



<https://naarm.org.in>

**National Agricultural Higher Education Project**  
(Funded by World Bank)

**Call for Innovative Research Project Proposals**

**Part – I**

**General Information**

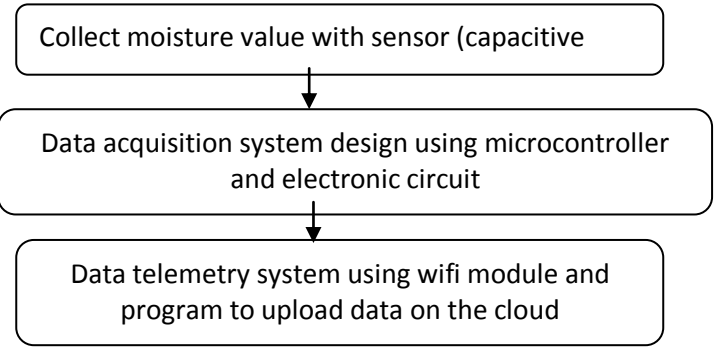
Name and Address of the University submitting the project proposal	<b>ABES Engineering college,</b> campus-1, 19 <sup>th</sup> km stone, NH24, Ghaziabad-201009 (U.P), India
Name and Designation of Executive Authority of the university forwarding the application	<b>Dr. Shailesh Tiwari</b> , Professor & Director, ABES Engineering college, Ghaziabad.
Project Title	Sensor based smart micro irrigation system using IoT
Specific Category(Please Tick)	<input type="checkbox"/> Supply Chain Management <input type="checkbox"/> <b><u>Soil, Water &amp; Energy Conservation</u></b> <input type="checkbox"/> Agricultural Education Management <input type="checkbox"/> Prediction and Intelligence Services <input type="checkbox"/> Post-harvest Management Crop and Animal Health Management
Details of Principal Investigator( <i>from university</i> )	Ashish Gupta
Name	

Designation	<b>Assistant Professor</b>
Address	Kalpana chawla block-1 <sup>st</sup> floor, ABES Engineering college, Ghaziabad
Mobile	<b>9958454956</b>
Email	<b>ashish.gupta@abes.ac.in</b>
Name and Designation of Co-Principal Investigator/s from University <i>(not more than two)</i>	<b>1. Krishna Vir Singh</b> <b>2. Harivans Pratap Singh</b>
Name and Designation of Co-Principal Investigator from Partnering firm <i>(not more than two)</i>	<b>1. Mr. Sajeew Kutty</b>
Expenditure as per Activity Table	INR 1196200.00
Amount provisioned for University (Maximum of 35% of the total cost)	<b>INR 420000.00(max. *4.20Lacs)</b>
Amount provisioned for partnering firm <i>(Maximum of 65% of the total cost)</i>	<b>INR 776200.00(max.**7.80 Lacs)</b>
Date of Start of the Project	01 April 2020
Date of Completion of the Project	31 March 2021

## Part – II

### Technical Information

<p><b>Problem Statement</b> <i>(About 300 words)</i></p>	<p>Projections made by the International Water Management Institute (IWMI) indicates that one-third of the world population would face absolute water shortage by the year 2025. Also as per the report of NITI Aayog’s published in year 2018 on ‘composite water management index’ also emphasized the miserable state of water stress. Although India has the largest irrigated area in the world, about 85 percent of total irrigation potential (139.90 million hectares) has already been created, leaving limited potential for future use. An estimate of the Ministry of Water Resources in 2008 shows the total demand for water will exceed supply by 2050. With this alarming scenario, how are we going to solve the ever increasing water shortage problem?</p> <p>We are focussing on the problem of watering plants at household plants, kitchen gardens, offices, greenhouse fields and vertical farms, society parks and stadiums where soil moisture value is not known and plants are watered on a timely basis twice or thrice a week or so. The amount of water needed by plants is not known and most of the time, water is over flooded in the area.</p> <p>We have understood that gardeners are currently restricted in their ability to match the timing and frequency of watering applications to temporal variations in soil moisture and plant growth. They generally have only limited information on plant moisture requirements &amp; rely on limited or no knowledge of measuring soil moisture; and use watering systems that lack the flexibility and control for variable water application.</p>
<p><b>Proposed Digital Solution</b> <i>(Methodologies, Approach, Prototypes, Project development and relevance in socio economic context in not more than 500 words)</i></p>	<p>We are proposing to develop a real time soil moisture monitoring system and precision irrigation technology to reduce water consumption. We will be developing a system which measures the soil moisture and provides inputs to the central system through wireless telemetry. Application equipment provides a timely opportunity to develop a closed-loop system incorporating cloud in order to</p>

	<p>maintain data values for further analysis, capable of maintaining moisture variably across plantations through micro irrigation systems.</p> <p>The combination of using irrigation trigger points at defined physiological set points combined with a precision application system will enable significant water savings. We aim to minimize the water consumption to its optimized threshold value used to irrigate greenhouse farms and vertical farms.</p>
<p><b>Objectives</b> (Not more than 3)</p>	<ol style="list-style-type: none"> <li>1. Design &amp; development of sensing node</li> <li>2. API development for uploading data on cloud.</li> <li>3. Closed loop control for irrigation</li> </ol>
<p><b>Hypotheses</b></p>	<p>In general the gardeners/ caretakers of the plantations have a tendency to irrigate the plants on a fixed frequency after a estimated duration, without using any data feedback or considering the soil conditions, this will result in huge amount of water wastage, as most of the times when moisture is present in the plantation, they supply water that will spillover from the plant roots and get wasted. Providing a sensor based real time input about the soil moisture levels will save a considerable amount of water from getting wasted. It will save energy &amp; time also.</p>
<p><b>Work plan</b> (Experimental methods, statistical approaches, models, products development responsibilities of university and responsibilities of partnering firm etc. in not more than 500 words)</p>	<div style="text-align: center;">  <pre> graph TD     A[Collect moisture value with sensor (capacitive)] --&gt; B[Data acquisition system design using microcontroller and electronic circuit]     B --&gt; C[Data telemetry system using wifi module and program to upload data on the cloud] </pre> </div> <p><b>Work plan:</b></p> <ol style="list-style-type: none"> <li>1.Design &amp; testing of circuit for the sensing of moisture and this analog value will be converted into digital by microcontroller.</li> <li>2.The controller will send the data on the cloud with the help of wifi module.</li> <li>3. The complete system is powered using a battery supported with a charging circuit.</li> <li>4.The node designed will be installed on the field for test, calibration &amp; validation.</li> <li>5. Data will be collected and validated against the standard methods of moisture measurement.</li> </ol>

	<p>6. Data is processed for further analysis.</p> <p>7. The design will be optimised on the basis of stakeholders feedback.</p> <p>8. Data related to test, calibration &amp; validation will be recorded in the project report.</p> <p>Institute will also showcase the developed product to promote and propagate, within its extant rules / provisions and provide the required resources as part of joint product development viz., implementation, training and support; hosting mechanism, where applicable; source code license management system, etc. Partnering firm will constitute a project team to develop the product and develop the assigned product adhering to the product delivery plan as agreed from time to time. It will appoint one person as representative and will provide all support for the product developed like bug-fixing, customization, enhancement and roll-out. Institute will provide access to its infrastructure to the private partnering firm, who in turn shall comply with all extant/ evolving security and safety procedures of the institution</p>
--	---

**Activity-Expenditure Table:**

<b>S. No</b>	<b>Activity</b>	<b>Budget Required for University (U)</b>	<b>Budget Required for Partnering Firm (P)</b>
1.	Manpower		421200.00
2.	Hardware		275000.00
3.	Travel	90000.00	80000.00
4.	Intellectual property right/research paper	105000.00	
5.	Brain storming	45000.00	
6.	Institute expense	180000.00	

		<b>Total (U)*</b> :420000.00	<b>Total(P) ** :</b> 776200.00
<b>Total Cost of the project (Total(U)+Total(P):</b>		1196200.00	

**#Note:**

*As per the activity table in Part-II, the amount will be released by the University to partnering firm which will ensure that amount is spent as per approval and by duly following the audit & accounting procedures / requirement of the University. The partnering firm will provide all receipts, vouchers etc., to the university. The approved activities will be carried out by the partnering firm accordingly without any further day to day approvals.*

## Part-III

### Milestones and Deliverables

**Output-Indicators (Not more than three in each phase)**

Phase I:

#### First Six Months

Outputs	Monitoring Indicators
1. Team selection	Team members name finalized
2. Component purchase	Purchase procedure completed with store
3. Proof of concept	A device to be implemented in field

Phase II:

#### Next Three Months

Outputs	Monitoring Indicators
1) Field test data and calibration	Data on cloud and analysis, calibrated sensor
2) Upgrade system with relevant findings	Change in design if any
3) Field test , validation	Data value validated with standard procedures.

Phase III:

#### Last Three Months

Outputs	Monitoring Indicators
1. Calibration adjustment for different field conditions	Multiple Field data acquisition
2. Concluding Product Design	Field test results consolidated
3. Reports	

#### Major outcomes from the project

1. A wireless sensing node for soil moisture data acquisition.
2. API for Data upload on cloud.

3. Validated test results.
4. Reports of the project work containing test and calibration data.
5. High Quality research papers and patents.

**What are you giving to the society? And how does it impact the lives of the farmers? (*Not more than 200 words*)**

Our solution will help to save water and reduce the human efforts of irrigating the plants. The invention is low cost and can optimise the water use by irrigating the plant whenever the soil moisture is below a threshold level.

In the greenhouse the CO<sub>2</sub> content is high which is unhealthy for humans. Our device can reduce this impact as it will sense & automatically provide the moisture as per the need of the plant, hence reduce the level of human intervention in the greenhouse

**Expected Intellectual Property (IP) product expected to be developed**

1. Design of sensing node
2. Design of system and algorithm implemented for data uploading on cloud and analysis

The university will protect the Intellectual Property Rights and will be owner of the IP. The Inventor will assign the rights of IP to the university. The benefits of Commercialization of such IP will be realised by university and partnering firm on mutual agreed terms.



## Part-IV Profile of the PI

### A. Profile with following details *(max one page as enclosure)*

1. Name and Designation, Address: Ashish Gupta,  
Assistant Professor, 1<sup>st</sup> floor  
campus-1, KC block  
ABES engineering college,  
Ghaziabad(U.P)

### 2. Educational Qualifications:

<b>Degree/ Examination</b>	<b>Year of Passing</b>	<b>School/Institute</b>	<b>Board/ University</b>	<b>Percentage /Grade</b>
Ph.D	persuing	NERIST, Arunachal Pradesh, India	NERIST	8.7
M.S (Instrumentation & control Engineering)	2013	NIT Tiruchirapalli(T.N)	NIT, Tiruchirapalli	7.8
B.Tech (Electronics & instrumentation)	2008	Meerut Institute of Engineering and Technology, Meerut(U.P)	UPTU	65.3
Class XII	2003	Dewan Public School, Meerut(U.P)	C.B.S.E	72.8
Class X	2001	Christu Jyoti Convent School, Baghpat(U.P)	I.C.S.E	74.3

### 3. Best Five Research papers as first author

- “Effect of modeling hemodynamic response function on statistical value in SPM for EEG correlated fMRI data of epileptic patient”. International conference on Biomedical Engineering and Assistive Technologies 2012, at NIT Jalandhar
- “statistical parametric mapping of EEG correlated fMRI data to detect Epileptic foci”. International conference on Biomedical system, signal and images 2012, at IIT-Madras

- “Investigations on EEG signals using Spectral analysis”. National conference at ISM, Dhanbad, India.
- “Controlling of Temperature and Humidity for An Infant Incubator Using Microcontroller” PUBLISHED IN International Journal of Advanced Research in Electrical, Electronics and Instrumentation Engineering (An ISO 3297: 2007 Certified Organization) Vol. 4, Issue 6, June 2015. ISSN (Print) : 2320 – 3765, ISSN (Online): 2278 – 8875.
- An IOT Enabled Air Quality Measurement. Indian Journal of Science and Technology, DOI: 10.17485/ijst/2018/v11i46/139720, December 2018.

4. Top Five Products Developed

- IOT enabled pollution monitoring device

5. Five Externally Funded Research Projects Handled

6. Best Five Books as first author

7. How are you competent to handle the project (*not more than 200 words*)?

- Heading IoT-COE at abes engineering college with a team of 3 faculties and 10 students
- Pursuing PhD with research area: Design & performance analysis of WSN node for IoT applications
- Trainer of embedded systems since 7 years: Atmega16, 8051, Atmega2560, arduino, raspberry Pi, Labview CLAD certified, Labview Core-1, core-2 and core-3 trainer.
- Guest lecture delivered at Jaypee University, Noida and IGDTU, Delhi
- Cisco certified trainer for Internet of things and connected things
- Certification from NPTEL for introduction to internet of things
- Co-Convener of SAE Student convention-2017
- Co-ordinator of lecture series on role of engineering aspirants in CORE industry
- M.Tech thesis guided-2 , with NITTR Chandigarh and AKGEC Ghaziabad
- Project guide for various B.Tech final year projects
- Worked on research project on biomedical signal processing with SCTIMST, Trivandrum
- Mentor for ESV challenge by SAE- India

## Profile of the CO-PI

1. Name and Designation, Address : **Krishna Vir Singh**, 1st Floor, KC Block, ABES Engineering College, Campus 1, 19km Stone, NH-24, Ghaziabad, Pin: 201009(U.P.), India.

2. Educational Qualifications:

<b>Degree/ Examination</b>	<b>Year of Passing</b>	<b>School/Institute</b>	<b>Board/ University</b>	<b>Percentage /Grade</b>
Ph.D	pursuing	University Campus, Dehradun	UTU, Dehradun	--
M.Tech (Computer Science & Engineering)	2015	BTKEC, Dwarahat, Almora(Uttarakhand)	UTU, Dehradun	8.5
B.Tech (Computer Science & Engineering)	2008	F.E.T, R.B.S. College, Agra(U.P)	UPTU	62.14
Class XII	2003	Lucknow Public Inter College, Lucknow(U.P)	U.P.Board, Allahabad	63.4
Class X	2001	Lucknow Public Inter College, Lucknow(U.P)	U.P.Board, Allahabad	63.6

3. Best Five Research papers as first author

“ Generation of Test Oracle Using Meta Heuristic Search Technique” Published in International Journal of Latest Trends in Engineering & Technology, Page No. 325-334, ISSN: 2278-621X, Volume 5 Issue 4, July 2015.

4. Top Five Products Developed

- a. Agriculture Information System Developed for IBM INVITE07.
- b. IoT based local weather monitoring system.

5. Five Externally Funded Research Projects Handled : N/A

6. Best Five Books as first author : N/A

7. How are you competent to handle the project (*not more than 200 words*)?

- Worked in IBM organized state level E-Governance Project Development Contest ‘INVITE07’ and awarded as best project. The Project theme is ‘Agriculture Information System’. This project is also appreciated at national Level Contest IBM TGMC-08.
- Developed IoT based local weather monitoring System.
- CISCO Certified Instructor for IoT Fundamentals: Connecting Things.
- CISCO Certified Instructor for IoT Fundamentals: Big Data Analytics.
- CISCO Certified Instructor for IoT Security.
- CISCO Certified Instructor for CCNA (Cyber Ops).
- CISCO Certified Instructor for CCNA (Routing & Switching).
- Head Center of Excellence : Cyber Security & Networking at ABES Engineering College, Ghaziabad.
- Head Center of Excellence : Cloud Computing at ABES Engineering College, Ghaziabad.
- Guided Multiple Undergraduate projects.

Name and Designation, Address : **Harivans Pratap Singh**, 1st Floor, KC Block, ABES Engineering College, Campus 1, 19th Km Stone, NH-24, Ghaziabad, Pin : 201009 (U.P.), India.

### 1. Educational Qualifications

<b>Degree/Examination</b>	<b>Year of Passing</b>	<b>School/Institute</b>	<b>Board/University</b>	<b>Percentage/Grade</b>
Ph.D (Computer Science & Engineering)	Pursuing (Thesis submission in process)	UTU,Dehradun, India	UTU,Dehradun, India	7.5
M.Tech (Computer Science & Engineering)	2013	UTU,Dehradun, India	UTU,Dehradun, India	8.9 CGPA
B.Tech (Computer Science & Engineering)	2008	F.E.T.R.B.S. College Agra (U.P)	UPTU	64.3 %

Class XII	2002	Government Inter College,Pratapgarh (U.P)	U.P.Board Allahabad	65.4 %
Class X	2000	Government Inter College,Pratapgarh (U.P)	U.P.Board Allahabad	66.6 %

## 2. Best Five Research papers as first author

1. Singh, Harivans Pratap; Dimri, Priti; Tiwari, Shailesh; Saraswat, Manish ” Segmentation Techniques through Machine Based Learning for Latent Fingerprint Indexing and Identification” JSIR Vol.79(03) [March 2020], 201-208.
2. Singh, H.P., Dimri, P., Tiwari, S. “An approach to latent fingerprint indexing preprocessing techniques and its functionality” International Journal of Innovative Technology and Exploring Engineering ,2019,208-213,S.No. 37,Volume 8 Issue 8,ISSN: 2278 - 3075.
3. Singh, H.P., Dhimri, P., Tiwari, S. “Latent fingerprint indexing and segmentation techniques ” International Journal of Innovative Technology and Exploring Engineering ,April 2019,145, Volume-8 Issue-6, ,ISSN : 2278 - 3075.
4. Singh,H.P.“Segmentation of Latent Fingerprint using Neural Network “International Journal of Engineering and Advanced Technology (IJEAT), October 2019, ISSN: 2249 – 8958, Volume-9 Issue-1.
- 5 Singh, H.P., Dimri, P. “A survey of latent fingerprint indexing and segmentation based matching” book chapter in Lecture Notes in Networks and Systems springer 2020.

## 3. Top Five Products Developed:

- Smart irrigation system based on weather forecasting via IOT.
- WAVE-1 and WAVE-2, Contenteal Project Technologies used: QT,QML, C++,Shell script.

This is used in the Car Dashboard system for Infotainment which includes multimedia, email, sms, contact book, usb and ipod connectivity features along with Vehicle features like Parking Assistance, Blind Spot Detection and Climate Control. The Messaging module is responsible for downloading, displaying and sending messages from a connected BT device supporting the MAP profile. ATB (Autonomous Telematics Box Manager) – Development BL, AL, and HMI logics and write these unit test cases for each modules. Development of Three types of Popup's (Question Popup, Alert Popup, List Popup) all are get from the BL and Display on HMI side. All development in C++ on Qt Creator And HMI on QML for inter process communication using the D-BUS.

- CALLEE AVAILABILITY STATUS APPLICATION: Show the availability of Callee before making the call. The aim is to make a system which detects the presence of the intended person near the phone when he is being called by the caller. This system is going to be very helpful in the corporate offices because every employee
- SPEECH Recognition Component of a Car Navigation System (PT Compiler, QT CreaTOR).: Transcription service is a multithreaded application and one of the components of car navigation system which takes input text data like song name, artist name, album name for connected media device and contact name, phone name for connected phone device from the database created at runtime and generates the speech recognizable data in different languages for the speech recognition purpose.

#### 4. Five Externally Funded Research Projects Handled:

- I am working on one consultancy project funded by TopRankaers Bangalore India .

#### 5. Best Five Books as first author: N/A

#### 6. How are you competent to handle the project (*not more than 200 words*)?

- I am Head Center of Excellence : RPA(Robotics Process Automation) at ABES Engineering College, Ghaziabad
- Head Center of Excellence : Software Testing (Manual & Automation ) at ABES

Engineering College, Ghaziabad

- Having good knowledge of project development life cycle and having 6 yrs of work experience in the IT industry
- Pursuing PhD with related area image processing using machine learning and Artificial Intelligence.
- Having good knowledge of project development life cycle and having 6 yrs of work experience in the IT industry
- Diploma Certified on RPA on UiPath Studio.
- Guided Multiple Undergraduate projects.
- Working as an Assistant Professor in Computer Science and Engineering Department of ABES Engineering College Ghaziabad India .
- In our research work includes Latent fingerprint indexing their segmentation and identification efficiency.
- Other area of interest are Software Engineering, Software Testing (Manual & Automation),
- RPA (Robotics Process Automation) on UiPath Studio.
- UML on UML Design Patterns, .

### **Profile of Co-PI from the partnering firm:**

- 1. Name and Designation, Address:** Mr. Sajeev Kutty, Chief Executive Officer, Konsultera Services Pvt. Ltd, 701, Anant Exquisite, Piramal Nagar, Goregaon West, Mumbai, Maharashtra, India, ZIP Code: 400062
- 2. Educational Qualifications:** B.Sc Statistics
- 3. Best Five Research papers as first author:** N/A
- 4. Top Five Products Developed:** N/A
- 5. Five Externally Funded Research Projects Handled:** N/A
- 6. Best Five Books as first author:** N/A
- 7. How are you competent to handle the project (*not more than 200 words*)?**

Konsultera aims to be a global smart solutions technology company that offers a comprehensive range of services dedicated to meeting the workflow, operational excellence, efficiency and high quality requirements of services and product organizations worldwide.



Konsultera is led by a team of professionals that has immense experience across sectors, in the areas of software-enabled automation, Smart Technology implementation, Big Data & Analytics, KPO, Operations, Work-flow and Processes, IT Security, ISO Certifications, among others.

Konsultera's team of among the brightest minds have served leading Fortune-listed organizations and other global majors, including Banks and other Financial Services, Big-4 Consulting, IT Majors, KPOs, Information Services, among others.

### **Konsultera Leadership**

Technology strategists with substantial and robust experience in designing, building, and evolving world class enterprise solutions, innovative product development and development of infrastructure solutions.

From defining product roadmaps, architecture, technology and Cloud infrastructure to leading and program-managing several initiatives aimed at driving change, service excellence, advanced analytics, operational efficiency and risk reduction across industries and geographies (APAC, Europe, US), Konsultera's leaders bring extensive skills to guide a smart, able and progressive team.

## **Profile Organisation- ABES Engineering college, Ghaziabad**

ABES is ISO 9001:2015 certified by TUV RHIENLAND. NAAC Accredited. NBA Accredited Departments of CSE, ECE, IT, ME. ABES was Established in the year 2001 with a vision. ECE and CSE department got re-accredited by NBA till June 2022.

In year 2019 Value-added courses imparting transferable and life skills have trained more than 300 students. ABES bagged 35 Lakhs of Fund from DST under DST-NIMAT Project 2018-19. In year 2018 total number of student enrolled for B.Tech were 3949 and in post graduation course were 397. ABES is currently having 7 incubation companies working in different domains. more than 120 research papers have been published in UGC approved journals.

Center for Applied Research and Entrepreneurship (CARE) has been playing a pivotal role to bridge the gap between classroom teachings (which is mostly theory oriented) and their applications. In the past few years student teams have been trained and sent to various national and international competitions. This pursuit has yielded good results like securing 11 global rank in UAV Challenge – Medical Express and successive good results in Electric Solar Vehicle Challenge and Efficycle. One of the major pursuits of the center is to engage industry in the capacity of solution consultants. In this capacity the center has designed and delivered industry grade projects for the likes of Intex Ltd and LGF Sysmac, position detector machine, RO Health monitoring system, BAJA SAE, Fault diagnosis and assessment of casting defects in copper alloy fancy single taps (faucets) & mixers, improve the air delivery performance of a domestic electric fan by Havells, Mechanical Assistant Arm for Wheel Positioning by Honda, Designing of a Wireless communication of audio signals between the source and the master and slave units of tower speakers by Intex and various such projects have been executed by ABES.

Nature of the Project	Duration	Name of the funding agency	Total grant sanctioned
Major Projects	2	Vishversariya Research Proposal Scheme, AKTU, Lucknow	500000
Major Projects	1	AKTU Lucknow	300000
Major Projects	1	AKTU Lucknow	300000
Major Projects	1	AKTU Lucknow	300000
Major Projects	1	AKTU Lucknow	300000
Minor Projects	1	UBAIIT DELHI	100000
Minor Projects	2	UPCST	20000
Minor Projects	1	DTU Delhi, GLBITM Gr. Noida, IGDTU Delhi	330000
Industry sponsored Projects	06	Vimal Organics Ltd	300000
Industry sponsored Projects	1	Shah Multilayer Pvt. Ltd	110000

<https://www.abes.ac.in/innovations/>

<https://www.abes.ac.in/about-us/naac/>

<https://www.abes.ac.in/academics/departments/under-graduate/electronics-and-communication-engineering/research-and-development/consultancy-projects-ece/>

## B. Expertise available with the University in the present research area with web link (*max one page as enclosure*)

### *Speaker 2.0 Project by Intex*

- *Intex Technologies is one of the leading manufacturers of consumer electronics. One of their product ranges is a wired audio system wherein 2 or more satellite speakers are connected to the main speaker. Based upon the number of satellite speakers the system is called 2.1 or 5.1 audio system. All the connections between the satellite and the master system are through wires.*
- *The client wanted to develop a cheap wireless alternative to the present wired connectivity. The first stage of this multistage project was to design and fabricate a system capable of wireless transmitting audio between a master tower and a*

*satellite tower. The expected deliverable was a proof of concept demonstrating the in-principle feasibility of such a system. By the beginning of the first week of June 2017, the first stage was successfully delivered to the client.*

***Door handles redesign by LGF Sysmac***

*LGF Sysmac offers a wide range of products for the Construction and the Building Industry. One of their products is a stylish door handle. The client wanted this door handle to be redesigned with some modifications. This short-term project was successfully delivered by the first week of September 2017.*

<https://www.abes.ac.in/innovations/applied-research/consultancy-projects/>  
<https://www.abes.ac.in/academics/departments/under-graduate/computer-science-engineering/research-and-development/patents/>  
<https://www.abes.ac.in/academics/departments/under-graduate/computer-science-engineering/research-and-development/projects/>  
<https://www.abes.ac.in/academics/departments/under-graduate/electronics-and-communication-engineering/research-and-development/consultancy-projects-ece/>

**C. Expertise available with the partnering firm in the present research area with web link (*max one page as enclosure*)**

Konsultera aims to be a global smart solutions technology company that offers a comprehensive range of services dedicated to meeting the workflow, operational excellence, efficiency and high-quality requirements of services and product organizations worldwide.

Konsultera's leaders bring extensive skills to guide a smart, able and progressive team. Konsultera is led by a team of experienced professionals with deep insights and hands-on experience across sectors, in the areas of software-enabled automation, Smart Technology implementation, Big Data & Analytics, KPO, Operations, Workflow and Processes, IT Security, ISO Certifications, among others.

From defining product roadmaps, architecture, technology and Cloud infrastructure to leading and program-managing several initiatives aimed at driving change, service excellence, advanced analytics, operational efficiency and risk reduction across industries and geographies (APAC, Europe, US), the team is equipped to deliver enterprise-class solutions that address the specific needs of organizations in the competitive business environment.

Konsultera's team comprises the brightest minds that have served to lead Fortune-listed organizations and other global majors, including top banks and other financial services organizations, Big-4 Consulting firms, IT Majors, KPOs, information services enablers, among others.

<https://www.konsultera.in/>


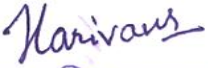

**D. University bank details for online transfer of money**

1. Name of A/c holder (as per Bank record ): DIRECTOR ABES ENGINEERING COLLEGE
2. Bank Account No. 0674002190423103
3. Bank Branch Name & Address Punjab National bank , Navyug Market, Ghaziabad, U.P.
4. MICR Code: 110024202
5. IFSC Code: PUNB0067400

## Declaration

We agree to responsibilities and general terms and conditions given in call for development of innovative digital solution. The progress report and final report will be submitted as per time lines. Research project will be carried out with all the scientific ethics, values and regulations etc. In case of any conflicts/ grievances between the partners, the decision of NAHEP will be the final and binding on the both parties.

### Name & Signatures of Co-PIs

S. No	Name of the Co-PI	Signature
1.	Krishna Vir Singh	
2.	Harivans Pratap Singh	
3.	Sajeer Kutty	
4.		

### Principal Investigator

Name: Ashish Gupta

Signature: 

Date: 19/03/2020

Place: Ghaziabad



Signature of Executive Authority  
of University with seal & date  
Director  
ABES Engineering College  
Ghaziabad