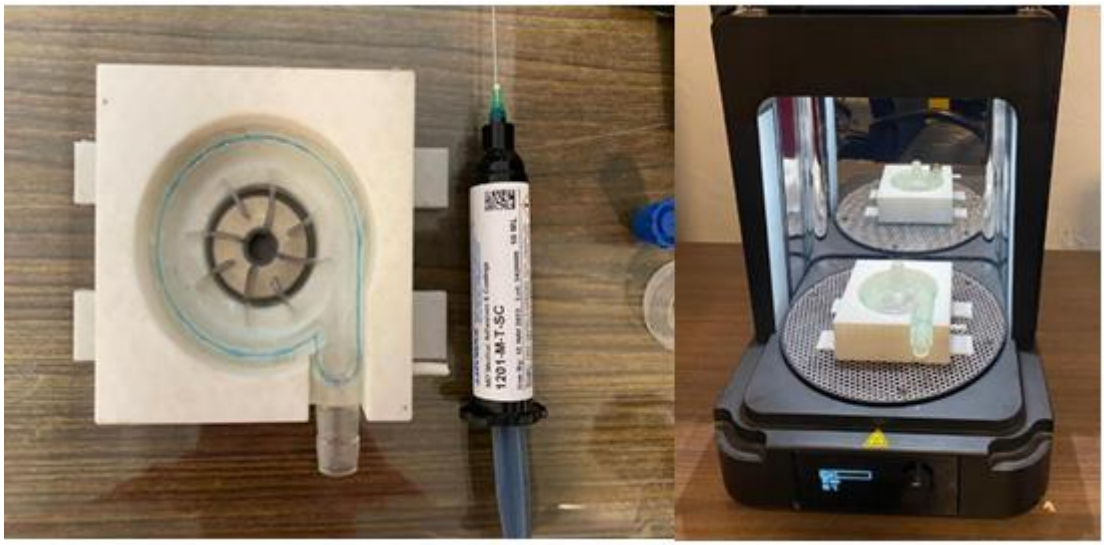


Fig.1.2: Glue added to clear 3D printed pump and cured in UV chamber

Hydrodynamic Testing of Glued Casing: All the glued pumps were tested in the mock loop setup for 4 hours. There was no evident leakage in any pump throughout the test. The test parameters were;

i. Flow rate= 5.0 LPM
ii. Differential Pressure for LVAD setting=110 mmHg
iii. Differential Pressure for ECMO setting= 500 mmHg

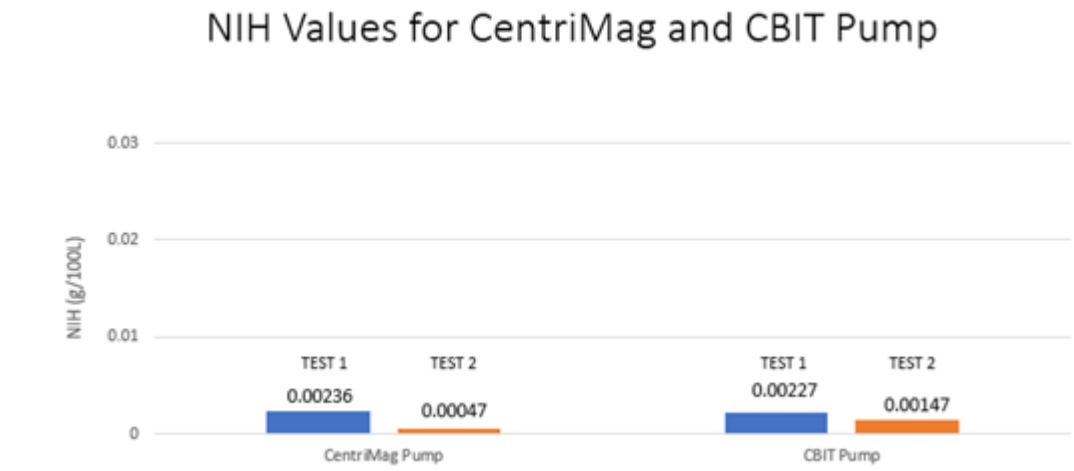
Fig.1.3: Hydrodynamic Testing

4. EVIDENCE OF SUCCESS

a. Hydrodynamic tests showed good results as the flow rate achieved was 5.0 lpm and pressure head was about 120mmHg, which replicated the left ventricle function of the heart.

b. Hemolysis tests were performed on the standard Centrimag pump and 3D-printed prototype. The normalized index of hemolysis was calculated and the prototype achieved NIH very close to the Centrimag.

c. The Hyrel 3D printer, as shown in the figure below, in CBIT was successfully used as a glue dispensing robotic arm. The G-Codes were modified as per the glueing path and the pump top and bottom casing were assembled. The fixtures for the pump were also 3D printed.



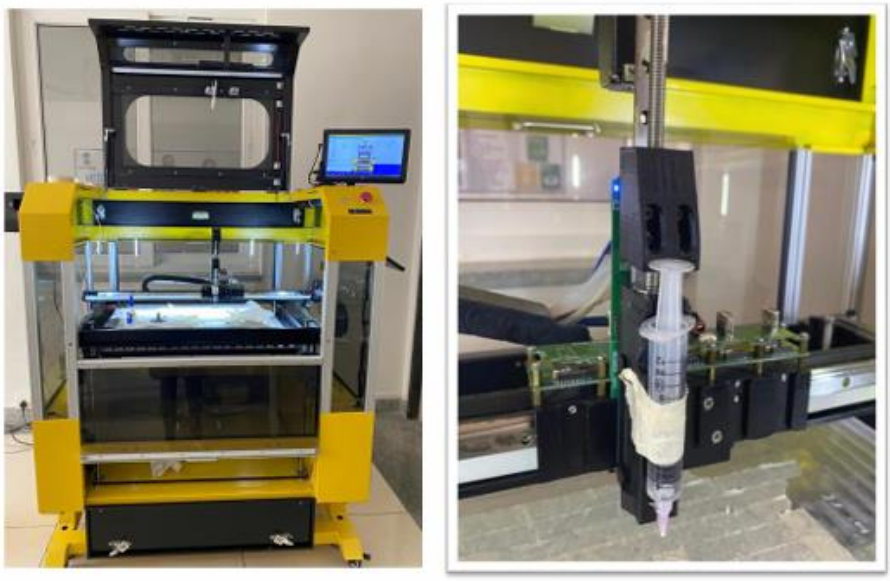


Fig.1.4: Hyrel 3D printer with fixurers

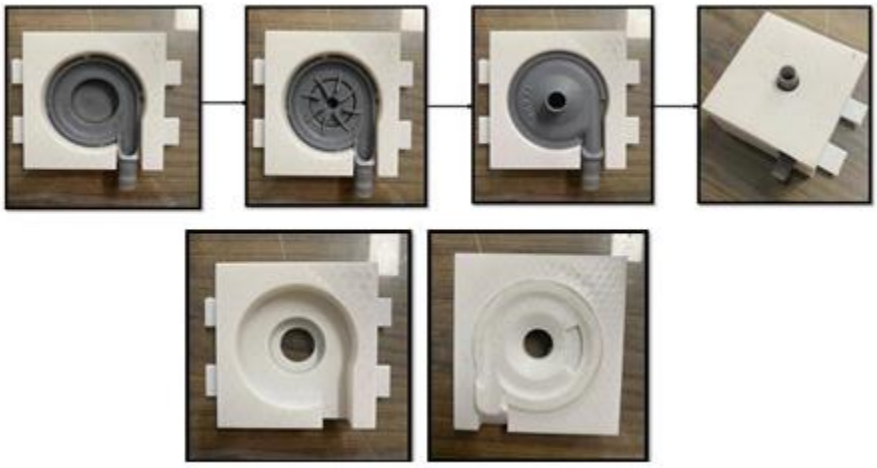
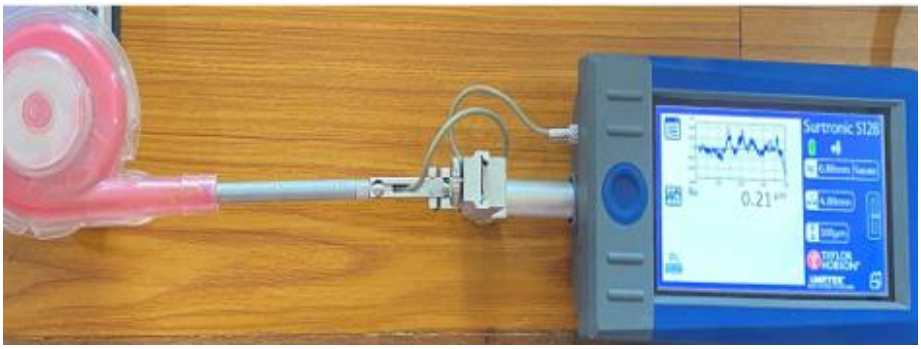
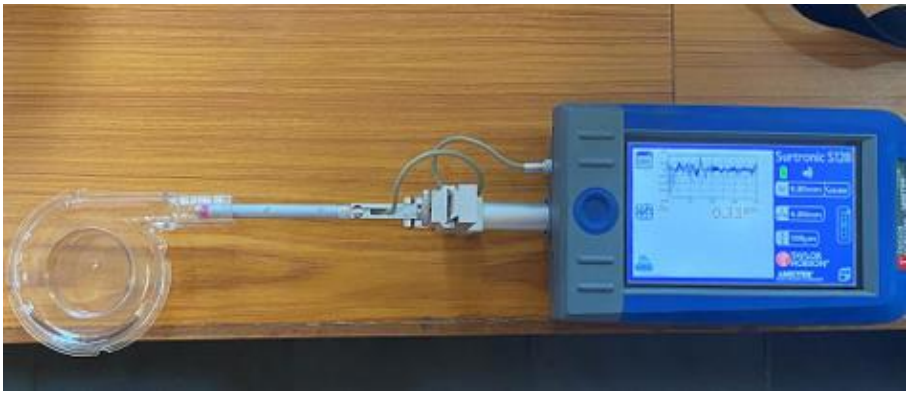


Fig.1.5: Pump top and bottom casing fixtures for gluing

d. The initial injection moulded parts were successfully manufactured at a facility in Hyderabad. For the initial testing and trials, these pumps were effective with a good surface finish. The surface roughness value (Ra) for Centrimag (control) = 0.21 microns and Ra for injection moulded pump = 0.33 microns.

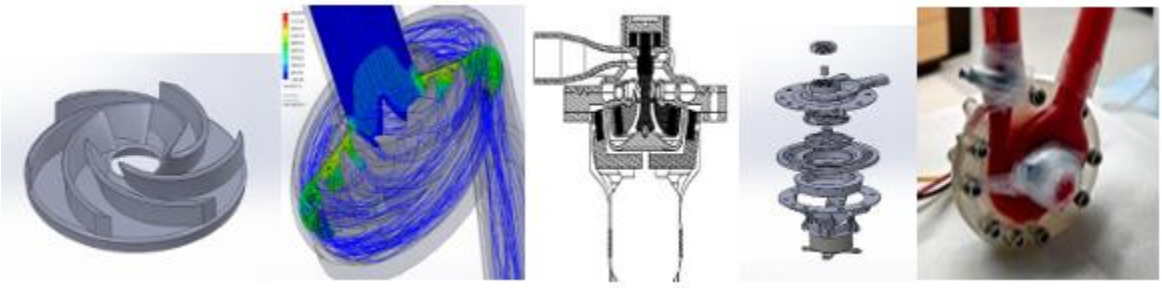


1.6a: Ra=0.21 for Centrimag

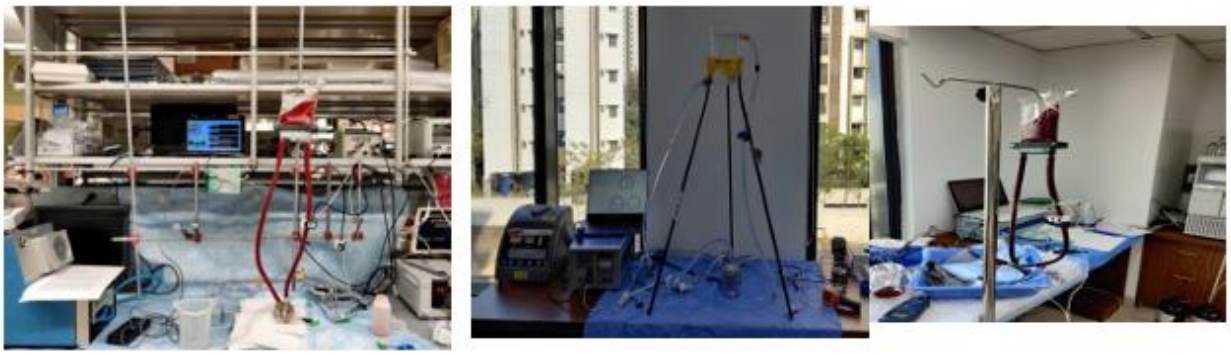


1.6b: Ra=0.33 for Injection Moulded Pump

e. The role of CBIT in the project is to develop a blood pump so that it runs continuously for a long time reliably inducing minimum possible shear stresses. The pump is designed and developed. The pump is tested with human blood. Animal testing is also completed. Once clinical testing is over, the product can be marketed.



1.7: Mono Pivot Bearing Blood Pump Design, Simulation and Prototype



1.8: Mock loop and hemolysis setup at AIG Hospital Hyderabad and Hemolysis experiment on prototypes with human blood.

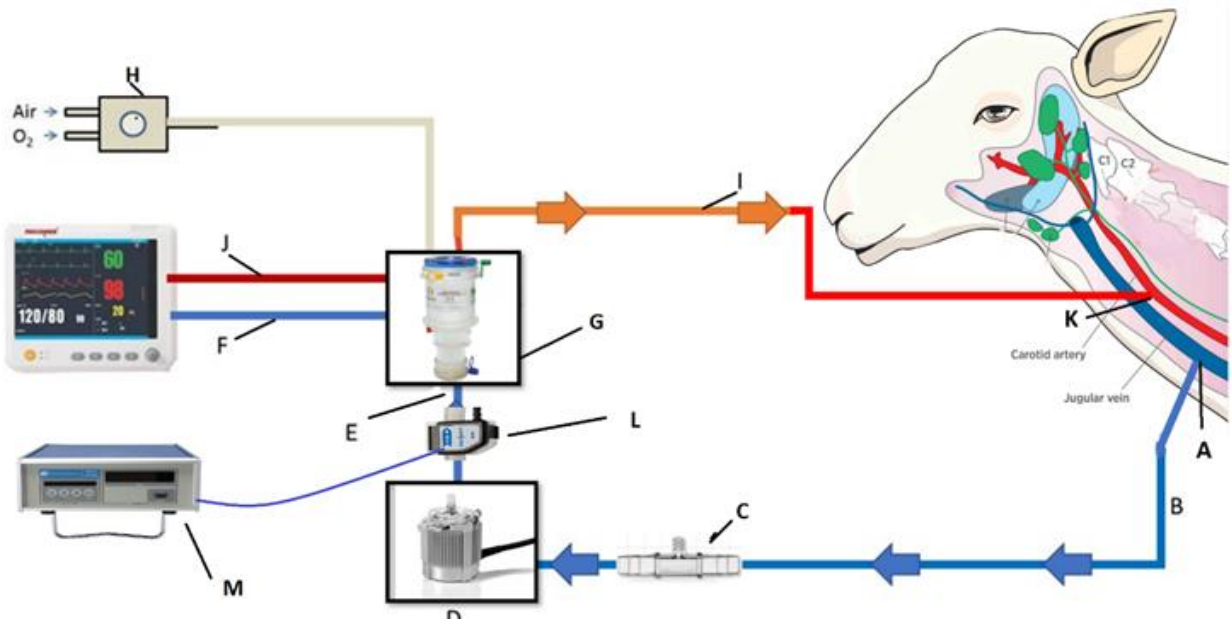


Fig.1.9: In Vivo experiment on sheep, conducted 4 cardiac Support experiments and Cardio pulomonary support on sheep at Palamur Bio Sciences Lab. (4th study on sheep was conducted on 4th Sept, 2021, 5th study in March 2022, 6th Study in July 2023 and 7th study on 20 Dec.2024

Fig.1.20: Surface roughness less than 3 micros achieved in 3D printed Prototype – with ABS material and post processing techniques.

5. PROBLEMS ENCOUNTERED AND RESOURCES REQUIRED

The gluing is currently semi-automated. For mass production, a fully automated system needs to be developed. A robotic arm for the pick and place of the pump casing on the fixture would be essential. Flood-curing UV equipment for the adhesive that would cure multiple parts in a short time would be needed for the mass production stage. Further biocompatibility tests such as von Willebrand factor and ring thrombosis need to be incorporated. Development of adequate protocols and research for these tests are ongoing. Certain chemicals and reagents need to be procured for these tests. A more sophisticated manufacturing facility for the pump parts is needed for better precision, accuracy and medical grade standards. Motor development for the pump is currently ongoing with a facility named Laxven Systems. Appropriate sensors for magnets need to be selected for their production.

Several challenges arose during the project:

a. **Lack of Established Protocols:**
   India lacks specific guidelines for LVAD development. Collaboration with DST scientists is critical to establish protocols alongside product development.
b. **Technical Issues:**

   Early animal trials faced hemolysis, resolved by the third iteration through design improvements.

c. **Funding Constraints:**

   CBIT allocated ₹50 lakhs, with consortium institutions contributing ₹2 crores in instrumentation. However, additional funding is needed for project completion for animal trials and Human trials.

d. To address this, manpower contributions from consortium institutions and shared

Our Team of Engineering and Medical Experts

Engineering Experts	Medical Experts
1. Prof. P. Ravinder Reddy Dept. of mech. Engg. and Director and Head, R&E,CBIT 2. Rugveda Thanneru, Ph.D Scholar, UPMC Piitsburg,USA 3. Sadia alva Dept. of Mech. Engg. SNIST 4. Dr Ganesh Kumar Gampa and Dr G saikumar, KITS Warangal 5. Dr James Antaki Cornell University,USa 6. Dr Boroviz Prof. Of Bio engg..UPMC, USA	1. Dr PS Reddy Professor of Medicine University of Pittsburg, USA and Chairman SHARE/Medicity institute of Medical Science, India 2. Dr D.C Sharma Head technical operations, Medical research Institute for Devices (MRIDA), Palamur Biosciences Pvt. Ltd 3. Dr Sukesh Kumar Reddy CT Surgeon, AIG Hospital 4. Dr Naresh CT Surgeon, AIG Hospital 5. Dr Ramakrishna Reddy Cardiac Anesthesiologist, AIG Hospital

2. Best Practice-II

1. Title of the practice: Open Source projects and Hackathons through COSC Club

2. Objectives of the Practice:

CBIT Open Source Community (COSC) club was established with an objective of providing a platform for creative activities. The objectives of the COSC club :

To promote free and open knowledge-base in society.
To encourage open-source software usage by creating awareness among the students and community about open sources philosophy.
· To contribute and collaborate for the development of FOSS (Free and Open Source Software) and Technologies that help people and the community at large.
· To conduct technical events, seminars, bootcamps, workshops and webinars.
· To organize internship programs during summer and winter vacations.

3. The Context:

COSC is an open source focussed Tech Community based club of Chaitanya Bharathi Institute of Technology, Hyderabad. It was formed in 2017 by a group of open-source enthusiasts who use and promote open-source software. In the present context, open-source technologies and knowledge systems are playing a major role in Engineering and Technology, with millions of developers, students, academicians, and professionals contributing to them. In this context, CBIT started COSC was started to encourage the students to participate in its activities where they can become FOSS users/debuggers/contributors/ resource persons/ Project maintainers, The members of this community conduct technical sessions, workshops, seminars, boot camps, and hackathons on different open-source software and technologies and teach the students about the open-source software and encourage them to use it. One of the major events is Hacktoberfest which is conducted every year in the month of October, by inviting the people from industry, organizations, and communities as resource participants/ persons/ judges for the events.

4. The Practice:

CBIT Open-Source Community (COSC) club is one of the most vibrant and successful clubs through which we secured prizes in various events including the Smart India Hackathon (SIH), an event of AICTE. Since its inception, COSC-CBIT could bag first prizes in all editions. The students of this community conduct technical sessions on different open-source software and technologies and teach the students about the open-source software and encourage them to use it.

The basic principle of COSC: The volunteers of COSC pledge to work as a contributor and/or maintainers in the interest of fostering an open and welcoming environment, participate in projects and community with a harass-free experience for everyone regardless of age, color, disability, gender, gender identity and expression, level of experience, education, socio-economic status, region, personal appearance, race, religion, or sexual identity, and orientation.

The Project maintainers are responsible for clarifying the standards of acceptable behavior and are expected to take appropriate and fair corrective action in response to any instances of unacceptable behavior. Project maintainers have the right and responsibility to remove, edit, or reject comments, commits, code, wiki edits, issues, and other contributions that are not aligned to this Code of Conduct, or to ban temporarily or permanently any contributor for other behaviors that they deem inappropriate, threatening, offensive or harmful

Scope: This Code of Conduct applies within all project spaces, and it also applies when an individual is representing the project or its community in public spaces. Examples of representing a project or community include using an official project e-mail address, posting via an official social media account, or acting as an appointed representative at an online or offline event. Representation of a project may be further defined and clarified by project maintainers.

Enforcement: Instances of abusive, harassing, or otherwise unacceptable behavior may be reported by contacting the project team. All complaints will be reviewed and investigated and will result in a response that is deemed necessary and appropriate to the circumstances. The project team is obligated to maintain confidentiality with regard to the reporter of an incident. Further details of specific enforcement policies may be posted separately. Project maintainers who do not follow or enforce the Code of Conduct in good faith may face temporary or permanent repercussions as determined by other members of the project's leadership.

5. Evidence of Success:

Since its inception, COSC conducted several events including the development of its own website and the members participated and won the prizes in several Hackathons. Every year events like **WebVR, *Python 101, Flask and ML, Django Campv2.0, Hands-on workshop on Deep Learning, Introduction to Git and Front-End Technologies, CBIT Hacktoberfest Hackathon*** are conducted to impart training to the students **on latest technology and skills** by the industry experts which enable them **to do better projects** and to **win the prizes** in the competitions.

Some of the achievements are:

CBIT Hacktoberfest Hackathon 2023 (7-8 OCT 2023): The CBIT Hacktoberfest Hackathon 2023, organized by COSC, had a total of 118 project submissions. The hackathon continued to promote a collaborative, problem-solving approach to real-world issues while emphasizing the importance of open source

COSC **Git and GitHub Workshop:** Participants developed practical skills in using Git and GitHub, including creating repositories, committing changes, branching, merging, and resolving conflicts.

COSC : OpenSys: The OpenSys 2024 event provided participants with a comprehensive platform to test andenhance their skills in Open-Source technologies Two students of 1st year Mechanical - 1 *Dupati Vamsi and Punnam Kota* won 1st prize of cash 1500 and two students of CET Sai Sathvik

Reddy Bontu and Peddi won 2nd prize of 1000, 2 students of ECE-3 Mohammad Abdul Muqeet and Mohammed Aumer Ali Khan won 3rd prize of Rs 500

Kushi Ideabot –Ideathon organized by Osmania University -TBI : Mr. Chegu Gnana Manikanta Arun Siva Teja (160121737104):of IT Dept, CBIT, had participated and was among the top 10 winners and got ₹1 Lakh Incubation Support on **Jul 1, 2023,**

Tenet-Codecon 2023 Hackathon organized on 14-7-2023 by Neural Nexus CBIT(A) : one student secured 3rd Prize

K.Sai Seshadri Reddy and N.Vasanth students of IT won 1st prize and 10,000 cash in a National event organized by ICFAI, Hyderabad

"**Udvikash 2023" Hackathon**, **RVR & JC College of Engineering held on Dec 2nd 2023**

Mr. Chegu Gnana Manikanta Arun Siva Teja (160121737104) from IT, Department. CBIT -3rd year has won **2nd Prize (₹25,000 Cash prize)**

N. Vasanth & Sai Seshadri Reddy (ECE): 1st Prize (₹10,000 Cash prize) at ICFAI Hyderabad Technical Contest. (Dec 20, 2023)

The 2nd year BTech. Chemical Engineering student Ms. Vaishnavi L, , have participated and won FIRST PRIZE in Idea exploration event 3.0 which was conducted online by Entrepreneurship Promotion and Incubation Council Technology Business Incubator, Ambala on 26th Apirl 2024. The team has received a cash prize of Rs. 5000/-.

Students of ECE clinched first position at the recent Technical Project Expo competition 'Inventex' held at Osmania University. Their project was recognized for its innovative approach to long-range Satellite Communication technology (FHSS modulation technique and redundancy planning in space subsystems, among other things (22-03-24)

" Fempreneur -2024" organized by Cowe.Telangana held on 27th March 2023 , ECE student team Won 2nd Prize for pitching our idea of "Compact paddy dryers".

Idea Presentation, Osmania University : The team Polyphoenix received **first prize by CBIT Chemical Engineering students** at the Idea Presentation event at TechnOsmania-2024, hosted by the Department of Chemical Engineering, University College of Technology, Osmania University on 19th March 2024

Mr. Udesh Salvar, 2024 (BTech. Chemical Engineering) batch has received a Community Innovator Fellowship (CIF) grant of 2 lakhs, a program initiated by Atal Innovation Mission, NITI Aayog through ACIC-CBIT. The tenure of CIF is for 1 year, ie. 2024-25. May 2024

Business Plan Competition at BV Raju Institute of Technology) The 2nd year students of BTech Chemical Engineering Ms. Sathwika Bathini and Mr. Abhilash, along with the mentor

team Dr. P.V.Naga Prapurna and Dr. Prasanna Rani R, won **First prize** at the Business Plan Competition hosted by BV Raju Institute of Technology (19-30 April 2024)

Rahul Tej Mora (160120735156 of ECE): Winner of Mathedemia24 with ₹25,000 Cash prize. (May 17, 2024) : organised by Mathedemia24, MATH with a Prize level: first, Amount :of Rs. 25000/-

6. Problems Encountered and Resources Required:

- Funding is required to organize competitions and to give away the prizes. To some extent, the institute is sponsoring but requires more funds to encourage more events and to give more prizes.
- The second is the space for the conduct of events, discussion, meetings etc. It requires more seminar halls and computer labs. Sometimes it is difficult to adjust the almanac, however we are trying to develop separate space for these activities without disturbing the class work.
- Academic Calendar is tightly scheduled either with the regular classwork or examinations. Hence, to include the activities of COSC as part of academics like internships, activity points, etc. is under consideration.
- Finding faculty advisors during Smart India Hackathon competitions that were conducted outside the state has become a tough task. Faculty advisors with real-time project exposure are to be nominated as advisors for SIH and other competitions.

Best practice- 3

Title of the Practice: Internship/ Upskilling of the students in their winter break

1. Objectives Of The Practice

The institute has initiated a best practice of implementing a mandatory four week winter upskilling program for all the 2nd and 3rd year BE/BTech. UG students from 2023-24 onwards for upgradation of skills for their career progression.

The key objectives of the internship and upskilling include

Upskilling is the process of acquiring new skills or enhancing existing ones to meet the demands of the job market, stay competitive, and adapt to evolving industries. It is an essential strategy for both students and professionals to ensure continued relevance in the workforce.

a. **Enhancing Employability**: Internship and Upskilling programs help students acquire in-demand skills that make them more competitive in the job market
b. **Keeping Pace with Industry Trends**: Many industries evolve quickly, and upskilling programs can help students stay up-to-date with the latest trends, tools, and technologies
c. **Building Practical Knowledge**: It often provides hands-on experience and real application which helps student build the gap between academic learning and industry expectations.

d. **Boosting Confidence:** Gaining new knowledge can improve a student's confidence in both academic and work place.
e. **Portfolio development :**A combination of upskilling courses and internship experience allows students to build a portfolio showcasing both theoretical knowledge and practical experience, increasing their attractiveness to potential employers

To conclude with the rise of automation and AI, students can prepare for the changing future of work by developing skills that complement emerging technologies.

2. THE CONTEXT :

The context of offering upskilling courses and internship in industries refers to the rationale, environment, and circumstances under which these courses are provided to individuals, particularly students.

Traditional education often focuses on foundational knowledge, while upskilling courses provide practical, real-world skills and knowledge. To supplement formal education by offering more industry-specific training, bridging the gap between theoretical education and practical job market demands

The fast pace of technological change is reshaping industries, requiring individuals to continuously update their skills to remain relevant in the workforce. Hence the students need to equip with the latest tools, platforms, and software that are shaping industries such as AI, data science, cybersecurity, digital marketing, and automation.

The job market increasingly demands specific skill sets, often blending technical and soft skills, such as problem-solving, communication, and adaptability. Upskilling courses provide students with targeted learning experiences that prepare them for the specific skills that employers are actively seeking.

With longer life expectancies and shifting career paths, professionals are expected to continually upgrade their skills throughout their careers. To promote a culture of continuous learning, where students embrace the idea that learning doesn't stop at graduation but is an ongoing process.

As companies expand globally, students must understand cross-cultural communication, global markets, and international business practices. To prepare students for international careers, or roles that require global business awareness and collaboration with international teams.

The Practice:

The institute helps in providing a range of upskilling opportunities such as online courses, certifications, webinars, or workshops that target both hard and soft skills. Collaborate with professionals or companies to offer workshops or training to ensure students gain real-world knowledge. During internships, students are assigned with mentors who guide them through tasks and provide constructive feedback to enhance their learning. Regular feedback from both students and employers is taken to evaluate internship programs and make necessary adjustments.

Every student has to undergo a minimum of Three Internship programs during their study of B.E/B.Tech Degree program under R-20, R-22 and Two internship programs for R22A. The internship programs may include the activities of Industrial Training/Govt./NGO/MSME/Rural Internship/Innovation/Entrepreneurship/National Skills Qualification Framework (NSQF) level 3 to 5 and Intra/Inter institutional training or workshop. The credits earned shall be considered for the award of degree. To each one (1) credit, student has to put up 40 to 45 hours of work i.e., full-time intern is expected to spend 45 hours per week on Internship, Training, Project work, Seminar activates etc. Internship may be full-time or part-time

In Upskilling program which is offered during student's winter vacation, need to spend total of 60 hours in a selected company or multiple companies. For R22 the winter vacation upskilling certification courses shall be awarded with 0.5 credit in II year and additional 0.5 credit in III year winter vacation i.e. it carries a total of 1 credit which is considered for CGPA. The students after completion of the course need to submit their completed certificate to claim for their credits before commencement of class test -1 of the upcoming semester to their respective SPOCs (Table 1)

5. Evidence of Success:

The faculty were designated as Co-coordinators and SPOCs to identify and approach certain companies for training and certification in upskilling program.

A total of 2926 engineering students of IV and VI semester of all programs offered have completed the winter upskilling program from various companies mentioned below. Besides around 1473 Third year engineering students studying R20 regulation have also completed internships in various companies related to their area of study in 2023-24.

Table 1. List of department wise faculty designated as SPOCs for respective companies.

S.No	Name of the Faculty	Department	Certification programme
1	Sri A Mohan	CSE	All Infosys Certifications
2	Ms KH Vijaya Kumari	IT	Associate Cloud Engineer
3	Dr Narayana Garlapati	AIML	CISCO
4	Dr T Aravind Babu	ECE	MATLAB Mathworks
5	Dr Narayana Garlapati	AIML	AI Foundations and AI advanced
6	Dr A Sirisha	IT	MongoDB
7	Dr T Prathima	CDC	Competitive Coding training by GeeksforGeeks

8	Ms Shoba Rani	AIDS	AMCAT
9	Mr. Cholleti Harish	EEE	TCS NQT IT Readiness
10	Dr R Ravinder Reddy	CSE	Amazon Sponsored Certifications
11	Dr E Padmalatha	CSE	Microsoft Certifications
12	Dr B Veera Jyothi	IT	Redhat Certifications
13	Dr Venugopala Rao	IT	Oracle Certifications
14	Dr G Jaya Rao	CSE(IOTCSBC)	EC Certifications & Comptia Certifications
15	Dr K Radhika	AIDS	Google Certifications
16	Ms I Srujana	CSE	PEGA,
18	Sri Md Ziauddin Jahangir	ECE	Salesforce
19	Sri U Sairam	IT	RPA
20	Sri Chandrakanth	Mech	Core Mechanical
21	Sri Kalyan	Civil	Core Civil
22	Sri Srisailam	EEE	Core EEE
23	Dr Nagadevi	ECE	Core ECE
24	Sri I Balakrishna	Chem	Core Chemical
25	Dr S Sumitra	Biotech	Core Biotech

Other Best Practices of the Institute :

Objectives of the Practice:

The main objective is to enhance the performance of the all the departments in terms of imparting education to the student community and also for good Research.

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1. Three course audits in every semester to inspect the on-going academic activity
2. To enhance the Quality of the Program and to ensure Continuous Improvement PAQIC, DAB, BoS, DRC and CEGs are available.
3. Balanced composition of representatives from Industry, R&D Organisations, Premier academic institutions and alumni are maintained in all departmental committees (PAQIC, DAB, BoS and DRC).
4. Effective academic practices with CBCS and OBE implementation
5. Curriculum is being revised every 2 years to meet current trends.
6. In-house financial support for carrying out innovative students' projects.
7. Students are doing projects in industry supported labs (eg. NCRC).
8. Students are encouraged to do Mini projects, open-ended and structured enquiry based experiments in each lab.
9. Every Department has experienced and dedicated faculty in all important respective domains
10. Well trained and skilled technical staff to cope up with the latest experiments

11. Maintaining the good Retention Ratio of the faculty
12. Students are encouraged to do SWAYAM NPTEL/MOOCs to enrich their knowledge base.
13. Every year a good number of project proposals are submitted to funding agencies.
14. Students are trained on Entrepreneur skills through T-Tribe of T-Hub.
15. Dedicated hours in the time table for counseling and mentoring (Discovery wheel concept) and for FIT India.
16. Organizing Guest Lectures by alumni and Industry experts in every semester regularly.
17. Active professional clubs such as IEEE SB, IETE Student Forum, IEEE SPS SBC, IEEE CSS, MoI and Robotics.
18. Awarding best teacher and student awards.
19. Yearly the technical fest (SUDHEE) and a cultural and sports fest (SHRUTHI) are organized for inculcating the competitive spirit among the students.
20. Organising R & D day to inculcate the research culture.
21. Instituted a research medal/awards to toppers in the branch to recognise and honor the best student performer in research.
22. Encourages the students with financial support to take part in technical events, seminars & conferences.
23. Campus Recruitment Training for pre-final year students to improve placements further.
24. Mandatory Internships. Skill development programs and Industrial visits for better industrial exposure.
25. Mandatory activity points for all round development of learners.
26. Dedicated project labs for students to carry out their projects.
27. Encouraging students to participate actively in Co-Curricular and Extra-Curricular activities through CBIT clubs.
28. Stakeholder surveys are considered for curriculum improvement.
29. Good number of MoUs with reputed organizations.
30. LabVIEW Academy School to train the students in LabVIEW.
31. Systematic procedure for allotment and monitoring student projects. Plagiarism checks to improve the quality.
32. Yearly releasing news bulletin.
33. ICT tools are used for interactive teaching.
34. Well-structured Course material is maintained and is made available to students through LMS.
35. Assignments are designed to address higher BT level.
36. Remedial classes are conducted for slow learners and for fast learners GATE classes are being conducted.
37. A three day Semester Readiness Program (SRP), a pre-semester curriculum summit where faculty collaboratively cogitate, plan, design, develops a learner centric teaching environment

38. The work load to PI/Co-PI is relaxed for the smooth conduct of their research projects.
39. A total of 9 harvesting pits each of size 1.2 x 1.2 m near almost each building are under operation in the campus and are well maintained for rainwater to percolate