**1 Title of the Practice:Projects based impactful learning with the academic learning**

**2. Objectives of the Practice:** In conjunction with industry, government and other universities, continue to provide acute experiential learning for students.

**3. The Context:** Projects are leveraged for impactful learning about the academic and industry topics (e.g. Cloud, Big Data, Ai/ML), and how projects are executed (methodology) by industry. As a result, students are delighting professionals at the partnering industry organizations, particularly in new technologies. As a result, students are delighting professionals at the partnering industry organisations, particularly in new technologies they themselves behind and learn from students.

**4. The Practice:**Techno India NJR has created a repository of high level and real-life projects for students involving technologies like AI, ML, Data Analytics, Watson, Blockchain, Cloud, Mobile Computing and AR/VR. In addition, good problem statements submitted by various Ministries of Government of India for Smart India Hackathon in last 3 years have been converted into student projects with latest technology stack. As students have been trained in design thinking, they are encouraged to convert real life problems, they see in society/city into a problem statement and then into a project. Awarded student projects like Lake Monitoring System, Smart Meter Grid project, and Farmers Friend and IC Fabrication lab in VR have emerged through this process only.Techno India NJR has established its own large Public Cloud infrastructure (**100 Virtual Machine, 400 Cores, 256 GB RAM, 100 TB Storage**) on the campus with Big Data handling capabilities (Hadoop, HIVE, Spark etc installed) to train students on handling and management of cloud. This provides unique hands on learning for students.Techno India NJR has developed a sharp expertise in planning and managing hackathons. Many local level hackathons have been arranged, its teams returned with medals in external hacks and AICTE awarded management responsibility as a center for SIH-2018, SIH-2019 and SIH-2020. Also, we have collaborate with EON Reality, the global leader in Augmented and Virtual Reality based knowledge and skills transfer for industry and education, to provide AR and VR training and certification program for higher education colleges in the northwest region of the country. Through this program, students will learn the skills needed to develop their own AR, VR & XR projects and prototypes for different industry verticals using EON-XR.

**5. Evidence of Success:**Cultivating the Entrepreneurial culture and providing support to start-ups, indeed, forms the rock-solid foundation for a progressive economy. 1/3 time on academic studies and 2/3 on industry-linked learning" philosophy of Techno India NJR has transformed education and outcomes for students and faculty. To enhance incubation, Techno India NJR have applied Projects transforming learning, many projects, in conjunction with industry, governments and other universities, continue to provide acute experiential learning for students, some example include:

- Lake Monitoring System (IOT + Cloud + Data Analytics+ publication)
- Data Cops (Cloud, Data Analytics, AI, Blockchain): winning national competition sponsored by IT Minister 2nd prize beating an IIT team at 3rd. The first prize by VIT
- Wricks (Smart bricks using plastic waste and marble slur, patent filed, multiple awards won and collaboration with industry being pursued for production)
- Manufacturing Data Analytics (IOT, AI/ML, video-analytics) in conjunction with ClearPack (a Singaporean company in food containers manufacturing)
- AR/VR Simulation of IC Chip design/Production in conjunction with CSIRO Lab and Manipal University
- A new version of voting solution based on Blockchain, to be moved from Ethereum to IBM Blockchain technology, as its founders move base from Australia to UK (at project definition stage)

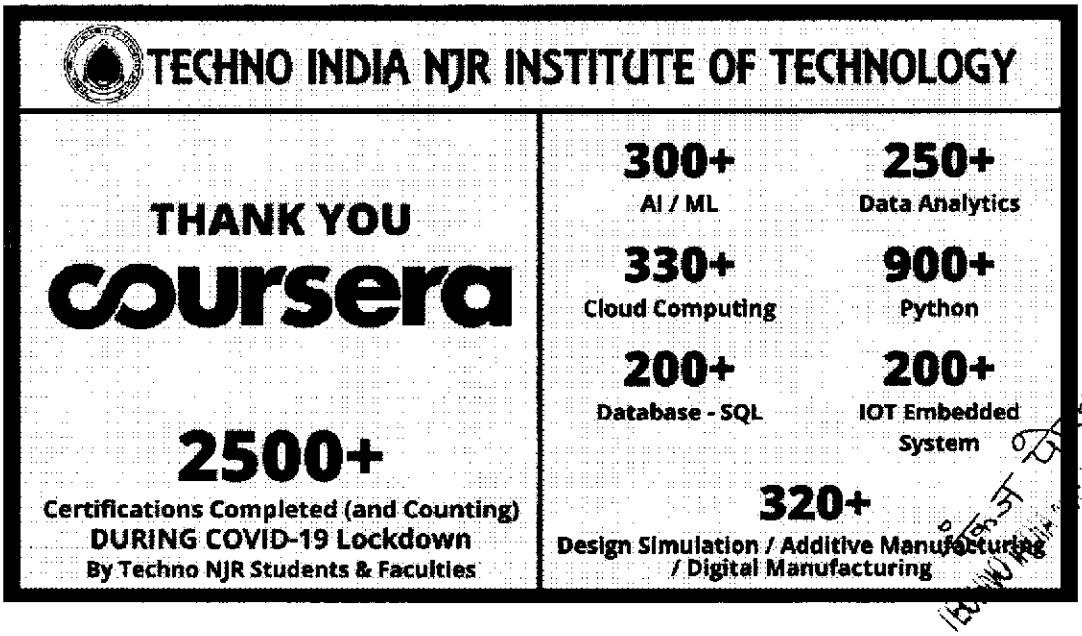
- Business Intelligence, integration code and reports development for a Healthcare consulting company (at project definition stage)
- Covid-19 Citizen Isolation Management in conjunction with Rajasthan Government (Sensors, Cloud, Data Analytics, AI/ML)
- Low-cost Ventilators R&D in conjunction with ClearPack. A mechanical and electronic controlled prototypes are built in just seven days (project underway: mechanical, IOT, Cloud, Data Analytics, AI/ML – a true Industry 4.0 project with Digital Transformation theme)

The latest example of project-based learning with academia industry with Techno NJR Cloud and its large capacity for Big Data and end-to-end project exposure where Techno India NJR developed management suit with Rajasthan Government for COVID-19 isolation patient. Few outcomes are listed below int the table:

**Hackathon/Awards/Conferences**

| | | | |
|---|---|---|---|
| 1 | Entrepreneurship Bootcamp – Schulich School of Business | 1st Runner Up | 12,500 CAD |
| 2 | Intel Hack 2017 | Student Innovation | 6000 USD |
| 3 | Rajasthan DigiFest 4.0 - 2018 | Winner | 15 Lakh INR |
| 4 | Rajasthan DigiFest 3.0 - 2017 | 1st Runner Up | 10 Lakh INR |
| 5 | Smart India Hackathon - H/W | 1st Runner Up | 75000 INR |
| 6 | Smart India Hackathon - S/W | 2nd Runner Up | 50000 INR |
| 7 | TechGig Code Gladitors 2018 - | 1st Runner Up | 1 Lakh INR |
| 8 | TechGig Code Gladitors 2017 - | 1st Runner Up | 75000 INR |
| 9 | Tech Challenge 2017 - | Winner & Runner Up | 1 Lac INR |
| 10 | HackGSF 2017 - FinTech | Winner | 20000 INR |

**6. Problems Encountered and Resource Required:**To keep aligned faculties to deliver the new technologies to the students is the major challenge. For that we keep inspiring faculties members to enroll in MOOC and update their knowledge. Most delightful outcome of our 5 years of journey with new ways of learning has been 2500+ online certification done by faculty and students during COVID-19 lockdown period including many 1st year students.



**7. Notes:**Based on team's experience over a period of 5 years and hundreds of faculty certifications earned by team members, it started unique program of creating content on new technologies for easy understanding of subject by students. They have combined their unique ability of understanding the technology as well as student's learning process. Most industry experts who create content or teach students understand the technology well but miss pedagogy required to teach and train Indian students. (A typical Indian student is not highly comfortable learning purely online/LMS/mentoring alone. They need some hand holding) and in the process students loose interest.

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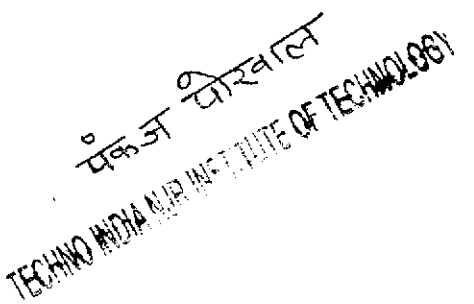

**1 Title of the Practice: Research based innovative learning**

**2. Objectives of the Practice:** To enable the students to develop innovative ideas and inculcate the same in the related research aspects.

**3. The Context:**Technologies and science are changing day by day. In order to develop any novel idea there is a need of upgradation of the knowledge and contest literature review of research articles as on date.

**4. The Practice:**. The institute has a strong research team .The faculties of the institute have more than 30 books in their credit and there are several active international research MOUs One of the faculties has been awarded as Distinguished Research Fellow at Dana Brain Health Institute Iran for two years and research collaborative work includes AI in medical informatics with foreign research collaborator Dr M Nami. Recenty few notable publications in high impact factor SCIE journals include "Online Rotor And Stator Resistance Estimation Based On Artificial Neural Network Applied In Sensorless Induction Motor Drive", Energies ( http://doi.org/10.3390/en13184946 ) [SCIE / Scopus Q2 - IF : 2.702 ] , "Development of Energy Efficient Drive for Ventilation System using Recurrent Neural Network" , Neural Computing and Applications ( https://doi.org/10.1007/s00521-020-05615-x ) [ SCIE / Scopus Q1 - IF 4.774 ], "Analysis of earthquake prediction in India using supervised machine learning classifiers", Sustainibility 2021 ( https://doi.org/10.3390/su13020971 )[ SCIE / Scopus Q2 – IF 2.576 ] , "Prediction of Chronic Kidney Disease - A Machine Learning perspective", IEEE Access ( http://doi.org/10.1109/ACCESS.2021.3053763 ) [ SCIE / Scopus Q1 – IF 3.745 ] , "Deep Learning methods for classification of certain abnormalities in Echocardiography", Electronics , 2021 ( https://doi.org/10.3390/electronics10040495 )[ SCIE / Scopus Q2 – IF 2.421 ]. The Australian Innovation Patents filed from the institute include "An efficient power distribution based IoT-Fog resource for effective proxy negotiation for traffic reduction" Patent file number 2020104365 ; "Improved IoT-based control system combined with an advanced control management server-based system" Patent file number 2020104364 ; "Technique to GIS modelling of water bodies by mapping riparian vegetation along the shore" Patent file number 2021100002 ; "A method to measure the air pollution impact on terrestrial and natural vegetation in urban locations" Patent file number 2021100000 ; "A process of degrading polystyrene plastic using beetle larvae" Patent file number 2021100302 ; "Future Summer Temperature average prediction from air temperature rater data" Patent file number 2020104352 ; "A deep transportation model to predict the human mobility for autonomous vehicle" Patent file number 2021100003 , "A dynamic legged locomotion process using the spring-loaded inverted pendulum (SLIP) for soft robot" Patent file number 2021100083 , "A closed loop serpentine crawling technique for two anchor peristaltic mobile soft robot" Patent file number 2021100301 ; "A scientific model for predicting change in rainfall using climatic raster data mining" Patent file number 2021100001 ; "IoT-Enable wireless sensor networks for controlled and safe routing" Patent file number 2021100084 ; "Secure technique in energy harvesting IoT devices using slotted ALOHA with NOMA" Patent file number 2021100913 ; "GPS data spoofing and malfunctioning detection system using classifiers" Patent file number 2021100964 ; "Phenyl ethanoid glycoside from the bark of oroxylum indicum vent: a potential inhibitor of DNA topoisomerase IB of leishmania donovani" Patent file number 2021100265.

**5. Evidence of Success:**The institute has a strong research team in the areas of applied artificial intelligence and data analytics. The faculty members are engaged in doctoral and post-doctoral supervision. The faculties and students have more than 50 Scopus indexed publications in their credit in 2019-20 (CAY). The faculties are Fellow of

prestigious societies and Visiting Research Professor of reputed institutes in India and abroad. Many national and international patents have been filed in several areas of research.

**6. Problems encountered and Resources Required:** To keep aligned faculties to deliver the new technologies to the students is the major challenge. For that we keep inspiring faculties members to enroll in MOOC and update their knowledge. Most delightful outcome of our 5 years of journey with new ways of learning has been 2500+ online certification done by faculty and students during COVID-19 lockdown period as well as several SCOPUS indexed publications.