



FORMAT FOR INSTITUTE FUNDED SEED GRANT PROPOSAL

Name of the Principal Investigator: Mr. N S M Ravi Kumar

Designation: Assistant Professor

Department: Civil Engineering

Title of the Project: Study on Manufacturing of Bricks by Using Mineral Admixtures in Alternate Solution" sanctioned

1. Background

1.1 Description of the problem

The bricks with clay, lime, silica fume, and polyvinyl alcohol with a purpose to supply a higher expertise at the residences of bricks like compressive strength, water absorption and size and shape of brick was good while comparing the other kind of bricks. The scope of this project is to determine and compare the strength of the bricks by using different percentage of polyvinyl alcohol, lime and silica fume. By using lime, silica fume and PVA the project aims to create bricks that have longer life span and improved performance.

1.2 Rational for taking up the project:

The use of these materials in brick manufacturing has the potential to improve the environmental performance of the industry by reducing the need for natural resources and Energy intensive processes. Additionally, the resulting bricks may exhibit improved thermal insulation, fire resistance, and other properties that are important for construction applications. As such, the incorporation of silica fume, lime powder, and polyvinyl alcohol powder into the brick mix represents a promising approach to sustainable and efficient brick manufacturing.

1.3 Description of Proposal

1.3.1 Objectives of the Project

To improve the fire resistance of bricks by adding silica fume and lime powder which have high melting points and can withstand high temperatures.



Devineni Venkata Ramana & Dr.Hima Sekhar MIC College of Technology

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NAAC With Grade A

To produce bricks with a smoother surface and fewer cracks by using polyvinyl alcohol powder to improve the flow and consistency of the brick mix.

To reduce the cost of brick production by using silica fume and lime powder which are less expensive than some traditional brick making materials.

1.4 Innovative component of the project

Environmental challenges facing the world, including the development of bio-derived, biodegradable and recyclable polymers – also known as bioplastics.

The report points to particular technological advances in optimizing bioplastic production and improving its properties to provide the performance and longevity expected by consumers. Meanwhile, chemical recycling technologies are offering potential options to reduce waste plastic going to landfill.

Finding an inexpensive alternative to existing plastics with similar performance which impacts the environment less is a challenge. Before the world shifts to using biodegradable or at least bio-derived plastics, the functionality of these materials will likely need to approach that of existing plastics by using potato starch-based biodegradable plastics.

1.5 Methodology detailing stepwise activities and sub-activities

This study will investigate to optimal proportions of lime silica fume and PVA to use in manufacturing process in order to achieve the desired strength and durability. The bricks will be tested for compressive strength, water absorption and durability. The study will also investigate the environment impact of this method and compare it with the traditional method of manufacturing. The results of the study will provide valuable information for the brick manufacturing industry and could lead to the development of more durable and sustainable bricks.

2. Work Plan

Phase-wise plan of action up to post-project activities detailing time schedule.

Time	1-3 Months	4-6 Months	7-9 Months	10-12 Months
Activity	Literature survey	Problem identification & Framing research design	Project Implementation & Finding	Preparing project reports & Paper Communication

3. Expected Outcome and Deliverables of the Project



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With Grade **A**

In this project work, The objective is to check the suitability of PVA powder, lime powder and silica fume in clay bricks. By using different proportions of above materials.

We will test bricks under compressive strength machine the obtained results were compared with standard values.

The bricks manufactured using PVA, lime, silica fume shall have a result better than the minimum value as 9.8 N/mm, 8.9N/mm² and 7.4N/mm respectively.

By using 1% PVA, 5% lime, 3% silica are the proportions of each material in their respective bricks. Their results shall be better with this proportion.

Likely Impact(Please attempt to quantify) : Yes

4. Suggested Post-Project Activities:

The production of biodegradable plastic using potato as well as vegetable waste.

5. Budget estimate

A. Recurring (in Rs):15000

1.Lime. 2. Water. 3. Silica Fume 4. Poly vinyl Alcohol.

B. Non-Recurring (Equipment/Instrument)(in Rs): 30000

C. Total (in Rs): 45,000

Date: 22.07.2020

Place: Kanchikacherla


Signature of the Principal Investigator



Research and Development Cell

10.07.2019

To

Mr. N.S.M. Ravikumar,
Associate Professor,
Department of Civil Engineering,
Devineni Venkata Ramana & Dr. Hima Sekhar MIC College of Technology,
Kanchikacherla.

Sub: Letter of sanction

Dear N.S.M. Ravikumar,

The Management of Devineni Venkata Ramana & Dr. Hima Sekhar MIC College of Technology appreciate your efforts in submitting your proposal titled: "Study on Manufacturing of Bricks by using Mineral Admixture in Alternate solution" seeking a seed grant. After thorough scrutiny, the Research Advisory Committee of the Institution has selected and recommended your proposal for the sanction of Rs 45,000/- to work for a period of one Year.

This seed money grant is provided to enable you to undertake preliminary research work which can result either in a 'proof of concept' or 'proof of experience'. Further, you are expected to apply to external funding agencies (both public and private) to take the outcomes of this project to its intended goal.

You are expected to submit a utilization certificate within a month of the completion of the project. The work done under this project shall be used only for the benefit of the institution and it will not be used or transmitted to anywhere else. The conditions for the conduct of this work will be as per the Seed Grant Policy of the institution.

Wishing you good luck.

Principal

PRINCIPAL

Devineni Venkata Ramana & Dr. Hima Sekhar
MIC College of Technology
Kanchikacherla, Krishna District

Copy to:

- HOD, Department of Civil Engineering, MIC
- Account Section, MIC



Devineni Venkata Ramana & Dr.Hima Sekhar
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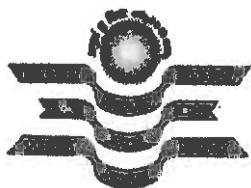
PROJECT COMPLETION REPORT FOR INSTITUTE FUNDED SEED GRANT

- 1) **Title of the project:** "Study on Manufacturing of Bricks by Using Mineral Admixtures in Alternate Solution"
- 2) **Name of the Principal Investigator(s) and Co-Investigator(s):** Mr. N S M. Ravi kumar
- 3) **Date of commencement:** 10-07-2019
- 4) **Proposed date of completion:** 31.06.2020
- 5) **Actual date of completion:** 20.8.2020
- 6) **Objectives as stated in the project proposal:**

In this work The bricks with clay, lime, silica fume, and polyvinyl alcohol with a purpose to supply a higher expertise at the residences of bricks like compressive strength, water absorption and size and shape of brick was good while comparing the other kind of bricks. The scope of this project is to determine and compare the strength of the bricks by using different percentage of polyvinyl alcohol, lime and silica fume. By using lime, silica fume and PVA the project aims to create

- 1) bricks that have longer life span and improved performance

Experimental set up	Brick Moulds Mineral Admixtures CTM
Methodology	This study will investigate to optimal proportions of lime silica fume and PVA to use in manufacturing process in order to achieve the desired strength and durability. The bricks will be tested for compressive strength, water absorption and durability. The study will also investigate the environment impact of this method and compare it with the traditional method of manufacturing. The results of the study will provide valuable information for the brick manufacturing industry and could lead to the development of more durable and sustainable bricks.
Results	The bricks manufactured using PVA, lime, silica fume had a result better than the minimum value as 9.8N/mm^2 , 8.9N/mm^2 and 7.4N/mm^2 respectively.



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By using 1% PVA, 5% lime, 3% silica are the proportions of each material in their respective bricks. Their results are better with this proportion.

The brick which is prepared by using three materials in one brick was doesn't perform well. This brick can't withstand to a minimum strength.

By our analysis these bricks have cost less than the normal clay brick and these bricks which are prepared by using PVA, lime, silica can be used in building works which are not directly subjected to the loading

- 2) Detailed analysis of results indicating contributions made towards increasing the state of knowledge in the subject:

SOUNDNESS TEST:

Soundness check of bricks indicates the character of bricks towards unexpected impact. In this test, 2 bricks are selected randomly and struck with one another. Then sound produced need to be clean bell ringing sound and brick need to know no longer break. Then it's far stated to be correct bricks.

1 Polyvinyl Alcohol - Metallic sound is observed (2nd Class brick)

2 Lime -Metallic sound is observed (2nd class brick)

3 Silica Fume - Metallic sound is observed (2nd class brick)

4 PVA+LIME+ SILICA FUME-

Metallic sound is observed (3rd class brick)

HARDNESS TEST :

A pinnacle brick have to resist scratches in the direction of sharp things. So, for this take a look at a pointy device or fingernail is used to make scratch on brick. If there's no scratch influence on brick then it's far stated to be tough brick.

4 PVA+LIME+SILICA FUME -Medium quality of brick.

Conclusions summarizing the achievements and indication of scope for future work:

Drip irrigation automation with live monitoring has been proposed using Wi-Fi module and Cloud Computing. The System has high efficiency and accuracy in fetching the live data of fields such as soil moisture level and temperature including the ground water level. Whether it is online or offline the notification for the ground water level drop can be notified through mobile or system. This system has also improved the normal agricultural irrigation process by using drip irrigation which is used in less water wastage.



7) Budget utilization:

Sr.	Budget Head	Funds Sanctioned	Expenditure	% of Total cost
1.	Recurring (in Rs) :	15,000	Labour Cost – 8000 Food & Refreshments – 4000 Travel Expenditure – 3000	33.33
2.	Non-Recurring (Equipment/Instrument) (in Rs)	30000	Brick Moulds Mineral Admixtures CTM	66.67
3.	Others, if any	Nil	Nil	Nil

8) Plan for utilizing the equipment facilities in the future, if any – Not applicable


Signature of the Principal Investigator

Date: 20.8.2020

Place: Kanchikacherla



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UTILIZATION CERTIFICATE

Certified that out of Rs 45,000 of institute funded seed grant for the "Study on Manufacturing of Bricks by Using Mineral Admixtures in Alternate Solution" sanctioned during the Academic Year 2019-20 in favour of Mr. NSM. Ravikumar from Department of Civil Engineering dated 10.7.2019 and a sum of Rs. 45,000 (Rupees Forty-Five Thousand only) has been utilized for the purpose for which it was sanctioned. The balance amount if any is refunded to the institution.

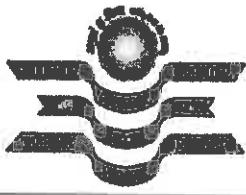
Signature of PI

Signature of Accounts Officer

Signature of Head of the Institution

Devineni Venkata Ramana & Dr. Hima Sekhar
MIC College of Technology
KANCHIKACHERLA - 521 180.

PRINCIPAL
Devineni Venkata Ramana & Dr. Hima Sekhar
MIC College of Technology
Kanchikacherla, Krishna District



FORMAT FOR INSTITUTE FUNDED SEED GRANT PROPOSAL

Name of the Principal Investigator: Mr.Ch. P.S. Sainadh

Designation: Assistant Professor

Department: Civil Engineering

Title of the Project: Planning and Designing an Environmentally Sustainable College Campus of DVR & Dr. HS MIC College of Technology

1. Background

1.1 Description of the problem

Proactive efforts for sustainability help to protect the environment and leave a more promising future for the next generations. The general awareness in sustainability issues has improved in the recent years through mass media coverage. However, this knowledge is not always translated into the actual sustainable practices. The main aim of this project is to improve environmentally sustainable practices in DVR & Dr. HS MIC College of Technology.

1.2 Rational for taking up the project:

Sustainability is the ability to exist and develop without depleting natural resources for the future. Sustainability consists of fulfilling the needs of current generations without compromising the needs of future generations, while ensuring a balance between economic growth, environmental and social wellbeing. Sustainable development goal is “conserve and sustainably use natural resources for sustainable development”. Therefore, it is important to use the environment and its resources rationally and protect it for the good of the earth, our environment, humanity, and all living things.

1.3 Description of Proposal

1.3.1 Objectives of the Project

The objective of this project to supply biodegradable plastic by using potato starch and perform grain size measurement tests and Vickers micro hardness tests and using biodegradable plastics for moulding workpiece and study the comparison with conventional petroleum-based plastics.

1.4 Innovative component of the project

The major environmentally sustainable elements like Rainwater harvesting, Roof top rain water storage, Recycling of waste water, Composting of leaves of plants, Production of Biogas by using canteen food waste. Are identified in our efforts to design sustainable college campus.



Sustainable practices in college campus educate the students and other stakeholders on the usage of resources efficiently. All the sustainable practices mentioned above are useful to protect the environment besides improving the reuse of natural resources. In this project we are planning to design a sustainable college campus by using available natural resources. The feasibility and scope for implementation of different sustainable elements are discussed here.

1.5 Methodology detailing stepwise activities and sub-activities

To make MIC college campus environmentally sustainable, we have chosen 5 sustainable elements.

The environmentally sustainable elements are as follows:

- Rainwater harvesting
 - Roof top rainwater storage
 - Recycling of wastewater
 - Composting of leaves of plants
 - Production of Biogas by using canteen food waste
- The importance and benefits of the above environmentally sustainable elements

2. Work Plan

Phase-wise plan of action up to post-project activities detailing time schedule.

Time	1-3 Months	4-6 Months	7-9 Months	10-12 Months
Activity	Literature survey	Problem identification & Framing research design	Project Implementation & Finding	Preparing project reports& Paper Communication

3. Expected Outcome and Deliverables of the Project

- I have to design the rainwater harvesting pits for playground and bus parking area. The size of the harvesting pits of playground and bus parking area are (5 x 3.5 x 4 m) and (6 x 3 x 3 m) respectively.
- I have to design the roof top rainwater storage tanks for storing the roof top rain water. The size of the storage tanks of Main block, BED block and Hostel are (24.19 x 12.09 x 4 m), (9 x 9 x 3 m) and (9 x 8 x 2 m) respectively. And I have also determined the diameter of conveyance pipe and is 150 mm.

I have also design the wastewater recycling filter for the recycling of waste water from college campus. For that we have designed the slow sand filter for main block, girls and boys hostel and BED block and the sizes are (2 x 2 x 2.2 m), (2 x 2 x 2.1 m) and (2 x 1 x 2.2 m) respectively.



- I have to make an experimental procedure for the production of biogas from canteen food waste. And need to estimate the production of biogas. Based on this estimation approximately the college can save the 5.7 cylinders per year.
- I have also make a composting of leaves of plants in a clay pot and also estimated the yield of compost from leaves is approximately 72 kg/month.
- So, these are the 5 sustainable elements that makes the DVR & Dr.HS MIC College of Technology environmentally sustainable.

4. **Likely Impact(Please attempt to quantify) : Yes**

5. **Suggested Post-Project Activities:**

So, these are the 5 sustainable elements that makes the DVR & Dr.HS MIC College of Technology environmentally sustainable.

6. **Budget estimate**

A. Recurring (in Rs):25,000

1. Leaves of Plants. 2. Canteen Food Waste. 3. Rain Water.

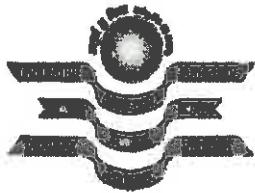
B. Non-Recurring (Equipment/Instrument)(in Rs): 15000

C. Total (in Rs):40,000

Date: 23.06.2019

Place: Kanchikacherla

Ch-PSAneesh
Signature of the Principal Investigator



Research and Development Cell

10.07.2019

To

Mr. Ch. P.S. Sainadh,
Assistant Professor,
Department of Civil Engineering
Devineni Venkata Ramana & Dr. Hima Sekhar MIC College of Technology,
Kanchikacherla.

Sub: Letter of sanction

Dear Ch. P.S. Sainadh,

The Management of Devineni Venkata Ramana & Dr. Hima Sekhar MIC College of Technology appreciate your efforts in submitting your proposal titled: "Planning and Designing an Environmentally Sustainable College Campus of DVR & Dr. HS MIC College of Technology" seeking a seed grant. After thorough scrutiny, the Research Advisory Committee of the Institution has selected and recommended your proposal for the sanction of Rs 40,000/- to work for a period of one Year.

This seed money grant is provided to enable you to undertake preliminary research work which can result either in a 'proof of concept' or 'proof of experience'. Further, you are expected to apply to external funding agencies (both public and private) to take the outcomes of this project to its intended goal.

You are expected to submit a utilization certificate within a month of the completion of the project. The work done under this project shall be used only for the benefit of the institution and it will not be used or transmitted to anywhere else. The conditions for the conduct of this work will be as per the Seed Grant Policy of the institution.

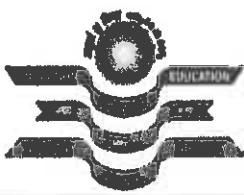
Wishing you good luck.

Principal
PRINCIPAL

Devineni Venkata Ramana & Dr Hima Sekhar
MIC College of Technology
Kanchikacherla, Krishna District

Copy to:

- HOD, Department of Civil Engineering, MIC
- Account Section, MIC

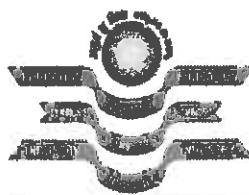


PROJECT COMPLETION REPORT FOR INSTITUTE FUNDED SEED GRANT

- 1) Title of the project: "Planning and Designing an Environmentally Sustainable College Campus of DVR & Dr. HS MIC College of Technology"
- 2) Name of the Principal Investigator(s) and Co-Investigator(s): Mr. Ch. P.S. Sainadh
- 3) Date of commencement: 10-07-2019
- 4) Proposed date of completion: 31.06.2020
- 5) Actual date of completion: 20.8.2020
- 6) Objectives as stated in the project proposal:

Proactive efforts for sustainability help to protect the environment and leave a more promising future for the next generations. The general awareness in sustainability issues has improved in the recent years through mass media coverage. However, this knowledge is not always translated into the actual sustainable practices. The main aim of this project is to improve environmentally sustainable practices in DVR & Dr. HS MIC College of Technology.

Experimental set up	Biogas setup
Methodology	To make MIC college campus environmentally sustainable, we have chosen 5 sustainable elements. The environmentally sustainable elements are as follows: <ul style="list-style-type: none">• Rainwater harvesting• Roof top rainwater storage• Recycling of wastewater• Composting of leaves of plants• Production of Biogas by using canteen food waste The importance and benefits of the above environmentally sustainable elements
Results	We have designed the rainwater harvesting pits for playground and bus parking area. The size of the harvesting pits of playground and bus parking area are (5 x 3.5 x 4 m) and (6 x 3 x 3 m) respectively.



Devineni Venkata Ramana & Dr. Hima Sekhar
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	<p>We have also designed the roof top rainwater storage tanks for storing the roof top rain water. The size of the storage tanks of Main block, BED block and Hostel are (24.19 x 12.09 x 4 m) , (9 x 9 3 m) and (9 x 8 x 2 m) respectively. And we have also determined the diameter of conveyance pipe and is 150 mm.</p> <p>We have also designed the wastewater recycling filter for the recycling of waste water from college campus. For that we have designed the slow sand filter for main block, girls and boys hostel and BED block and the sizes are (2 x 2 x 2.2 m), (2 x 2 x 2.1 m) and (2 x 1 x 2.2 m) respectively.</p>
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- 7) Detailed analysis of results indicating contributions made towards increasing the state of knowledge in the subject:

Design of Roof top rainwater storage tanks:

1. Based on the annual rainfall data:

The average rain fall of past 17 years is 1037.13 mm

Therefore, intensity of rainfall $i = 3 \text{ mm/day}$

2. As per guidelines of roof top rainwater harvesting (IS 15797:2008) runoff coefficient for flat concrete roof top $C = 0.95$

3. Formula to calculate total discharge,

$$Q = C \times i \times A$$

Where, C = runoff coefficient

i = rainfall intensity

A = area of roof top

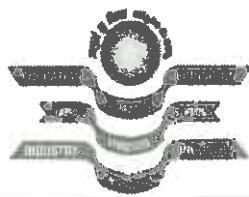
Based on this the size of the storage tanks are determined and as follows.

Table: - 5 Size of Roof top rainwater storage tanks

S. No	Building	Tank size in m (L x B x D)
1	Main block	24.19 x 12.09 x 4
2	BED block	9 x 9 x 3
3	Boys hostel	9 x 8 x 2

- 8) Budget utilization:

Sr.	Budget Head	Funds Sanctioned	Expenditure	% of Total cost
1.	Recurring (in Rs) :	20,000	1. Collection of Leaves of Plants. 2. Collection of Canteen Food Waste. 3. Collection of Rain Water. 4. Food & Refreshments	62.5



Devineni Venkata Ramana & Dr.Hima Sekhar
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5.Travel Expenditure				
2.	Non-Recurring (Equipment/Instrument) (in Rs)		Biogas setup	37.5
3.	Others, if any	Nil	Nil	Nil

9) Plan for utilizing the equipment facilities in the future, if any – Not applicable

C.V.P.Srinadh
Signature of the Principal Investigator

Date: 20.8.2020

Place: Kanchikacherla



Devineni Venkata Ramana & Dr.Hima Sekhar
MIC College of Technology

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UTILIZATION CERTIFICATE

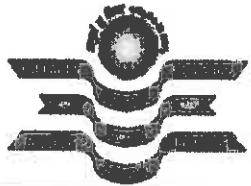
Certified that out of Rs 40,000 of institute funded seed grant for the "Planning and Designing an Environmentally Sustainable College Campus of DVR & Dr. HS MIC College of Technology" sanctioned during the Academic Year 2019-20 in favour of Mr. Ch. P.S. Sainadh from Department of Civil Engineering dated 10.7.2019 and a sum of Rs. 40,000 (Rupees Forty Thousand only) has been utilized for the purpose for which it was sanctioned. The balance amount if any is refunded to the institution.

Chesai nath
Signature of PI

H.S.
Signature of Accounts Officer
Devineni Venkata Ramana & Dr. Hima Sekhar
MIC College of Technology
KANCHIKACHERLA - 521 180.

B.Sainadh
Signature of Head of the Institution

PRINCIPAL
Devineni Venkata Ramana & Dr. Hima Sekhar
MIC College of Technology
Kanchikacherla, Krishna District



Devineni Venkata Ramana & Dr.Hima Sekhar
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FORMAT FOR INSTITUTE FUNDED SEED GRANT PROPOSAL

Name of the Principal Investigator: Mr. A V RAVI KUMAR

Designation: Assistant Professor

Name of the Co-Investigator (if any): Nil

Designation: Nil

Department: EEE

Title of the Project: Home automated system using Bluetooth and an android application

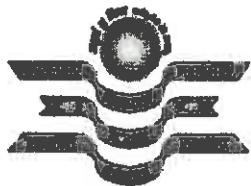
1. Background

1.1 Description of Proposal: Home automation is the use of one or more computerized remote to control basic home appliances remotely and some-times automatically. It is designed to control lighting points, entertainment systems, and home security such as access control as well as alarm systems. Automation and wireless technology have become a key technology in the twenty-first century. It helps communication between one point to another without the use of cables, and this makes the system to be more secure. The attractiveness of controlling electrical devices through a phone has been increasing because of its high performance and availability. Connecting appliances through smartphone is useful for the elderly and physically disabled persons, who can access and control the appliances from where they are located and access them remotely without the help of others. Time is a precious thing; everybody wants to save time as much as they can.

Home automation systems are a technological means of intelligent monitoring, control, feedbacks and actions of home appliances according to the needs of the home occupants. Wireless medium such as ZigBee, Bluetooth, wireless Fidelity (Wi-Fi), Short Message Service (SMS), Android Application, Wireless Sensor Network (WSN), Radio frequency identification (RFID) and Software Defined Network just mention a few serves as a medium of communication between the appliances and the control unit and according to home automation are essential for non-invasive and non-intrusive implementation of the advanced automation system.

1.2 Objectives of the project: The implementation of a Bluetooth technology and an android application with voice prompts-based home-automated system using an Arduino microcontroller.

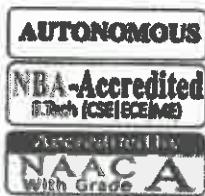
1.3 Methodology: The system is aimed at designing an automated appliance control that is user-friendly and convenient to use. The design comprised an Arduino ATMEGA328 microcontroller board, Bluetooth module (HC-06), and an android application (MIT App Inventor 2). The Arduino controls any connected



Devineni Venkata Ramana & Dr.Hima Sekhar
MIC College of Technology

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component and was programmed with C ++ programming language by using Integrated Development Environment (IDE). Relays and Triacs are used for the switching mechanism. Once the system is connected, the user controls the electrical appliances connected to the home-automated system, which can also be controlled using voice prompt with the help of a Google assistant inbuilt with the android smartphone. The system switches the home appliances ON and OFF using the android app, Bluetooth module, and voiced prompt.

2. Total (in Rs): 50000

Date: 17.06.2019

Place: Kanchikacherla


Signature of the Principal Investigator



Research and Development Cell

10.07.2019

To

Mr. A.V. Ravikumar,
Assistant Professor,
Department of Electrical and Electronics Engineering,
Devineni Venkata Ramana & Dr. Hima Sekhar MIC College of Technology,
Kanchikacherla.

Sub: Letter of sanction

Dear A.V. Ravikumar,

The Management of Devineni Venkata Ramana & Dr. Hima Sekhar MIC College of Technology appreciate your efforts in submitting your proposal titled: "Home automated system using Bluetooth and an android application" seeking a seed grant. After thorough scrutiny, the Research Advisory Committee of the Institution has selected and recommended your proposal for the sanction of Rs 50,000/- to work for a period of one Year.

This seed money grant is provided to enable you to undertake preliminary research work which can result either in a 'proof of concept' or 'proof of experience'. Further, you are expected to apply to external funding agencies (both public and private) to take the outcomes of this project to its intended goal.

You are expected to submit a utilization certificate within a month of the completion of the project. The work done under this project shall be used only for the benefit of the institution and it will not be used or transmitted to anywhere else. The conditions for the conduct of this work will be as per the Seed Grant Policy of the institution.

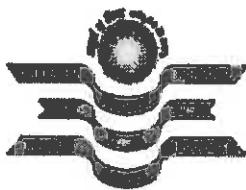
Wishing you good luck.

Principal
PRINCIPAL

Devineni Venkata Ramana & Dr Hima Sekhar
MIC College of Technology
Kanchikacherla, Krishna District

Copy to:

- HOD, Department of EEE, MIC
- Account Section, MIC



Devineni Venkata Ramana & Dr.Hima Sekhar
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e-mail: dvhrmic@mictech.ac.in, Website: www.mictech.ac.in



PROJECT COMPLETION REPORT FOR INSTITUTE FUNDED SEED GRANT

- 1) Title of the project: Home automated system using Bluetooth and an android application
- 2) Name of the Principal Investigator(s) and Co-Investigator(s): Mr. A V RAVI KUMAR
- 3) Date of commencement: 10.07.2019
- 4) Proposed date of completion: 05.06.2020
- 5) Actual date of completion: 01.05.2020
- 6) Objectives as stated in the project proposal: The implementation of a Bluetooth technology and an android application with voice prompts-based home-automated system using an Arduino microcontroller.
- 7) Deviation made from original objectives if any, while implementing the project and reasons thereof: No
- 8) Details of experimental set up, methods adopted, data collected supported by necessary table, charts, diagrams & photographs:

Experimental set up	<ol style="list-style-type: none">1. Relay Driver2. Power section3. Bluetooth4. Arduino microcontroller5. Software design and implementation6. Arduino IDE7. Proteus IDE8. Loads
Methodology	<p>The system is aimed at designing an automated appliance control that is user-friendly and convenient to use. The design comprised an Arduino ATMEGA328 micro controller board, Bluetooth module (HC-06), and an android application (MIT App Inventor 2). The Arduino controls any connected component and was programmed with C ++ programming language by using Integrated Development Environment (IDE). Relays and Triacs are used for the switching mechanism. Once the system is connected, the user controls the electrical appliances connected to the home-automated system, which can also be controlled using voice prompt with the help of a Google assistant inbuilt with the android smartphone. The system switches the home appliances ON and OFF using the android app, Bluetooth module, and voiced prompt.</p>



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Results	android application with voice command has been designed and implemented.
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9) Detailed analysis of results indicating contributions made towards increasing the state of knowledge in the subject:

The implementation of both the hardware and software programming was done initially on a Vero board. To determine whether the different components are working fine, all the components were tested using a digital multimeter to check that they conform to their datasheet. The test carried out includes a relay switching test, which is to ensure that the re-lay switches as expected and the desired signal went through the android application. Timing test was also done since the android application was developed to include a time picker which can activate or de-activate the electrical appliances connected to the system. To reduce power consumption and manage power effectively, an Observe, Learn and Adapt (OLA) algorithm through the use of machine learning tools can be adopted and the home automation system can also be switched into sleeping mode when not in use such that power consumption will be low as well as power supplied to a sensor or some sensors can be cut when it is not in use at a particular time, this can be done manually or automatically.

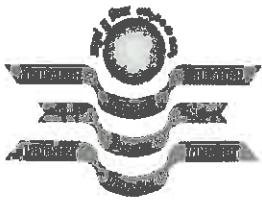
10) Conclusions summarizing the achievements and indication of scope for future work:

An Arduino based home automation system using Bluetooth and an android application with voice command has been designed and implemented. The Home automation system used an Android application and a Bluetooth technology in the design, this is because they are easy to use, fast, readily available, and reliable in communications between the remote user and devices. A low cost and highly reliable home automation system that can assist handicapped/old aged people, as well as a user-friendly device was developed.

Other features can be added in the future such as biometrics so that unauthorised persons cannot have access to the appliances and an also timing schedule can developed for each appliances connected this will effectively conserve energy.

11.Budget utilization:

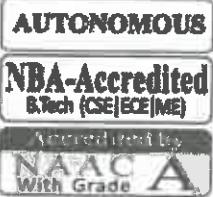
S.NO	Budget Head	Funds Sanctioned	Expenditure	% of Total cost
1	Recurring (in Rs) :	20000	Stationaries – 8000 Food & Refreshments – 2000 Connectivity - 5000 Travel Expenditure – 5000	40



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2.	Non-Recurring (Equipment/Instrument) (in Rs)	30000	1. Relay Driver 2. Power section 3. Bluetooth 4. Arduino microcontroller 5. Loads	60
3	Others,ifany	Nil	Nil	Nil

12. Plan for utilizing the equipment facilities in the future, if any – Not applicable

Signature of the Principal Investigator

Date:01.05.2020

Place:Kanchikacherla



Devineni Venkata Ramana & Dr.Hima Sekhar
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UTILIZATION CERTIFICATE

Certified that out of Rs 50,000 of institute funded seed grant for the "Home automated system using Bluetooth and an android application" sanctioned during the Academic Year 2019-20 in favour of Mr.AV Ravi Kumar from Department of Electrical and Electronics Engineering dated 10.7.2019 and a sum of Rs. 50,000 (Rupees Fifty Thousand only) has been utilized for the purpose for which it was sanctioned. The balance amount if any is refunded to the institution.

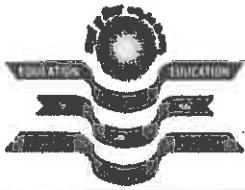
Signature of PI

Signature of Accounts Officer

Signature of Head of the Institution

PRINCIPAL

Devineni Venkata Ramana & Dr Hima Sekhar
MIC College of Technology
KANCHIKACHERLA - 521 180.



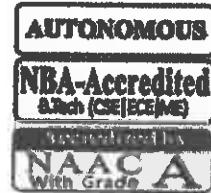
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e-mail: dvrhamic@mictech.ac.in, Website: www.mictech.ac.in



FORMAT FOR INSTITUTE FUNDED SEED GRANT PROPOSAL

Name of the Principal Investigator: Mr.M Nageswara Rao

Designation: Assistant Professor

Name of the Co-Investigator (if any): Nil

Designation: Nil

Department: EEE

Title of the Project: Power factor corrections of grid connected hybrid system

1. Background

1.1 Description of Proposal: In the present technological revolution, power is very precious and the power system is becoming more and more complex with each passing day. As such it becomes necessary to transmit each unit of power generated over increasing distances with minimum loss of power. Due to increasing use of inductive loads, the load power factor decreases considerably which increases the losses in the system and hence power system losses its efficiency.

The most common used device is capacitor bank which are switched on and off manually based on the requirement. To improve the power factor to desired level, reactive power compensators are used in the substations. The work carried out is concerned with developing power factor correction equipment based on embedded system which can automatically monitor the power factor in the electrical system and take care of the switching process to maintain a desired level of power factor which fulfils the standard norms.

1.2 Objectives of the project: To improve the power factor to desired level, reactive power compensators are used in the substations. developing power factor correction equipment based on embedded system which can automatically monitor the power factor in the electrical system and take care of the switching process to maintain a desired level of power factor

1.3 Methodology: The work carried out is concerned with developing power factor correction equipment based on embedded system which can automatically monitor the power factor in the electrical system and take care of the switching process to maintain a desired level of power factor



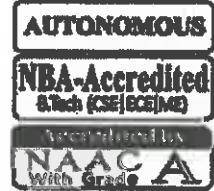
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which fulfils the standard norms. The voltage and current signal from the system is sampled and taken as input to measure the power factor and if it falls short of the specified value by utility, then the device automatically switches on the capacitor banks to compensate for the reactive power. The number of capacitors switched on or off is decided by the microcontroller based on the system power factor and the targeted power factor.

2. Total (in Rs): 60000

Date: 17.06.2019

Place: Kanchikacherla

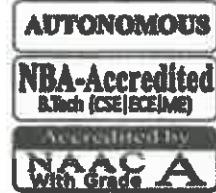
Signature of the Principal Investigator



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e-mail: dvrhsmic@mictech.ac.in, Website: www.mictech.ac.in



Research and Development Cell

10.07.2019

To

Mr. M. Nageshwar Rao,
Assistant Professor,
Department of Electrical and Electronics Engineering,
Devineni Venkata Ramana & Dr. Hima Sekhar MIC College of Technology,
Kanchikacherla.

Sub: Letter of sanction

Dear M. Nageshwar Rao,

The Management of Devineni Venkata Ramana & Dr. Hima Sekhar MIC College of Technology appreciate your efforts in submitting your proposal titled: "Power factor corrections of grid-connected hybrid system" seeking a seed grant. After thorough scrutiny, the Research Advisory Committee of the Institution has selected and recommended your proposal for the sanction of Rs 60,000/- to work for a period of one Year.

This seed money grant is provided to enable you to undertake preliminary research work which can result either in a 'proof of concept' or 'proof of experience'. Further, you are expected to apply to external funding agencies (both public and private) to take the outcomes of this project to its intended goal.

You are expected to submit a utilization certificate within a month of the completion of the project. The work done under this project shall be used only for the benefit of the institution and it will not be used or transmitted to anywhere else. The conditions for the conduct of this work will be as per the Seed Grant Policy of the institution.

Wishing you good luck.

Principal

PRINCIPAL

Devineni Venkata Ramana & Dr. Hima Sekhar
MIC College of Technology
Kanchikacherla, Krishna District

Copy to:

- HOD, Department of EEE, MIC
- Account Section, MIC



Devineni Venkata Ramana & Dr.Hima Sekhar
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With Grade

PROJECT COMPLETION REPORT FOR INSTITUTE FUNDED SEED GRANT

- 1) Title of the project: Power factor corrections of grid connected hybrid system
- 2) Name of the Principal Investigator(s) and Co-Investigator(s): Mr.M Nageswara Rao
- 3) Date of commencement: 10.07.2019
- 4) Proposed date of completion: 05.06.2020
- 5) Actual date of completion: 30.04.2020
- 6) Objectives as stated in the project proposal: To improve the power factor to desired level, reactive power compensators are used in the substations. developing power factor correction equipment based on embedded system which can automatically monitor the power factor in the electrical system and take care of the switching process to maintain a desired level of power factor.
- 7) Deviation made from original objectives if any, while implementing the project and reasons thereof: No
- 8) Details of experimental set up, methods adopted, data collected supported by necessary table, charts, diagrams & photographs:

Experimental set up	<ol style="list-style-type: none">1. Power section2. Relay Driver3. APFC Relay Panel4. Transformer5. Mother Board6. LCD Display7. Loads
Methodology	The work carried out is concerned with developing power factor correction equipment based on embedded system which can automatically monitor the power factor in the electrical system and take care of the switching process to maintain a desired level of power factor which fulfils the standard norms. The voltage and current signal from the system is sampled and taken as input to measure the power factor and if it falls short of the specified value by utility, then the device automatically switches on the capacitor banks to compensate for the reactive power. The number of capacitors switched on or off is decided by the microcontroller based on the system power factor and the targeted power factor.
Results	The voltage and current signal from the system is sampled and taken as input to measure the power factor and if it falls short of the specified value



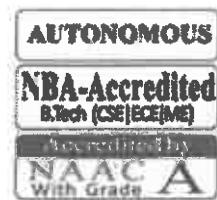
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by utility, then the device automatically switch on the capacitor banks to compensate for the reactive power. The number of capacitors switched on or off is decided by the microcontroller based on the system power factor and the targeted power factor.

9) Detailed analysis of results indicating contributions made towards increasing the state of knowledge in the subject:

The voltage and current signal from the system is sampled and taken as input to measure the power factor and if it falls short of the specified value by utility, then the device automatically switch on the capacitor banks to compensate for the reactive power. The number of capacitors switched on or off is decided by the microcontroller based on the system power factor and the targeted power factor. Prototype is verified using, an inductive load. Which initially gives a lagging power factor, which by than gives improved power factor close to unity by the proper working of the APFC unit.

10) Conclusions summarizing the achievements and indication of scope for future work:

The future scope for power factor correction in grid connected hybrid system is promising driven by advancements in renewable energy, smart grid technologies, energy storage, and digitalization. These developments will lead to more efficient and reliable power factor correction solutions, contributing to a more resilient and sustainable energy infrastructure.

11.Budget utilization:

S.NO	Budget Head	Funds Sanctioned	Expenditure	% of Total cost
1	Recurring (in Rs) :	20000	Stationaries – 8000 Food & Refreshments – 2000 Connectivity - 5000 Travel Expenditure – 5000	33.33
2.	Non-Recurring (Equipment / Instrument) (in Rs)	40000	1. Power section 2. Relay Driver 3. APFC Relay Panel 4. Transformer 5. Mother Board 6. LCD Display 7. Loads	66.67



Devineni Venkata Ramana & Dr.Hima Sekhar
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3	Others, if any	Nil	Nil	Nil
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12. Plan for utilizing the equipment facilities in the future, if any – Not applicable

Signature of the Principal Investigator

Date: 30.04.2020

Place: Kanchikacherla



Devineni Venkata Ramana & Dr.Hima Sekhar
MIC College of Technology

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Assessed by

NAAC A

UTILIZATION CERTIFICATE

Certified that out of Rs 60,000 of institute funded seed grant for the "Power factor corrections of grid connected hybrid system" sanctioned during the Academic Year 2019-20 in favour of Mr.M Nageswara Rao from Department of Electrical and Electronics Engineering dated 10.7.2019 and a sum of Rs. 60,000 (Rupees Twenty Five Thousand only) has been utilized for the purpose for which it was sanctioned. The balance amount if any is refunded to the institution.

Signature of PI

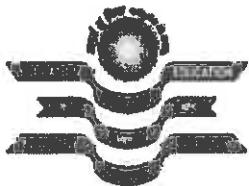
Signature of Accounts Officer

Signature of Head of the Institution

Devineni Venkata Ramana & Dr. Hima Sekhar
MIC College of Technology
KANCHIKACHERLA - 521 180.

PRINCIPAL

Devineni Venkata Ramana & Dr. Hima Sekhar
MIC College of Technology
Kanchikacherla, Krishna District



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e-mail: dvrhsmic@mictech.ac.in, Website: www.mictech.ac.in



FORMAT FOR INSTITUTE FUNDED SEED GRANT PROPOSAL

Name of the Principal Investigator: Mr.M Sunil Kumar

Designation: Assistant professor

Name of the Co-Investigator (if any): Nil

Designation: Nil

Department: EEE

Title of the Project: IoT Based Smart Agriculture Monitoring System

1. Background

1.1 Description of Proposal: One of the largest livelihood providers in India is Agriculture. Agriculture plays an essential role in supporting human life. The rise in population is proportional to the increase in agriculture production. Basically, Agriculture production depends upon the seasonal situations which do not have enough water sources. To get beneficial results in agriculture and to overcome the problems, IoT based smart agriculture system is employed.

In IoT-based smart farming, a system is built for monitoring the crop field with the help of sensors like light, humidity, temperature, soil moisture, etc. The farmers can monitor the field conditions from anywhere. IoT-based smart farming is highly efficient when compared with the conventional approach. Due to the recent advances in sensors for the irrigation systems for agriculture and the evolution of WSN and IoT technologies, these can be applied in the development of automatic irrigation systems. The system will determine the parameters that are monitored in irrigation systems regarding water quantity and quality, soil characteristics, weather conditions, and fertilizer usage and provide an overview of the most utilized nodes and wireless technologies employed to implement WSN and IoT based smart irrigation systems.

1.2 Objectives of the project: To implement the modern technology in required fields like agriculture. Using IoT technology in agriculture, this system makes agriculture monitoring easy. IoT is to monitor the agriculture by using the wireless sensor networks and collect the data from different sensors which are deployed at various nodes and send by wireless protocol.



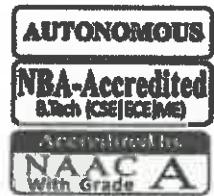
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e-mail: dvhama@mictech.ac.in, Website: www.mictech.ac.in



1.3 Methodology:

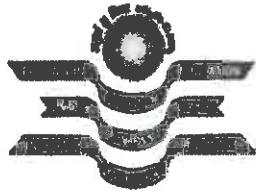
By using IoT system the smart agriculture is powered by NodeMCU. It includes the humidity sensor, temperature sensor, moisture sensor and DC motor. This system starts to check the humidity and moisture level. The sensors are used to sense the level of water and if the level is below the range then the system automatically starts watering. According to the change in temperature level the sensor does its job. IoT also shows the information of humidity, moisture level by including date and time. The temperature level based on type of crops cultivated can also be adjusted.

2. Total (in Rs): 50000

Date: 17.06.2019

Place: Kanchikacherla


Signature of the Principal Investigator



Research and Development Cell

10.07.2019

To

Mr. M. Sunil Kumar,
Assistant Professor,
Department of Electrical and Electronics Engineering,
Devineni Venkata Ramana & Dr. Hima Sekhar MIC College of Technology,
Kanchikacherla.

Sub: Letter of sanction

Dear M. Sunil Kumar,

The Management of Devineni Venkata Ramana & Dr. Hima Sekhar MIC College of Technology appreciate your efforts in submitting your proposal titled: "**IoT Based Smart Agriculture Monitoring System**" seeking a seed grant. After thorough scrutiny, the Research Advisory Committee of the Institution has selected and recommended your proposal for the sanction of Rs 50,000/- to work for a period of one Year.

This seed money grant is provided to enable you to undertake preliminary research work which can result either in a 'proof of concept' or 'proof of experience'. Further, you are expected to apply to external funding agencies (both public and private) to take the outcomes of this project to its intended goal.

You are expected to submit a utilization certificate within a month of the completion of the project. The work done under this project shall be used only for the benefit of the institution and it will not be used or transmitted to anywhere else. The conditions for the conduct of this work will be as per the Seed Grant Policy of the institution.

Wishing you good luck.

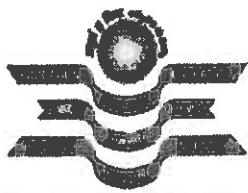
Principal

PRINCIPAL

Devineni Venkata Ramana & Dr. Hima Sekhar
MIC College of Technology
Kanchikacherla, Krishna District

Copy to:

- HOD, Department of EEE, MIC
- Account Section, MIC



Devineni Venkata Ramana & Dr.Hima Sekhar
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With Grade

PROJECT COMPLETION REPORT FOR INSTITUTE FUNDED SEED GRANT

- 1) Title of the project: : IoT Based Smart Agriculture Monitoring System
- 2) Name of the Principal Investigator(s) and Co-Investigator(s): Mr.M Sunil Kumar
- 3) Date of commencement: 10.07.2019
- 4) Proposed date of completion: 05.06.2020
- 5) Actual date of completion: 15.04.2020
- 6) Objectives as stated in the project proposal: To implement the modern technology in required fields like agriculture. Using IoT technology in agriculture, this system makes agriculture monitoring easy. IoT is to monitor the agriculture by using the wireless sensor networks and collect the data from different sensors which are deployed at various nodes and send by wireless protocol.
- 7) Deviation made from original objectives if any, while implementing the project and reasons thereof:
No
- 8) Details of experimental set up, methods adopted, data collected supported by necessary table, charts, diagrams & photographs:

Experimental set up	<ol style="list-style-type: none">1. Power section2. Soil Moisture sensor3. Relay4. Temperature sensor5. Water Pump6. ESP8266 module7. WiFi/Cloud Module
Methodology	By using IoT system the smart agriculture is powered by NodeMCU. It includes the humidity sensor, temperature sensor, moisture sensor and DC motor. This system starts to check the humidity and moisture level. The sensors are used to sense the level of water and if the level is below the range then the system automatically starts watering. According to the change in temperature level the sensor does its job. IoT also shows the information of humidity, moisture level by including date and time. The temperature level based on type of crops cultivated can also be adjusted.
Results	Using the sensor network in fields of agriculture makes clever irrigation. The information from IoT is sent to the client using cloud. Consequently,



any changes inside the crop may be identified effortlessly and early analysis is achieved as such.

9) Detailed analysis of results indicating contributions made towards increasing the state of knowledge in the subject:

Using IoT the system can predict the soil moisture level and humidity so that the irrigation system can be monitored and controlled. IoT works in different domains of farming to improve time efficiency, water management, crop monitoring, soil management and control of insecticides and pesticides. This system also minimizes human efforts, simplifies techniques of farming and helps to gain smart farming. Besides the advantages provided by this system, smart farming can also help to grow the market for farmer with single touch and minimum effort.

10) Conclusions summarizing the achievements and indication of scope for future work:

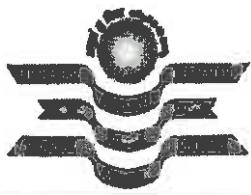
IoT will help to enhance smart farming. Using IoT the system can predict the soil moisture level and humidity so that the irrigation system can be monitored and controlled.

The project has vast scope in developing the system and making it more user friendly and the additional features of the system like:

- ✓ By installing a webcam in the system, photos of the crops can be captured and the data can be sent to database.
- ✓ Speech based option can be implemented in the system for the people who are less literate.
- ✓ GPS (Global Positioning System) can be integrated to provide specific location of the farmer and more accurate weather reports of agriculture field and garden.
- ✓ Regional language feature can be implemented to make it easy for the farmers who are aware of only their regional language.

11.Budget utilization:

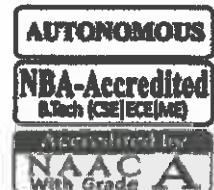
S.NO	Budget Head	Funds Sanctioned	Expenditure	% of Total cost
1	Recurring (in Rs) :	20000	Stationaries – 8000 Food & Refreshments – 2000 Connectivity - 5000 Travel Expenditure – 5000	40
2.	Non-Recurring (Equipment /	30000	1. Power section 2. Relay Driver 3. APFC Relay Panel	60



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	Instrument) (in Rs)	15000	4. Transformer 5. Mother Board 6. LCD Display 7. Loads	
3	Others, if any	Nil	Nil	Nil

12. Plan for utilizing the equipment facilities in the future, if any – Not applicable

Signature of the Principal Investigator

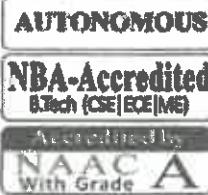
Date: 15.04.2020

Place: Kanchikacherla



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UTILIZATION CERTIFICATE

Certified that out of Rs 50,000 of institute funded seed grant for the "IoT Based Smart Agriculture Monitoring System" sanctioned during the Academic Year 2019-20 in favour of Mr.M Sunil Kumar from Department of Electrical and Electronics Engineering dated 10.7.2019 and a sum of Rs. 50,000 (Rupees Fifty Thousand only) has been utilized for the purpose for which it was sanctioned. The balance amount if any is refunded to the institution.


Signature of PI

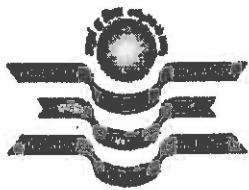

Signature of Accounts Officer


Signature of Head of the Institution

Devineni Venkata Ramana & Dr. Hima Sekhar
MIC College of Technology
KANCHIKACHERLA - 521 180.


PRINCIPAL

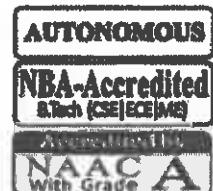
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FORMAT FOR INSTITUTE-FUNDED SEED GRANT PROPOSAL

Name of the Principal Investigator: Dr. P. Bhagath Singh

Designation: Assistant Professor

Department: Mechanical Engineering

Title of the Project: Experimental Investigation on Mechanical Properties of Aluminum Metal Matrix Composites

1. Background

1.1 Description of problem (Brief)

Over the last thirty years composite materials and ceramics have been the dominant emerging materials. The volume and number of applications of composite materials have grown steadily and conquering new markets relentlessly. Modern composite materials constitute a significant proportion of the engineered materials market ranging from everyday products to sophisticated niche applications. While composites have already proven their worth as weight-saving materials, the current challenge is to make them cost-effective. The efforts to produce economically attractive composite components have resulted in several innovative manufacturing techniques currently being used in the composites industry. It is obvious, especially for composites, that the improvement in manufacturing technology alone is not enough to overcome the cost hurdle. The composites industry has begun to recognize that the commercial applications of composites promise to offer much larger business opportunities than the aerospace sector due to the sheer size of the transportation industry. Thus the shift of composite applications from aircraft to other commercial uses has become prominent in recent years.

1.2 Rational for taking up the project:

The motivation for this project arises from the needs of the casting research group of the Mechanical Engineering Department to obtain Functionally Graded Materials for practical applications in order to characterize their mechanical and metallurgical properties, as well as to identify relevant processing parameters. Bearing in mind the main project goals design specifications were firstly established, upon the opinion and needs of future users. Then, the



state of the art in what concerns available centrifugal casting machines was characterized. Afterwards, the conceptual design was developed, based on the operation parameters and every output and input envisaged system variables. At this project stage, a sketch of the equipment was made, identified, and specified the main components as well as their interconnections. Finally, the design and selection of the system's components were performed according to the established requirements.

1.3 Description of Proposal

1.3.1 Objectives of the project (Brief and to the point)

The main objectives of the present work are as follows:

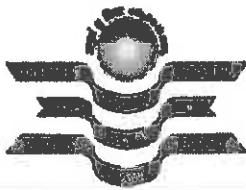
1. To design the centrifugal casting machine setup using Solid Works software
2. To fabricate the centrifugal casting machine setup based on the design
3. To produce small hallow cylindrical specimens by using a centrifugal casting machine setup
4. To Investigate the mechanical properties of each produced specimens

1.4 Innovative component of the project (Brief)

The design and fabrication of a horizontal casting machine setup to produce cylindrical hollow sections of metal matrix composites and aluminum 6082 is chosen as matrix material and boron carbide as reinforcement. The design of mould plays a major role in whole setup process. The cast specimens are produced by varying the three process parameters namely rotational speed of the mould, pouring temperature and percentage of reinforcement. By taguchi L9 method using these three parameters we can produce 9 different specimens. In order to reach to required centrifugal force, often big motors are needed. In such cases vibrations can occur for instance, the use of hydraulic motors is preferred over electronic ones because they offer smoother spinning. After producing the specimens, they have undergone several tests to get the mechanical properties along with the microstructure.

1.5 Methodology detailing stepwise activities and sub-activities

The major components of the centrifugal casting machine are designed to ensure the efficiency of performance by using Solid Works software. Assemble all the components to



get the design of the centrifugal casting machine setup. Fabricate the machine setup based on the design of each component. Centrifugal casting is used to cast thin-walled cylinders. Processing parameters play a very important role, which is pouring temperature and rotational speed. Based on the literature review, the matrix material and reinforcement are selected. With the help of an electrical weighing machine the required amount of material for casting is taken. Then the material is kept inside the furnace and set suitable temperature.

When the molten metal reaches to required temperature, it is poured into the rotating die of centrifugal casting setup. Immediately after pouring, the rotational speed of motor is set to required rpm and leave it for few minutes. Due to the centrifugal force the molten metal stick to the inner walls of the die and solidifies after cooling. After casting process, remove casting specimen from mould. Repeat this process for different specimens for different pouring temperature and for different speeds. Microstructure of the specimens is analyzed by using Optical microscope. Hardness is compared with the different casting speeds. Tensile tests are carried out with the universal testing machine.

2 Work Plan

Phase-wise plan of action up to post-project activities detailing time schedule.

Time	1-3 Months	4-6 Months	7-9 Months	10-12 Months
Activity	Literature survey	Problem identification and framing research design	Project Implementation & Finding	Preparing project reports & Paper Communication

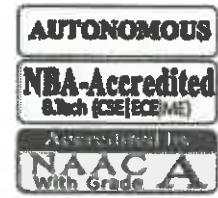
3. Expected Outcome and Deliverables of the Project

Attempts may be made to improve the mechanical properties of aluminum metal matrix composites produced by the centrifugal casting method.

In this project, the effect of various process parameters like the pouring temperature of the alloy inside the mold casting, the rotational speed of the mold and the percentage of reinforcement are 2.5%, 5% and 7.5% are the mechanical properties of composites are investigated. Three optimum process parameters will be used to produce better metal matrix composites.



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4. Likely Impact (Please attempt to quantify): Yes

5. Suggested Post Project Activities:

6. Budget estimate

A. Recurring (in Rs): 20000

B. Non-Recurring (Equipment / Instrument) (in Rs): 45,000

C. Total (in Rs): 65,000.00

Date: 05.06.2019

Place: Vijayawada

Signature of the Principal Investigator



Research and Development Cell

10.07.2019

To

Dr. P. Bhagath Singh,
Associate Professor,
Department of Mechanical Engineering
Devineni Venkata Ramana & Dr. Hima Sekhar MIC College of Technology,
Kanchikacherla.

Sub: Letter of sanction

Dear P. Bhagath Singh,

The Management of Devineni Venkata Ramana & Dr. Hima Sekhar MIC College of Technology appreciate your efforts in submitting your proposal titled: "**Experimental Investigation on Mechanical Properties of Aluminum Metal Matrix Composites**" seeking a seed grant. After thorough scrutiny, the Research Advisory Committee of the Institution has selected and recommended your proposal for the sanction of Rs 65,000/- to work for a period of one Year.

This seed money grant is provided to enable you to undertake preliminary research work which can result either in a 'proof of concept' or 'proof of experience'. Further, you are expected to apply to external funding agencies (both public and private) to take the outcomes of this project to its intended goal.

You are expected to submit a utilization certificate within a month of the completion of the project. The work done under this project shall be used only for the benefit of the institution and it will not be used or transmitted to anywhere else. The conditions for the conduct of this work will be as per the Seed Grant Policy of the institution.

Wishing you good luck.

Principal

PRINCIPAL

Devineni Venkata Ramana & Dr. Hima Sekhar
MIC College of Technology
Kanchikacherla, Krishna District

Copy to:

- HOD, Department of Mechanical Engineering, MIC
- Account Section, MIC



PROJECT COMPLETION REPORT FOR INSTITUTE-FUNDED SEED GRANT

- 1) **Title of the project:** Experimental Investigation on Mechanical Properties of Aluminum Metal Matrix Composites
- 2) **Name of the Principal Investigator:** Dr. P. Bhagath Singh
- 3) **Date of commencement:** 10.07.2019
- 4) **Proposed date of completion:** 30.06.2020
- 5) **Actual date of completion:** 17.07.2020
- 6) **Objectives as stated in the project proposal:**

In order to create cylindrical hollow sections of metal matrix composites, a horizontal casting machine configuration is designed and built. Aluminum 6082 is used as the matrix material and boron carbide is used as reinforcement. The mold's design is crucial to the entire setup procedure. The cast specimens are produced by varying the three process parameters namely rotational speed of the mould (1200, 1500, 1800 rpm), pouring temperature (690°C, 720°C, 750°C) and percentage of reinforcement (2.5%, 5%, 7.5% weight). By taguchi L9 method using these three parameters we can produce 9 different specimens. The use of hydraulic motors is preferred over electronic one because they offer smoother spinning. After producing the specimens, they have undergone several tests to get the mechanical properties along with microstructure. Tensile tests, Micro hardness tests and Micro structure tests were carried out to study the properties of aluminum metal matrix composites.

- 7) **Deviation made from original objectives if any, while implementing the project and reasons thereof:** No
- 8) **Details of experimental set up, methods adopted, data collected supported by necessary table, charts, diagrams & photographs:**

Experimental set up	centrifugal casting machine
---------------------	-----------------------------



Methodology	<p>Thin-walled cylinders are cast using centrifugal casting. Pouring temperature and rotational speed are two processing parameters that are crucial. The matrix material and reinforcement are chosen in accordance with the literature review. The necessary quantity of material for casting is taken with the use of an electronic weighing equipment. The material is then held inside the furnace while the temperature is fixed appropriately.</p> <p>The molten metal is injected into the centrifugal casting setup's revolving die once it reaches the necessary temperature. After pouring, the motor's rotational speed is set to the necessary rpm and left for a short period of time. The molten metal adheres to the inner die walls as a result of centrifugal force and solidifies there after cooling. Remove the casting specimen from the mold after the casting process. Repeat this procedure using various specimens, pouring temperatures, and pouring rates. The optical microscope is used to investigate the microstructure of the specimens. Various casting speeds are compared with hardness. A universal testing machine is used to perform tensile tests.</p>
Results	<ol style="list-style-type: none">1. The casting specimen 9's microstructure, which contained 7.5% boron carbide at 1800 rpm and 720°C, is depicted in the figure shown below using a camera with a 100x magnification in the current study. The size of the grains in the specimen is shown by the grain borders. The specimen's typical grain size is 26.24 microns.2. From the current investigation, the ideal conditions for hardness are 720°C of temperature, 1800 rpm of rotating speed, and 7.5 weight (% percent) of reinforcement. The parameter reinforcing weight of boron carbide is inferred to have the greatest impact on hardness.



3. The Micro hardness test is used to measure the permanent depth of indentation. Each specimen is subjected to hardness test with 2.5 mm ball indenter, 1 kg load and 8 seconds of dwell time. The variation in the hardness value of samples tested with respect to different percentage of reinforcement material, Rotational speed and pouring temperature.
4. Tensile strength of different sample weight proportion composites was tested using universal testing machine. The specimens are prepared as per ASTM E8 standard as shown in figure below. It is identified that the tensile strength of the sample AA 6082 with 7.5% reinforcement of B4C is higher than other two reinforcement sample of AA 6082 – 5% B4C and AA 6082 – 2.5% B4C.

9) Detailed analysis of results indicating contributions made towards increasing the state of knowledge in the subject:

It is identified that the tensile strength of the sample AA 6082 with 7.5% reinforcement of B4C is higher than other two reinforcement sample of AA 6082 – 5% B4C and AA 6082 – 2.5% B4C. Shows that the Ultimate Tensile Strength of the AMCs is enhanced with increased weight percentage of B4C particles content in the AA6082 matrix. Speed of mould is also responsible for increasing hardness of the Al6082- B4C composite. Another reason for increased hardness can be, attributed to sintering temperature. Because as the pouring temperature increases, the bonding between the matrix-reinforcement particles becomes stronger.

Taguchi Analysis has been carried out on Universal tensile strength versus Composition, Speed and Temperature. The main effect plot between hardness and rotational speed shows, as the rotational speed increases hardness also increases and reaches maximum value at 1800 rpm. The main effect plot between hardness and



rotational speed (rpm), a rotational speed is increased from 1500 rpm to 1800 rpm hardness is increased. The main effect plot between hardness and reinforcement weight percentage of Boron Carbide shows that as B4C is increased from 2.5% to 5% hardness slightly increases and from 5% to 7.5% of weight percentage of Boron Carbide, Hardness increased gradually. The optimal parameters of hardness are 1800 rpm, 7.5% B4C and 720°C. According, to present investigation, 720°C of temperature, 1800 rpm of rotational speed and 7.5 weight (%) of reinforcement gives optimum result for hardness. It can be inferred that the parameter reinforcement weight of Boron Carbide has the most significant effect on hardness.

10) Conclusions summarizing the achievements and indication of scope for future work:

- i. At higher rotational speeds of the mold fine grains will be formed with improved mechanical properties and at lower rotational speeds coarse grains will be formed with lower mechanical properties.
- ii. At a higher percentage of B4C we can get the high tensile strength at maximum speed that is 1800 rpm.
- iii. The microhardness also high at the same composition than the other compositions from the results. Material hardness decreases from the outer to inner diameter.
- iv. The microstructure analysis shows that the increase in the percentage of reinforcement leads to decrease in the grain size of the composite. The grain boundaries has the tightest on the outer diameter the grain boundaries tend to be constant in certain diameter.



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e mail: dvihemic@mictech.ac.in, Website: www.mictech.ac.in



11) Budget utilization:

Sr.	Budget Head	Funds Sanctioned	Expenditure	% of Total cost
1.	Recurring (in Rs):	20000	Stationaries – 8000 Food & Refreshments – 2000 Connectivity - 5000 Travel Expenditure – 5000	38.47
2.	Non-Recurring (Equipment / Instrument) (in Rs)	45,000	Tensile tests and Hardness tests	69.23
3.	Others, if any	Nil	Nil	Nil

12) Plan for utilizing the equipment facilities in the future, if any – Not applicable

Date: 17.07.2020

Place: Vijayawada


Signature of the Principal Investigator



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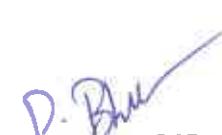
AUTONOMOUS

NBA-Accredited
B.Tech (CSE|ECE|ME)

Accredited to
NAAC A
With Grade

UTILIZATION CERTIFICATE

Certified that out of Rs 65,000 of institute-funded seed grant for the "Experimental Investigation on Mechanical Properties of Aluminum Metal Matrix Composites" sanctioned during the Academic Year 2019-20 in favour of Dr. P. Bhagath Singh from the Department of Mechanical Engineering dated 10.07.2019 and a sum of Rs. 65,000 (Rupees Sixty Five Thousand only) has been utilized for the purpose for which it was sanctioned. The balance amount if any is refunded to the institution.

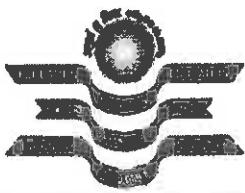

Signature of PI


Signature of Accounts Officer


Signature of Head of the Institution

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Kanchikacherla, Krishna District



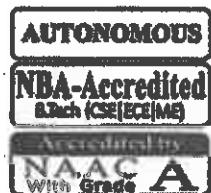
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FORMAT FOR INSTITUTE-FUNDED SEED GRANT PROPOSAL

Name of the Principal Investigator: Mr. R. Ranjith Kumar

Designation: Assistant Professor

Department: Mechanical Engineering

Title of the Project: Fabrication of Industrial 3D Printer

1. Background

1.1 Description of problem (Brief)

For over a century the visual world of printed scriptures has been dominated by the 2D printing methods. Be that easy to read or comprehend but when it comes to making of definite and real-life models it is sorely outsourced. Any 3-D model cannot be represented and displayed easily in a 2-D workplace. The only thing worth mentioning for likable perception is the rendering of the image. This ushered in the era of the much-needed idea of “3-D” printing.

3D Basically the singular purpose for the division of the 3D printer was to prepare 3-D samples directly on the bed of the printer. It has been an effective way of manufacturing since many companies are now opting for this type of method for their production operations. From the above introduction curiosity about Additive manufacturing, motivated us to work on 3D printing which is one of the additive manufacturing methods that make a component with low material wastage with minimum surface roughness and maximum hardness.

Additive manufacturing builds up parts by adding materials one layer at a time based on a computerized 3D solid model. It does not require the use of fixtures, cutting tools, coolants, and other auxiliary resources. It allows design optimization and the production of customized parts on demand. Its advantages over conventional manufacturing have captivated the imagination of the public, reflected in recent mainstream publications that call additive manufacturing “the third industrial revolution”. This industrial revolution takes changes. This paper reviews the societal impact of additive manufacturing from a technical perspective. The abundance of evidence were found to support the promises of additive manufacturing in the following areas customized healthcare products to improve population health and quality of life,

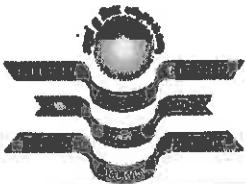


reduced environmental impact for manufacturing sustainability, and simplified supply chain to increase efficiency and responsiveness in demand fulfillment.

AliceMelocchi., Printing of Fused deposition modeling (FDM): This technique holds huge potential for the manufacturing of pharmaceutical products and is currently under extensive investigation. Challenges in this field are mainly related to the paucity of adequate filaments composed of pharmaceutical-grade materials, which are needed for feeding the FDM equipment. Accordingly, a number of polymers of common use in pharmaceutical formulations were evaluated as starting materials for fabrication via hot melt extrusion of filaments suitable for FDM processes. By using a twin-screw extruder, filaments based on insoluble, promptly soluble, enteric soluble and swellable/erodible, polymers were successfully produced, and the possibility of employing them for printing 600 μm thick disks was demonstrated. The behavior of disks as barriers when in contact with aqueous fluids was shown consistent with the functional application of the relevant polymeric components. The produced filaments were thus considered potentially suitable for printing capsules and coating layers for immediate or modified release, and, when loaded with active ingredients, any type of dosage forms.

J.M. Chacon et al., (2017) Fused deposition modeling is a rapidly growing additive manufacturing technology due to its ability to build functional parts having complex geometries. The mechanical properties of a built part depend on several process parameters. The aim of this study is to characterize the effect of build orientation, layer thickness and feed rate on the mechanical performance of PLA samples manufactured with a low-cost 3D printer. Tensile and three-point bending tests are carried out to determine the mechanical response of the printed specimens.

Stefan Junk et al., (2017) has written a paper on application of 3D (colour) printing for the visualization and optimization of complex metal forming processes. By this paper we learnt the additive manufacturing of 3D colour models based on simulation results are explored by means of examples from metal forming. Different 3D-printing processes are compared on the basis of quality as well as technical and economic criteria. Other examples from the fields joining by



upset-bulging of tubes and microstructure simulation are also analysed. This paper discusses the possibilities offered by the rapid progress and wide availability of 3D printers for the design and optimization of complex metal forming processes.

There are several 3D printing methodologies such as stereolithography apparatus (SLA), selective laser sintering (SLS), fused filament fabrication (FFF), and laminated object manufacturing (LOM). Fused filament fabrication (FFF) is one of the most popular technologies due to its simplicity. In FFF, a plastic filament from a coil is driven to the extrusion nozzle and then passes through the heater with the required melting temperature. The object is printed layer by layer with the flow of that melted material. After flowing through the extrusion nozzle, the material solidifies immediately. The application of pressure in the nozzle pushes the semisolid material out of the nozzle. The stable pressure and constant moving speed of the nozzle result in a uniform extrusion and, therefore, in a more accurate product.

1.2 Rational for taking up the project :

A key idea in the flourishing field of 3-D printing is the ability for printers to reproduce themselves, or to manufacture as many essential components as possible that are required to build a machine. Many consumer 3-D printers now come assembled with components that were themselves manufactured in 3-D. This year, a functioning pistol was designed and printed, with the computer-automated drawing schematics made readily available online.

1.3 Description of Proposal

1.3.1 Objectives of the project (Brief and to the point)

Although a number of advancements have been achieved in the FFF process, there are still some imperfections. First, the printing speed is relatively low compared to other printing methods. More time is needed to obtain thinner layers in order to build an object with more accurate and precise dimensional control. Second, the process has been limited to printing only one type of colored material at a time.

Every 3D printing user wants the distance between the print nozzle and bed to be uniform throughout the build area. But that's usually tough to attain given the expansion and contraction that takes place during the 3D printing process. The result is an unlevelled bed,



which is responsible for a plethora of common 3D printing problems, including clogging, scratch marks on your print, or general poor adhesion because the first layer is uneven. From the above literature review, it is known that various advancements made in 3D printers and various methodologies used for printing. Now our project is to fabricate a complex 3D printer with the following objectives.

1. Good quality of print
2. Accurate bed leveling system
3. Dual extrusion setup
4. High precision printing

1.4 Innovative component of the project (Brief)

A key idea in the flourishing field of 3-D printing is the ability for printers to reproduce themselves, or to manufacture as many essential components as possible that are required to build a machine. Many consumer 3-D printers now come assembled with components that were themselves manufactured in 3-D. This year, a functioning pistol was designed and printed, with the computer-automated drawing schematics made readily available online.

1.5 Methodology detailing stepwise activities and sub-activities

Flow Process: The following flow chart shows the methodology used by us in the construction of a 3D printer. The first step is to select one of the additive manufacturing processes among many processes. Then an appropriate mechanism is selected for X, Y and Z axis movements, considering various factors such as cost of fabrication, simplicity of design, synchronization, accuracy, etc. Once the mechanism is selected the next step is the integration of electronics and software then the machine is designed and fabricated. The last step is the synchronization of mechanical, electrical and software elements of the machine.

SELECTION OF PROCESS: The rundown of 3D printing innovations and procedures keeps on developing as 3D printing is continually evolving. The 3D printing industry continues upgrading its hardware and the materials and strategies to make prototypes or parts. Contingent upon numerous factors, for example, spending plan, outline or capacity, picking the fitting 3D printing process and also the correct material is imperative.



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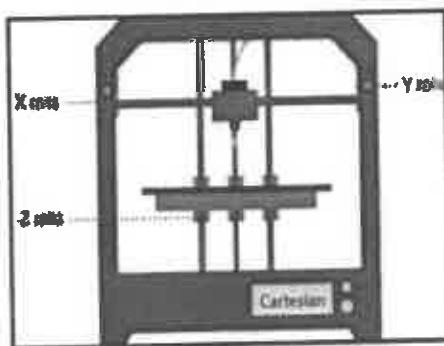
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The FDM technology is clean, simple to use and it is environmentally stable. Complex shapes and intricate parts can be printed. FDM is at the very entry of the market as it is mainly used by individuals. FDM is an affordable 3D printing process compared to other 3D printing technologies.

FDM starts with a product procedure that forms an STL file (stereolithography file format), scientifically cutting and situating the model for the building procedure. In the event that required, support structures might be created. The machine may apportion numerous materials to accomplish diverse objectives. The model or part is created by extruding a small amount of thermoplastic material to the desired shape layers as the material solidifies promptly after expulsion from the nozzle. A plastic filament or metal wire is loosened up from a loop and supplies material to an extrusion nozzle which can turn the flow on and off. There is commonly a worm drive that pushes the filament into the nozzle at a controlled rate. The nozzle is warmed to soften the material. The thermoplastics are warmed past their glass change temperature and are then saved by an expulsion head.

SELECTION OF MECHANISM: Presently mechanisms such as, for example, SCARA, Cartesian, Polar, Delta and so on are utilized as a part of development of FDM 3D Printers. We have chosen cartesian arrangement of developments, where the bed moves in the vertical heading i.e., in Z pivot bearing and the extruder spout moves horizontal way i.e., both in X and Y hub course. Z hub development on such a 3D printer is extremely exact and requires low increasing speeds, however the bed should be lightweight with a specific end goal to look after precision, which makes it harder to include a completely programmed bed leveling framework.





2 Work Plan

Phase-wise plan of action up to post-project activities detailing time schedule.

Time	1-3 Months	4-6 Months	7-9 Months	10-12 Months
Activity	Literature survey	Problem identification and framing research design	Project Implementation & Finding	Preparing project reports & Paper Communication

3. Expected Outcome and Deliverables of the Project

The final outcome we got here is a better and advanced 3D printer which has many advantages such as:

- Good quality of print
- Accurate bed leveling system
- Single and dual extrusion in one setup
- Better safe conditions for the user
- An automatic pause option when power breakdown occurs
- Capable of doing precision works

4. Likely Impact (Please attempt to quantify): Yes

5. Suggested Post Project Activities:

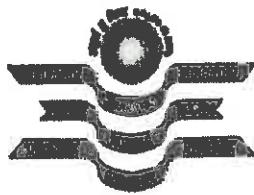
6. Budget estimate

- A. Recurring (in Rs): 15000
B. Non-Recurring (Equipment / Instrument) (in Rs): 35,000
C. Total (in Rs): 50,000.00

Date: 10.06.2019

Place: Vijayawada

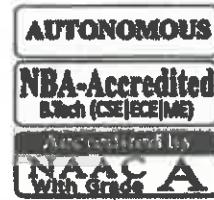
Signature of the Principal Investigator



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Research and Development Cell

10.07.2019

To

Mr. R. Ranjith Kumar,
Associate Professor,
Department of Mechanical Engineering
Devineni Venkata Ramana & Dr. Hima Sekhar MIC College of Technology,
Kanchikacherla.

Sub: Letter of sanction

Dear R. Ranjith Kumar,

The Management of Devineni Venkata Ramana & Dr. Hima Sekhar MIC College of Technology appreciate your efforts in submitting your proposal titled: "Fabrication of Industrial 3D Printing" seeking a seed grant. After thorough scrutiny, the Research Advisory Committee of the Institution has selected and recommended your proposal for the sanction of Rs 50,000/- to work for a period of one Year.

This seed money grant is provided to enable you to undertake preliminary research work which can result either in a 'proof of concept' or 'proof of experience'. Further, you are expected to apply to external funding agencies (both public and private) to take the outcomes of this project to its intended goal.

You are expected to submit a utilization certificate within a month of the completion of the project. The work done under this project shall be used only for the benefit of the institution and it will not be used or transmitted to anywhere else. The conditions for the conduct of this work will be as per the Seed Grant Policy of the institution.

Wishing you good luck.

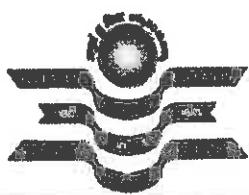
Principal

PRINCIPAL

Devineni Venkata Ramana & Dr Hima Sekhar
MIC College of Technology
Kanchikacherla, Krishna District'

Copy to:

- HOD, Department of Mechanical Engineering, MIC
- Account Section, MIC



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PROJECT COMPLETION REPORT FOR INSTITUTE-FUNDED SEED GRANT

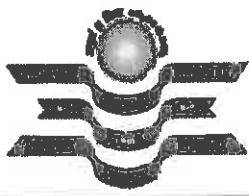
- 1) **Title of the project:** Fabrication of Industrial 3D Printer
- 2) **Name of the Principal Investigator:** Mr. R. Ranjith Kumar
- 3) **Date of commencement:** 10.07.2019
- 4) **Proposed date of completion:** 30.06.2020
- 5) **Actual date of completion:** 22.07.2020

- 6) **Objectives as stated in the project proposal:**

Although a number of advancements have been achieved in the FFF process, there are still some imperfections. First, the printing speed is relatively low compared to other printing methods. More time is needed to obtain thinner layers in order to build an object with more accurate and precise dimensional control. Second, the process has been limited to printing only one type or colored material at a time.

Every 3D printing user wants the distance between the print nozzle and bed to be uniform throughout the build area. But that's usually tough to attain given the expansion and contraction that takes place during the 3D printing process. The result is an unlevelled bed, which is responsible for a plethora of common 3D printing problems, including clogging, scratch marks on your print, or general poor adhesion because the first layer is uneven. From the above literature review, it is known that various advancements made in 3d printers and various methodologies used for printing. Now our project is to fabricate a complex 3D printer with the following objectives.

1. Good quality of print
 2. Accurate bed leveling system
 3. Dual extrusion setup
 4. High precision printing
-
- 7) Deviation made from original objectives if any, while implementing the project and reasons thereof: No



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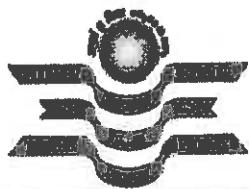
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- 8) Details of experimental setup, methods adopted, data collected supported by necessary table, charts, diagrams & and photographs:

Experimental setup	Micro Hardness
Methodology	<p>Flow Process: The following flow chart shows the methodology used by us in the construction of a 3D printer. The first step is to select one of the additive manufacturing processes among many processes. Then an appropriate mechanism is selected for X, Y and Z axis movements, considering various factors such as cost of fabrication, simplicity of design, synchronization, accuracy, etc. Once the mechanism is selected the next step is the integration of electronics and software then the machine is designed and fabricated. The last step is, the synchronization of mechanical, electrical and software elements of the machine.</p> <p>SELECTION OF PROCESS: The rundown of 3D printing innovations and procedures keeps on developing as 3D printing is continually evolving. The 3D printing industry continues upgrading its hardware and the materials and strategies to make protest or parts. Contingent upon numerous factors, for example, spending plan, outline or capacity, picking the fitting 3D printing process and also the correct material is imperative.</p> <p>The FDM technology is clean, simple to use and it is environmentally stable. Complex shapes and intricate parts can be printed. FDM is at the very entry of the market as it mainly used by individuals. FDM is an affordable 3D printing process compared to other 3D printing technologies.</p> <p>FDM starts with a product procedure which forms an STL file (stereolithography file format), scientifically cutting and situating the model for the building procedure. In the event that required, support structures might be created. The machine may apportion numerous</p>



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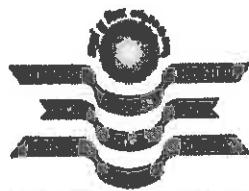
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materials to accomplish diverse objectives. The model or part is created by extruding little amount of thermoplastic material to the desired shape layers as the material solidifies promptly after expulsion from the nozzle. A plastic filament or metal wire is loosened up from a loop and supplies material to an extrusion nozzle which can turn the flow on and off. There is commonly a worm drive that pushes the filament into the nozzle at a controlled rate. The nozzle is warmed to soften the material. The thermoplastics are warmed past their glass change temperature and are then saved by an expulsion head.

SELECTION OF MECHANISM: Presently mechanisms such as, for example, SCARA, Cartesian, Polar, Delta and so on are utilized as a part of the development of FDM 3D Printers. We have chosen a cartesian arrangement of developments, where the bed moves in the vertical heading i.e., in Z pivot bearing and the extruder spout moves horizontally way i.e., both in X and Y hub course. Z hub development on such a 3D printer is extremely exact and requires low increasing speeds, however, the bed should be lightweight with a specific end goal to look after precision, which makes it harder to include a completely programmed bed leveling framework. Controlling a straight Cartesian framework like this is mechanically straightforward and furthermore generally simple from a product point of view, which is the reason most 3D printers available today utilize this kind of plan. The Cartesian arrange framework has for quite some time been utilized for instruments like plotters, CNC processing machines, and 2D printers.



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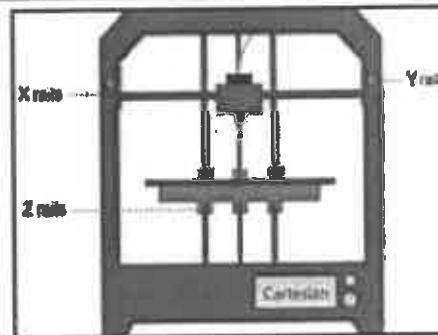
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Results	After the procurement of the whole tool kit, a detailed study of all the components is made so as to gain knowledge about the working procedure and connection of each part. Then the 3D printer is structured using a manual, with the help of the internet and some experts. Electronic parts are connected very carefully so as to avoid any kind of accidents. After building the 3d printer it is put into working condition and some products are manufactured. Here is an image of a working 3-D printer manufacturing a product sample.
----------------	---

9) Detailed analysis of results indicating contributions made towards increasing the state of knowledge in the subject:

After the procurement of the whole tool kit, a detailed study of all the components is made so as to gain knowledge about the working procedure and connection of each part. Then the 3D printer is structured using a manual, with the help of the internet and some experts. Electronic parts are connected very carefully so as to avoid any kind of accidents. After building the 3d printer it is put into working condition and some products are manufactured. Here is an image of a working 3-D printer manufacturing a product sample.



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Some other objects printed by our printer:





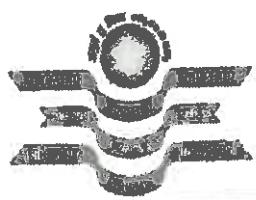
The outcome of this project was to build a portable 3D Printer which has been successfully completed. The design of the frame is made robust and compact using aluminum sections. The material selection of the various elements is economical. Using a single motor for vertical movement along with a proximity sensor makes bed leveling easy and the bed movement is monitored with resolution in microns. The drawback in few of the 3D Printer which uses bed.

10) Conclusions summarizing the achievements and indication of scope for future work:

The outcome of this project was to build a portable 3D Printer which has been successfully completed. The design of the frame is made robust and compact using aluminum sections. The material selection of the various elements is economical. Using a single motor for vertical movement along with a proximity sensor makes bed leveling easy and the bed movement is monitored with resolution in microns. The drawback in few of the 3D Printer which uses bed movement in Y axis has distortion of the printed layer at high rates of printing. To overcome this drawback, a new mechanism has been developed which uses bed movement in Z. The control of the mechanism becomes easy because of less number of motors and good synchronization can be achieved using this new 3D printer technique.

The final outcome we got here is a better and advanced 3d printer which have many advantages such as:

- Good quality of print
- Accurate bed leveling system
- Single and dual extrusion in one setup
- Better safe conditions for the user
- An automatic pause option when power breakdown occurs
- Capable of doing precision works



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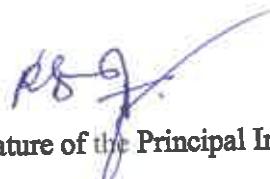
11) Budget utilization:

Sr.	Budget Head	Funds Sanctioned	Expenditure	% of Total cost
1.	Recurring (in Rs) :	15000	Stationaries – 8000 Food & Refreshments – 2000 Connectivity - 2000 Travel Expenditure – 3000	30
2.	Non-Recurring (Equipment / Instrument) (in Rs)	35,000	Residual stress measurement	70
3.	Others, if any	Nil	Nil	Nil

12) Plan for utilizing the equipment facilities in future, if any – Not applicable

Date: 22.07.2020

Place: Kanchikacherla


Signature of the Principal Investigator



Devineni Venkata Ramana & Dr.Hima Sekhar
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UTILIZATION CERTIFICATE

Certified that out of Rs 50,000 of institute-funded seed grant for the "Fabrication of Industrial 3D Printer" sanctioned during the Academic Year 2019-20 in favour of R. Ranjith Kumar from the Department of Mechanical Engineering dated 10.07.2019 and a sum of Rs. 50,000 (Rupees Fifty Thousand only) has been utilized for the purpose for which it was sanctioned.
The balance amount if any is refunded to the institution.

Signature of PI

Signature of Accounts Officer

Devineni Venkata Ramana & Dr. Hima Sekhar
MIC College of Technology
KANCHIKACHERLA - 521 180.

Signature of Head of the Institution

PRINCIPAL

Devineni Venkata Ramana & Dr Hima Sekhar
MIC College of Technology
Kanchikacherla, Krishna Distri.



Devineni Venkata Ramana & Dr.Hima Sekhar
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FORMAT FOR INSTITUTE FUNDED SEED GRANT PROPOSAL

Name of the Principal Investigator: B.R.K SINGH

Designation: Associate Professor

Name of the Co-Investigator (if any): Nil

Designation: Nil

Department: Electronics and Communication Engineering

Title of the Project: SMART IRRIGATION SYSTEM USING IoT

1. Background

1.1 Description of problem

Agriculture plays a vital role in world-wide economy. It is the main source of sustenance for people. It is necessary to make economical utilization of resources as per the environmental conditions, to fulfil the fundamental needs of the crops. This work includes improvement in the previous work; here drip irrigation is used instead of normal irrigation method. It's been long since sensors were introduced in the agriculture operations. But the problem with the traditional approach of utilizing sensor technology was that we were not able to get the live data from the sensors. The sensors used to log the data into their attached memory and later on we were able to use it. To improve traditional methods, there has been many systems developed using advanced technologies that help to reduce crop wastes, prevent excessive and scarce watering to crops and thereby increase the crop yield. With the introduction of Industrial IoT in Agriculture, far more advanced sensors are being utilized. The sensors are now connected to the cloud via cellular/satellite network. This lets us to know the real-time data from the sensors, making decision making effective. The applications of IoT in the agriculture industry have helped the farmers to monitor the water tank levels in real-time which make the irrigation process more efficient. The advancement of IoT technology in agriculture operations has brought the use of sensors in every step of the farming process like how much time and resources a seed takes to become a fully-grown vegetable.



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1.2 Rational for taking up the project:

In the proposed system instead of normal irrigation type we use drip irrigation method where the water can be directed to the root in sufficient amount so that water as well crop management can be improved. Using IoT the drip irrigation method is automated with the help of sensors and pipe tubes. Various sensors such as temperature, soil moisture sensors are used in field monitoring and the ground water level can be monitored lively using the float switch where the fall in water level can be notified to the farmer through SMS. If the field is dry it can also be notified to the farmer to his mobile and the motor will be switched ON and if the moisture level attains a certain level the motor is switched OFF automatically without manual instruction. The farmer can monitor the field and water level either through the web page which updates field information lively or through SMS in mobile phone. Thus, through the Web interfaced processor and relay switches the water management is controlled and information is delivered to the user

1.3 Description of Proposal

1.3.1 Objectives of the project

In this work we use drip irrigation where the water was allowed to drip slowly to the roots of plant either from above the soil surface or buried into the surface so that the water can be placed directly into the root zone and minimize evaporation. It uses temperature sensor, soil humidity sensor to collect and monitor field information and also uses float switches to monitor ground water level through web page. When the field gets dry and ground water level falls down, it will be notified through SMS. This provides a solution for the problems in developing a smart farming system. It uses node MCU, relay and water pump.

1.4 Innovative component of the project

The system consists of the sensors connected to the node MCU which is a software embedded microprocessor which controls the sensors and delivers the information from the sensors to the web page. The node MCU and relay are connected to the power supply and motor is connected with relay for automatic ON/OFF. the circuit connection of system where the microcontroller is embedded with software code and the float sensor along with water pump control is connected to the node MCU and the soil moisture sensor is grounded in soil which collects the soil moisture



attributes and sends soil information to the microcontroller which can be stored in the cloud storage.

1.5 Methodology detailing stepwise activities and sub-activities

In drip irrigation systems, pump and valves may be manually or automatically operated by a controller. Most large drip irrigation systems employ some type of filter to prevent clogging of the small emitter flow path by small waterborne particles. New technologies are now being offered that minimize clogging. Drip and subsurface drip irrigation is used almost exclusively when using recycled municipal wastewater. Regulations typically do not permit spraying water through the air that has not been fully treated to potable water standards. Because of the way the water is applied in a drip system, traditional surface applications of timed-release fertilizer are sometimes ineffective, so drip systems often mix liquid fertilizer with the irrigation water. An emitting pipe is a type of drip irrigation tubing with emitters pre-installed at the factory with specific distance and flow per hour as per crop distance. An emitter restricts water flow passage through it, thus creating head loss required (to the extent of atmospheric pressure) in order to emit water in the form of droplets. This head loss is achieved by friction/turbulence within the emitter. The soil moisture sensors are placed at every few feet with the probes in the ground. The soil moisture sensor is set to a particular level based on the type of soil and the crops being grown. The soil moisture is checked through the sensor. The sensors value is then sent to the NodeMCU or the Wi-Fi module. Since this acts like an Arduino but can be connected to the Wi-Fi, the sensor reading are checked and matched to the set value of reading. If the value of the soil moisture sensor is equal to the set value, then a command is sent to the relay to switch OFF the motor. A message is then sent to the client's mobile which is connected to the Node. If the moisture of the soil is less, then the Node MCU sends a command to the relay to turn ON the motor. When the water is opened, the drip irrigation system starts to drip the water at the roots. It allows water for half an hour and after half an hour; the moisture level is again checked and sent to the Node MCU. A message is sent to the client device saying that the plants have been watered at that particular time. The process then repeats all over. The intention of this project is to provide the user far away from the fields, a chance to keep an eye on their plants.

02: Work Plan



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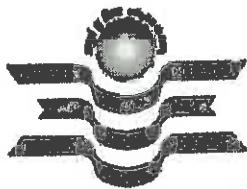
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Phase-wise plan of action up to post project activities detailing time schedule.

Time	1-3 Months	4-6 Months	7-9 Months	10-12 Months
Activity	Literature survey	Problem identification & Framing research design	Project Implementation & Finding	Preparing project report & Paper Communication

3. Expected Outcome and Deliverables of the Project

The below screenshot is the web page design of the system where the home page contains the project details and the developer details with the link word as "Get in!". By clicking on the "Get in!" link one can enter into the next page where the sensor information of the field will be displayed. The above screenshot is the web page design of the system where the home page contains the project details and the developer details with the link word as "Get in!". By clicking on the "Get in!" link one can enter into the next page where the sensor information of the field will be displayed. The "Get in!" link provided in the home age will direct through the next age which contains live monitoring information about the field. Using the mobile hotspot with the specified user name and password in the hardware embedded code any mobile or system can access the field information. The details include temperature of the field where the temperature sensor in the field provides field environmental temperature through the WiFi module and the web page access the updated information from cloud. The Soil status displays of the condition of the soil whether it is dry or normal if it is dry then the water pump will be switched ON and the water will be pumped as drips into the field through the pipelets near the crops over the field. when the level reaches the threshold value it will be turned OFF and if it is normal then the water pump will be stopped. Both the soil and temperature sensor provides the timing condition of the field and the time will also be displayed in the web page so that one could monitor and gather information about the status of field at any time. The Ground water level i.e., float value which notifies the sufficient water level in the water source for example well. When the ground water level drops less than the sufficient water level which is needed to supply to the field efficiently then the notification is send to the user mobile through SMS offline and he can further check the details in the web page online with the exact date and time It is simple yet useful system where it will increase the proper maintenance of the field using IoT technology the farmer or the user can monitor the information of the soil which is main source of agriculture and water is provided based on the condition of the field and the temperature can also be monitored so that the farmer can decide what type of crop can be planted and what will be outcome based on their experience.



4. Likely Impact(Please attempt to quantify) : Yes

5. Suggested Post Project Activities:

Future work could be focused more on increasing sensors on this system to fetch more data especially with regard to Pest Control and by also integrating GPS module in this system to enhance this Agriculture IoT Technology to full-fledged Agriculture Precision ready product. Even though the proposed work can be applied in real time it can be enhanced by developing this system for large acres of land. Also the system can be integrated to check the quality of the soil and the growth of crop in each soil.

6. Budget estimate

A. Recurring (in Rs) :25000

B. Non-Recurring (Equipment/Instrument)(in Rs) :15,000

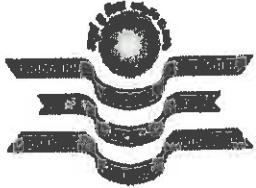
S. No	Sensor Type	Parameter Measured	Quantity
1	Node MCU -ESP8266	Open source LUA based firmware	2
2	Float Switch Sensor	High a speed and too low a torque	2
3	Temperature Sensor	Senses the temperature	2
4	Soil Moisture	Measure humidity of soil	2
5	Motor	To ON the water pump	1
6	Power Supply	supplying logic power supply (Vss) from the motor power supply(Vs)	1
7	12V battery	Linear regulated 12VDC power	1

C. Total (in Rs):40,000

Date: 25-06-2019

Place: Kanchikacherla

Signature of the Principal Investigator



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Research and Development Cell

10.07.2019

To

Mr. B. Radha Krishna Singh,
Professor,
Department of Electronics and Communication Engineering,
Devineni Venkata Ramana & Dr. Hima Sekhar MIC College of Technology,
Kanchikacherla.

Sub: Letter of sanction

Dear B. Radha Krishna Singh,

The Management of Devineni Venkata Ramana & Dr. Hima Sekhar MIC College of Technology appreciate your efforts in submitting your proposal titled: "Smart Irrigation System Using IoT" seeking a seed grant. After thorough scrutiny, the Research Advisory Committee of the Institution has selected and recommended your proposal for the sanction of Rs 40,000/- to work for a period of one Year.

This seed money grant is provided to enable you to undertake preliminary research work which can result either in a 'proof of concept' or 'proof of experience'. Further, you are expected to apply to external funding agencies (both public and private) to take the outcomes of this project to its intended goal.

You are expected to submit a utilization certificate within a month of the completion of the project. The work done under this project shall be used only for the benefit of the institution and it will not be used or transmitted to anywhere else. The conditions for the conduct of this work will be as per the Seed Grant Policy of the institution.

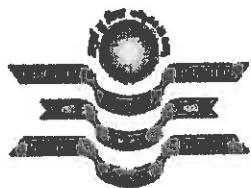
Wishing you good luck.

Principal PRINCIPAL

Devineni Venkata Ramana & Dr Hima Sekhar
MIC College of Technology
Kanchikacherla, Krishna Distt/

Copy to:

- HOD, Department of ECE, MIC
- Account Section, MIC



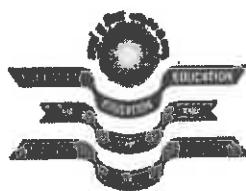
PROJECT COMPLETION REPORT FOR INSTITUTE FUNDED SEED GRANT

- 1) Title of the project: Smart Irrigation System using IoT
- 2) Name of the Principal Investigator(s) and Co-Investigator(s): B.R.K SINGH
- 3) Date of commencement: 10.07.2019
- 4) Proposed date of completion: 31.06.2020
- 5) Actual date of completion: 15.07.2020
- 6) Objectives as stated in the project proposal:

In this work we use drip irrigation where the water was allowed to drip slowly to the roots of plant either from above the soil surface or buried into the surface so that the water can be placed directly into the root zone and minimize evaporation. It uses temperature sensor, soil humidity sensor to collect and monitor field information and also uses float switches to monitor ground water level through web page. When the field gets dry and ground water level falls down, it will be notified through SMS. This provides a solution for the problems in developing a smart farming system. It uses node MCU, relay and water pump.

- 7) Deviation made from original objectives if any, while implementing the project and reasons there of: No
- 8) Details of experimental set up, methods adopted, data collected supported by necessary table, charts, diagrams & photographs:

Experimental set up	Node MCU -ESP8266 Float Switch Sensor Temperature Sensor Soil Moisture Motor Driver- L298 Power Supply 12V battery
Methodology	In drip irrigation systems, pump and valves may be manually or automatically operated by a controller. Most large drip irrigation systems employ some type of filter to prevent clogging of the small



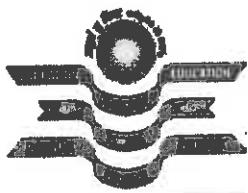
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emitter flow path by small waterborne particles. New technologies are now being offered that minimize clogging. Drip and subsurface drip irrigation is used almost exclusively when using recycled municipal wastewater. Regulations typically do not permit spraying water through the air that has not been fully treated to potable water standards. Because of the way the water is applied in a drip system, traditional surface applications of timed-release fertilizer are sometimes ineffective, so drip systems often mix liquid fertilizer with the irrigation water. An emitting pipe is a type of drip irrigation tubing with emitters pre-installed at the factory with specific distance and flow per hour as per crop distance. An emitter restricts water flow passage through it, thus creating head loss required (to the extent of atmospheric pressure) in order to emit water in the form of droplets. This head loss is achieved by friction/turbulence within the emitter. The soil moisture sensors are placed at every few feet with the probes in the ground. The soil moisture sensor is set to a particular level based on the type of soil and the crops being grown. The soil moisture is checked through the sensor. The sensors value is then sent to the NodeMCU or the Wi-Fi module. Since this acts like an Arduino but can be connected to the Wi-Fi, the sensor reading are checked and matched to the set value of reading. If the value of the soil moisture sensor is equal to the set value, then a command is sent to the relay to switch OFF the motor. A message is then sent to the client's mobile which is connected to the Node. If the moisture of the soil is less, then the Node MCU sends a command to the relay to turn ON the motor. When the water is opened, the drip irrigation system starts to drip the water at the roots. It allows water for half an hour and after half an hour, the moisture level is again checked and sent to the Node MCU. A



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	<p>message is sent to the client device saying that the plants have been watered at that particular time. The process then repeats all over. The intention of this project is to provide the user far away from the fields, a chance to keep an eye on their plants.</p>
Results	<p>The below screenshot is the web page design of the system where the home page contains the project details and the developer details with the link word as “Get in!”. By clicking on the “Get in!” link one can enter into the next page where the sensor information of the field will be displayed. The above screenshot is the web page design of the system where the home page contains the project details and the developer details with the link word as “Get in!”. By clicking on the “Get in!” link one can enter into the next page where the sensor information of the field will be displayed. The “Get in!” link provided in the home age will direct through the next age which contains live monitoring information about the field. Using the mobile hotspot with the specified user name and password in the hardware embedded code any mobile or system can access the field information. The details include temperature of the field where the temperature sensor in the field provides field environmental temperature through the WiFi module and the web page access the updated information from cloud. The Soil status displays of the condition of the soil whether it is dry or normal if it is dry then the water pump will be switched ON and the water will be pumped as drips into the field through the pipelets near the crops over the field. When the level reaches the threshold value it will be turned OFF and if it is normal then the water pump will be stopped. Both the soil and temperature sensor provides the timing condition of the field and the time will also be displayed in the web page so that one could monitor and gather information about the status of field at any</p>



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time. The Ground water level i.e., float value which notifies the sufficient water level in the water source for example well. When the ground water level drops less than the sufficient water level which is needed to supply to the field efficiently then the notification is send to the user mobile through SMS offline and he can further check the details in the web page online with the exact date and time It is simple yet useful system where it will increase the proper maintenance of the field using IoT technology the farmer or the user can monitor the information of the soil which is main source of agriculture and water is provided based on the condition of the field and the temperature can also be monitored so that the farmer can decide what type of crop can be planted and what will be outcome based on their experience.

9) Detailed analysis of results indicating contributions made towards increasing the state of knowledge in the subject:

The system involves three layers of operations, namely, sensor layer, transport layer, application layer. Their functions are as follows:

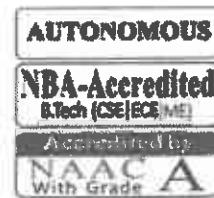
- **Sensor/Information Collection Layer:** The main task of this layer is to achieve automatic and real-time transformation of the physical figures of real-world agricultural production into digital information or data that can be processed in virtual world through various means. The main task of Information collection layer is to mark the various kinds of information, and collect the marked information and the physical information in the real world by sensing techniques, and then transform them to digital information for processing. Information collection layer involves these techniques: two-dimension code labels and readers, RFID tags and readers, cameras, GPS sensors, terminals, cable networks, sensor networks and wireless networks
- **Transport/Network Layer:** The main task of this layer is to collect and summarize the agricultural information acquired through Sensor Layer for processing. Transport Layer is



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the nerve centre and cerebra of Internet of Things for Agriculture, transmitting and processing data. The network layer includes the integration of the Internet network and telecommunication, network management centre, information centre and intelligent processing centers.

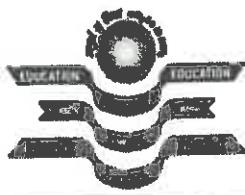
- Application Layer: The main task of this layer is to analyze and process the information collected so as to cultivate digital awareness of the real word. It is a combination of IoT and Agricultural Market intelligence.

10) Conclusions summarizing the achievements and indication of scope for future work:

Drip irrigation automation with live monitoring has been proposed using Wi-Fi module and Cloud Computing, The System has high efficiency and accuracy in fetching the live data of fields such as soil moisture level and temperature including the ground water level. Whether it is online or offline the notification for the ground water level drop can be notified through mobile or system. This system has also improved the normal agricultural irrigation process by using drip irrigation which is used in less water wastage.

11) Budget utilization:

Sr.	Budget Head	Funds Sanctioned(Rs)	Expenditure	% of Total cost
1.	Recurring (in Rs) :	25000	Stationeries – 8000 Food & Refreshments – 5000 Connectivity - 5000 Travel Expenditure – 7000	62.5
2.	Non-Recurring (Equipment/Instrument) (in Rs)	15000	1. Node MCU -ESP8266 2. Float Switch Sensor 3. Temperature Sensor 4. Soil Moisture 5. Motor Driver- L298 6. Power Supply	37.5



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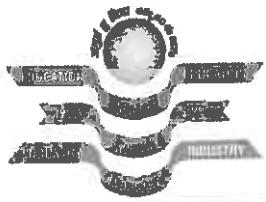
		7. 12V battery		
3.	Others, if any	Nil	Nil	Nil

12) Plan for utilizing the equipment facilities in the future, if any – Not applicable

Signature of the Principal Investigator

Date: 15.07.2019

Place: Kanchikacherla



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AUTONOMOUS

NBA-Accredited
B.Tech (CSE|ECE|ME)

Accredited by
NAAC **A**
With Grade

UTILIZATION CERTIFICATE

Certified that out of Rs 40,000 of institute funded seed grant for the "Smart Irrigation System Using IoT" sanctioned during the Academic Year 2019-20 in favour of Mr. B. Radha Krishna Singh from Department of Electronics and Communication Engineering dated 10.7.2019 and a sum of Rs. 40,000 (Rupees Forty Thousand only) has been utilized for the purpose for which it was sanctioned. The balance amount if any is refunded to the institution.


Signature of PI

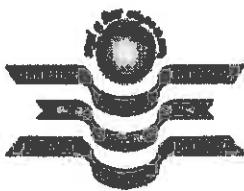

Signature of Accounts Officer


Signature of Head of the Institution

Devineni Venkata Ramana & Dr. Hima Sekhar
MIC College of Technology
KANCHIKACHERLA - 521 180.

PRINCIPAL

Devineni Venkata Ramana & Dr. Hima Sekhar
MIC College of Technology
Kanchikacherla, Krishna District'



FORMAT FOR INSTITUTE FUNDED SEED GRANT PROPOSAL

Name of the Principal Investigator: G. Anantha Lakshmi

Designation: Assistant Professor

Name of the Co-Investigator (if any): Nil

Designation: Nil

Department: Electronics and Communication Engineering

Title of the Project: IoT Based Air Pollution Monitoring System

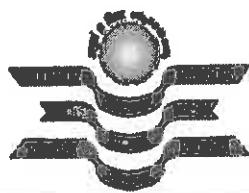
1. Background

1.1 Description of problem

The Internet has become ubiquitous and popular in almost every corner of the globe and is affecting human life in an unimaginable way. So we are now entering an era of "Internet of Things (IoT)". It includes traditional computing devices like laptops, tablets and smart phones, but also includes a growing list of other devices that have recently become internet enabled. Examples include home appliances, automobiles, wearable electronics, security cameras and lots of other things. In order for a device to be part of the Internet of Things, it must be able to communicate with other devices. Therefore, it requires some sort of built-in wired or wireless communication. Most IoT devices are Wi-Fi enabled, but Bluetooth also can be used to transfer data to nearby devices. IoT devices are commonly called "smart devices", since they're ready to communicate with other things. Along with the capacity to speak, many IoT devices also include an array of sensors that provide useful information. While the Internet of Things is still in its infancy, it provides promising opportunities for the future. In time, the web of Things will supersede of an abstract idea and more of how of life.

1.2 Rational for taking up the project:

Nowadays the air condition is very polluted. In recent years, car emissions, chemicals from factories, smoke, and dust are everywhere. That is the reason why now air condition is very polluted. The effect of air pollution is very bad for our health, especially for a place where the air in our body is taken for breathing. Air pollution cannot be detected by human feelings. Air pollution may contain a lot of dangerous substances such as ozone, particulate matter sulphur dioxide, nitrogen dioxide, carbon monoxide, and lead. This proposed system uses a wireless sensor network with low-cost sensors and hardware components along the necessary software to effectively monitor the air pollution phenomenon. Air pollution is the worst environmental problem and it causes a multitude of adverse effects on human health, water bodies, and climate. The main source of air pollution in all major cities is due to vehicles and the second major source remains the industries. The air pollution monitoring system is installed in a particular locality where there are traces of acute air pollution to detect the constituent gases of air which may lead to harmful effects on human health and other living beings. Substances in the polluted air are



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very dangerous. For example, if the carbon monoxide is above 100ppm, it makes humans feel dizzy, nauseous, and within minutes they could die. This research makes humans find out which content of the air is polluted. With module node MCU esp8266, we can monitor the air pollution remotely, because there is a Wi-Fi module in node MCU esp8266. This makes the air condition can be monitored every time

1.3 Description of Proposal

1.3.1 Objectives of the project

Air pollution affects our day to day activities and quality of life. It poses a threat to the ecosystem and the quality of life on the planet. The dire need to monitor air quality is very glaring, owing to increased industrial activities over the past years. People need to know the extent to which their activities affect air quality. This project proposes an air pollution monitoring system. The system was developed using the Arduino microcontroller. The air pollution monitoring system was designed to monitor and analyze air quality in real-time and log data to a remote server, keeping the data updated over the internet. Air quality measurements were taken based on the Parts per Million (PPM) metrics and analyzed using Microsoft Excel. The air quality measurements taken by the designed system was accurate. The result was displayed on the designed hardware's display interface and could be accessed via the cloud on any smart mobile device.

1.4 Innovative component of the project

1. Air quality using ZigBee

- This project discusses a monitoring system that gives information about environmental conditions and briefly touches the technological advancements in monitoring the environment and bringing out the new scope in monitoring the current environmental problems
- The system is developed using Arduino, Raspberry Pi 3, and ZigBee which proves to be cost-ineffective and having low power consumption.
- The sensors will gather the data of various environmental parameters and provide that data to Raspberry Pi via ZigBee from the Arduino. The sensors will gather the data of various environmental parameters and provide it to the raspberry pi which acts as a base station. Realization of data gathered by sensors is displayed on Raspberry pi 3 based Web servers.
- Experimental results demonstrated that the system can accurately measure the concentrations of carbon monoxide, carbon dioxide, combustible gases, smoke, and air quality.

2. Air Quality Monitoring Using Raspberry Pi

- A prototype for an Environmental Air Pollution Monitoring System for monitoring the concentrations of major air pollutant gases has been developed.



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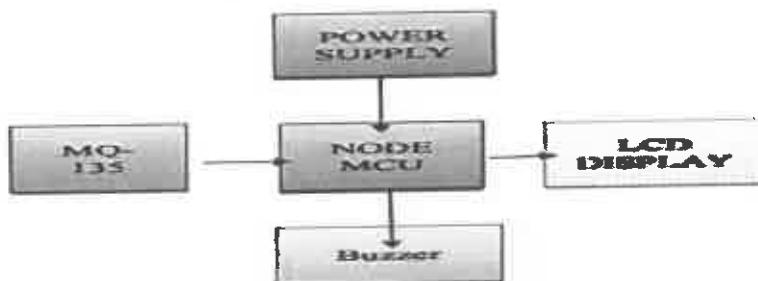
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- The system uses low-cost air-quality monitoring nodes comprised of a low-cost semiconductor gas sensor with a Wi-Fi module. This system measures concentrations of gases such as CO, CO₂, SO₂, and NO₂ using semiconductor sensors.
- A MEAN stack is developed to display data over a website.
- The fundamental aspect of the proposed work is to provide a low-cost infrastructure to enable data collection and dissemination to all stakeholders.

1.5 Methodology detailing stepwise activities and sub-activities

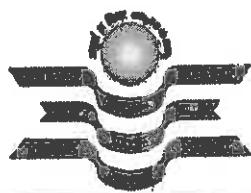
In the hardware part we are using Lcd, power supply, Jumper wires, MQ135 air quality sensor, and Node MCU this sensor is used to detect CO₂, CO, Ammonia as well as smoke. Followed by Node MCU also called as ESP8266 wifi chip why we are using means we need to push this data to the cloud because Arduino doesn't have wifi capacity so that we use this chip and connect this wifi to our mobile hotspot 5V Power supply is one of the most common power supply in use today. H44780 Character LCD is an industry-standard LCD Display device for interfacing with embedded systems. Here we are using 16X2 Configuration 4-bit write mode in this project. We use electromagnet inside the Buzzer In the software part we are using a platform called Things Speak. There is a MATLAB Option also available. we created the Twitter account also for observation of output.



02: Work Plan

Phase-wise plan of action up to post project activities detailing time schedule.

Time	1-3 Months	4-6 Months	7-9 Months	10-12 Months
Activity	Literature survey	Problem identification & Framing research	Project Implementation & Finding	Preparing project report & Paper Communication



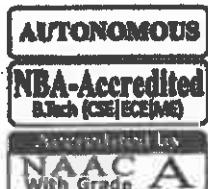
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design

3. Expected Outcome and Deliverables of the Project

ESP8266 Wi-Fi module gives the project access to Wi-Fi or the internet. It is a very cheap device and makes your projects very powerful. It can communicate with any microcontroller and it is the most leading device in the IoT platform. Learn more about here. Then we will connect the MQ135 sensor with the Arduino. Connect the VCC and the ground pin of the sensor to the 5V and ground of the Arduino and the Analog pin of the sensor to the A0 of the Arduino. Connect a buzzer to pin 8 of the Arduino which will start to beep when the condition becomes true. The MQ135 sensor can sense NH₃, NO_x, alcohol, Benzene, smoke, CO₂, and some other gases, so it is a perfect gas sensor for our Air Quality Monitoring Project. When we will connect it to Arduino then it will sense the gases, and we will get the Pollution level in PPM (parts per million). MQ135 gas sensor gives the output in form of voltage levels and we need to convert it into PPM. The sensor was giving us a value of 90 when there was no gas near it as the safe level of air quality is 350 PPM and it should not exceed 1000 ppm. When it exceeds the limit of 1000 PPM, then it starts to cause headache, sleepiness, and stagnant, stale, stuffy air, and if exceeds 2000 PPM then it can cause increased heart rate and many other diseases. When the value will be less than 1000 PPM, then the LCD and webpage will display "Good Quality of Air". Whenever the value will increase 1000 PPM, then the buzzer will start beeping and the LCD and webpage will display "Bad quality of air".

4. Likely Impact(Please attempt to quantify) : Yes

5. Suggested Post Project Activities:

It can be reached out by utilizing ultrasonic sensors and cameras for playing out similar activities without human administrator for estimating the different parameters like soil condition, region secured by the robot and levelling.

6. Budget estimate

A. Recurring (in Rs) :20000

B. Non-Recurring (Equipment/Instrument)(in Rs) :30,000

S. No	Sensor Type	Parameter Measured	Quantity
1	Raspberry pi 3	self-contained System	2
2	MQ2 sensor	Measure gases like LPG, Alcohol, Propane, Hydrogen	2



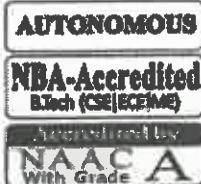
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3	MQ7 sensor	Measure CO concentrations	2
4	Power supply	Power generation	1
5	MCP3008	10-bit Analog-to- Digital Converter	1
6	16GB memory	Memory	1

C. Total (in Rs):50,000

Date: 22-06-2019

Place: Kanchikacherla


Signature of the Principal Investigator



Research and Development Cell

10.07.2019

To

Dr. G. Anantha Lakshmi,
Assistant Professor,
Department of Electronics and Communication Engineering,
Devineni Venkata Ramana & Dr. Hima Sekhar MIC College of Technology,
Kanchikacherla.

Sub: Letter of sanction

Dear **G. Anantha Lakshmi**,

The Management of Devineni Venkata Ramana & Dr. Hima Sekhar MIC College of Technology appreciate your efforts in submitting your proposal titled: "IoT based Air Pollution Monitoring System" seeking a seed grant. After thorough scrutiny, the Research Advisory Committee of the Institution has selected and recommended your proposal for the sanction of Rs 50,000/- to work for a period of one Year.

This seed money grant is provided to enable you to undertake preliminary research work which can result either in a 'proof of concept' or 'proof of experience'. Further, you are expected to apply to external funding agencies (both public and private) to take the outcomes of this project to its intended goal.

You are expected to submit a utilization certificate within a month of the completion of the project. The work done under this project shall be used only for the benefit of the institution and it will not be used or transmitted to anywhere else. The conditions for the conduct of this work will be as per the Seed Grant Policy of the institution.

Wishing you good luck.

Principal

PRINCIPAL

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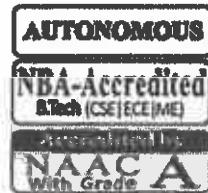
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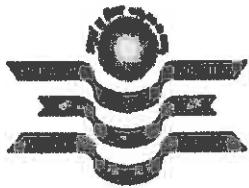
PROJECT COMPLETION REPORT FOR INSTITUTE FUNDED SEED GRANT

- 1) Title of the project: IoT Based Air Pollution Monitoring System
- 2) Name of the Principal Investigator(s) and Co-Investigator(s): Mrs. G. Anantha Lakshmi
- 3) Date of commencement: 10-07-2019
- 4) Proposed date of completion: 28.06.2020
- 5) Actual date of completion: 16.07.2020
- 6) Objectives as stated in the project proposal:

Air pollution affects our day to day activities and quality of life. It poses a threat to the ecosystem and the quality of life on the planet. The dire need to monitor air quality is very glaring, owing to increased industrial activities over the past years. People need to know the extent to which their activities affect air quality. This project proposes an air pollution monitoring system. The system was developed using the Arduino microcontroller. The air pollution monitoring system was designed to monitor and analyze air quality in real-time and log data to a remote server, keeping the data updated over the internet. Air quality measurements were taken based on the Parts per Million (PPM) metrics and analyzed using Microsoft Excel. The air quality measurements taken by the designed system was accurate. The result was displayed on the designed hardware's display interface and could be accessed via the cloud on any smart mobile device.

- 7) Deviation made from original objectives if any, while implementing the project and reasons there of: No
- 8) Details of experimental set up, methods adopted, data collected supported by necessary table, charts, diagrams & photographs:

Experimental set up	Raspberry pi 3 MQ7 sensor MQ2 sensor 16GB memory MCP3008 Power supply
Methodology	In the hardware part we are using Lcd, power supply, Jumper wires, MQ135 air quality sensor, and Node MCU this sensor is used to detect CO2, CO, Ammonia as well as smoke. Followed by Node MCU also called as ESP8266 wifi chip why we are using means we need to push this data to the cloud because Arduino doesn't have wifi capacity so that we use this chip and connect this wifi to our mobile hotspot 5V Power supply is one of the most common power supply in use today. H44780 Character LCD is an industry-standard



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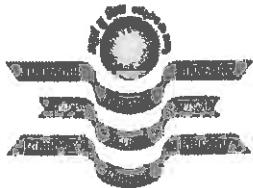
Kanchikacherla - 521180, Krishna Dist, A.P, India.
Phone : 08678 - 273535, 273623, Fax: 08678 - 273569
e-mail: dvthamic@mictech.ac.in, Website: www.mictech.ac.in



	LCD Display device for interfacing with embedded systems. Here we are using 16X2 Configuration 4-bit write mode in this project. We use electromagnet inside the Buzzer In the software part we are using a platform called Things Speak. There is a MATLAB Option also available. we created the Twitter account also for observation of output
Results	ESP8266 Wi-Fi module gives the project access to Wi-Fi or the internet. It is a very cheap device and makes your projects very powerful. It can communicate with any microcontroller and it is the most leading device in the IoT platform. Learn more about here. Then we will connect the MQ135 sensor with the Arduino. Connect the VCC and the ground pin of the sensor to the 5V and ground of the Arduino and the Analog pin of the sensor to the A0 of the Arduino. Connect a buzzer to pin 8 of the Arduino which will start to beep when the condition becomes true. The MQ135 sensor can sense NH ₃ , NO _x , alcohol, Benzene, smoke, CO ₂ , and some other gases, so it is a perfect gas sensor for our Air Quality Monitoring Project. When we will connect it to Arduino then it will sense the gases, and we will get the Pollution level in PPM (parts per million). MQ135 gas sensor gives the output in form of voltage levels and we need to convert it into PPM. The sensor was giving us a value of 90 when there was no gas near it an the safe level of air quality is 350 PPM and it should not exceed 1000 ppm. When it exceeds the limit of 1000 PPM, then it starts to cause headache, sleepiness, and stagnant, stale, stuffy air, and if exceeds 2000 PPM then it can cause increased heart rate and many other diseases. When the value will be less than 1000 PPM, then the LCD and webpage will display "Good Quality of Air". Whenever the value will increase 1000 PPM, then the buzzer will start beeping and the LCD and webpage will display "Bad quality of air".

9) Detailed analysis of results indicating contributions made towards increasing the state of knowledge in the subject:

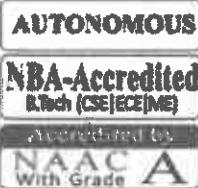
As a result, our project is to check the quality of the exposed level in the air pollution. The mobile application is developed by getting the source and destination address from the user. In this application it monitors the pollutant level through that way. It is also tracks the individual's exposure level of air pollutants for a single day. Our project was designed to help a person to detect, monitor, and test air pollution in a given area. The kit has been integrated with a mobile application that helps the user in predicting the pollution level of their entire route.



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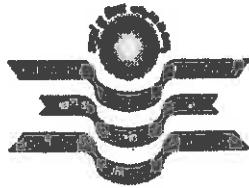
This proposed air pollution monitoring kit along with the integrated mobile application can be helpful to people to identify their exposure level to air pollutants. The app had following features, indices of air quality using real-time computation, air quality daily reports based on users travel distance, specific reports for air quality measures based on locations. Air Pollution is the major affecting factor to our environment. Not only affecting the environment and also affects the human health. The mobile application is developed to monitoring system it tracking the how much the human has exposed in a day. The gas sensors were used for identifying the Leakage Gas, Carbon Monoxide, Smoke, and Propene. The sensor senses the gases and converts from analog to digital and displays in the application. The exposed level is calculated in PPM (Parts per Million).

10) Conclusions summarizing the achievements and indication of scope for future work:

This system is used to send gas like benzene, alcohol, smoke, etc. using the MQ135 Gas Sensor. To monitor the air of the environment using an Arduino microcontroller, IOT Technology is proposed to improve the quality of air. The use of Io technology enhances the process of monitoring various aspects of the environment such as the air quality monitoring issue proposed in this paper. The system this board has a Wi-Fi module that acts as the internet connector and informative access for the air quality. This measures the air quality in real-time using MQ135 Gas Sensor with Node MCU. Node MCU will send the data to things peak platform which is connected with Twitter, so whenever the air quality goes below a certain level it will send the Twitter notification, thus warning people in that particular area. Here the use of the MQ135 gas sensor gives the sense of the different types of dangerous gas and Arduino is the heart of this project which controls the entire process. Wi-Fi module connects the whole process to the internet and LCD is used for the visual Output It supports the new technology and effectively supports the healthy life concept. This system has features for people to monitor the amount of pollution on their mobile phones using the application.

11) Budget utilization:

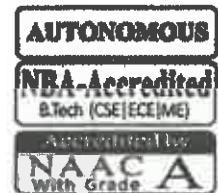
Sr.	Budget Head	Funds Sanctioned	Expenditure	% of Total cost
1.	Recurring (in Rs) :	20000	Stationeries – 5000 Food & Refreshments – 5000 Connectivity - 5000 Travel Expenditure – 5000	40
2.	Non-Recurring (Equipment/Instrument) (in Rs)	30000	1. Raspberry pi 3 2. MQ7 sensor 3. MQ2 sensor 4. 16GB memory 5. MCP3008 Power supply	60
3.	Others, if any	Nil	Nil	Nil



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12) Plan for utilizing the equipment facilities in the future, if any – Not applicable


Signature of the Principal Investigator

Date: 16.07.2020

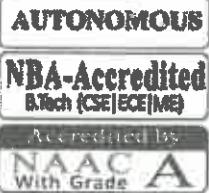
Place: Kanchikacherla



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UTILIZATION CERTIFICATE

Certified that out of Rs 50,000 of institute funded seed grant for the "IoT based Air Pollution Monitoring System" sanctioned during the Academic Year2019-20 in favour of Mrs. G. Anantha Lakshmi from Department of Electronics and Communication Engineering dated 10.7.2019 and a sum of Rs. 50,000 (Rupees Fifty Thousand only) has been utilized for the purpose for which it was sanctioned. The balance amount if any is refunded to the institution.

Signature of PI

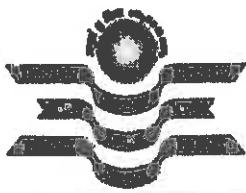
Signature of Accounts Officer

Signature of Head of the Institution

Devineni Venkata Ramana & Dr. Hima Sekhar
MIC College of Technology
KANCHIKACHERLA - 521 180.

PRINCIPAL

Devineni Venkata Ramana & Dr. Hima Sekhar
MIC College of Technology
Kanchikacherla, Krishna District



Devineni Venkata Ramana & Dr.Hima Sekhar
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B.Tech (CSE|ECE|ME)

Accredited by
NAAC **With Grade A**

FORMAT FOR INSTITUTE FUNDED SEED GRANT PROPOSAL

Name of the Principal Investigator: G. Kiran Kumar

Designation: Assistant Professor

Name of the Co-Investigator (if any): Nil

Designation: Nil

Department: Electronics and Communication Engineering

Title of the Project: TEMPERATURE BASED FAN SPEED CONTROLLER using IoT

1. Background

1.1 Description of problem

With the advancement in technology, intelligent systems are introduced every day. Everything is getting more sophisticated and intelligible. There is an increase in the demand of cutting edge technology and smart electronic systems. Micro-controllers play a very important role in the development of the smart systems as brain is given to the system. Today, micro-controllers are used in many disciplines of life for carrying out automated tasks in a more accurate manner. Electric fan is one of the most well-known electrical device because of its cost effectiveness and low power consumption advantages. Fan can be turned on and off physically by using switch button. Where right now, change in the temperature won't give any adjustment in the fan speed. So, an automatic temperature control system technology is necessary for the controlling speed of fan according to the temperature changes.

1.2 Rational for taking up the project:

The idea behind the project is to control the speed of the fan by difference in temperature. The Temperature variation in the fan is a different way to deal with the speed of the motor. It is a process in which the objects temperature is measured and the way of heat energy passes into or out of the object is correctly adjusted to achieve a stable temperature. This project attendances the design and simulation of the fan speed control system by using PWM technique based on the room temperature. How the room temperature can be measured? The answer to the simple question is with the help of a Temperature Sensor. It has been used to measure the temperature of the room and the speed of the fan is varied according to the room temperature using Pulse Width



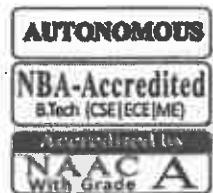
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Modulation technique.

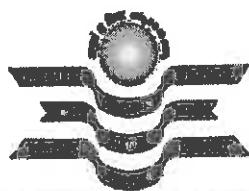
1.3 Description of Proposal

1.3.1 Objectives of the project

In the electronics world we want to make the human life comfortable. Therefore the home automation system is very essential. Fan speed controller is one of the parts of the home automation system. The main objective of this project is to develop an low cost, user friendly automated temperature-controlled fan regulator which reduces power consumption and also assist physically challenged or older peoples so, they can able to control the speed of fan from their locations.

1.4 Innovative component of the project

Arduino UNO is a development board which contains microcontroller in the board itself. It is open-source software. In the electronics platform, Arduino is easy to use hardware and software. The Arduino boards can read inputs so that they can understand and give as some of the outcomes like light on a sensor, a finger on a button, activating a motor, turning on an LED, publishing something manually in online etc., that are all given as output to us. The most of the applications on everyday life, Arduino is a part of the application. The reason is that the Arduino follows the instruction correctly that fed by us. How can we send the instructions to the Arduino board? The instructions can be fed to the Arduino board by these tools, one is the Arduino programming language (based on Wiring), and the other one is Arduino Software (IDE), based on Processing. For a long period of time Arduino has been the master brain for thousands of projects, from everyday objects to complicated scientific instruments. All kind of people around the worldwide like students, hobbyists, artists, programmers, and professionals can make use of this open-source software platform, so that it can be very helpful to the users. The Arduino UNO was founded by the Ivrea Interaction Design Institute as an easy tool with easy access for fast prototyping, targeted at students without a background in electronics and programming. Quickly it interacts the wider community, the Arduino UNO board started facing to adapt to new needs and difficulties as per the product. All the Arduino boards are full and fully open-source platform helps the users to build them freely and clearly adapt them to their particular needs. The software is very easy to access for all kind of users includes the beginners and the new learners, also



flexible enough for advanced users. This software is applicable to all systems like Mac, Windows, and Linux. In the educational area the teachers and the students independently access this software. This paves the way to the technology development and new innovations. Other microcontrollers offer similar functionality. All of these things are taken the sufficient details of microcontroller programming and pack it up in a proper function for the use. Arduino UNO makes the working process simple with the microcontroller

in expensive – The Arduino UNO board is comparatively low cost when compared to the other microcontrollers that available in the market.

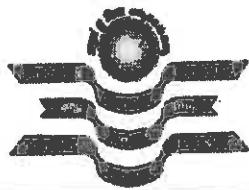
Cross-platform - The Arduino UNO Software (IDE) easily access all kind of the platforms like Windows, Macintosh OSX, and Linux operating systems. Most of the microcontrollers systems are limited to Windows.

Simple programming platform – The Arduino Software (IDE) is very easy and simple for the beginners, available also for the advanced users to take advantage of as well. Also for the teaching staffs it is applicable to teach the students for the basic programming here.

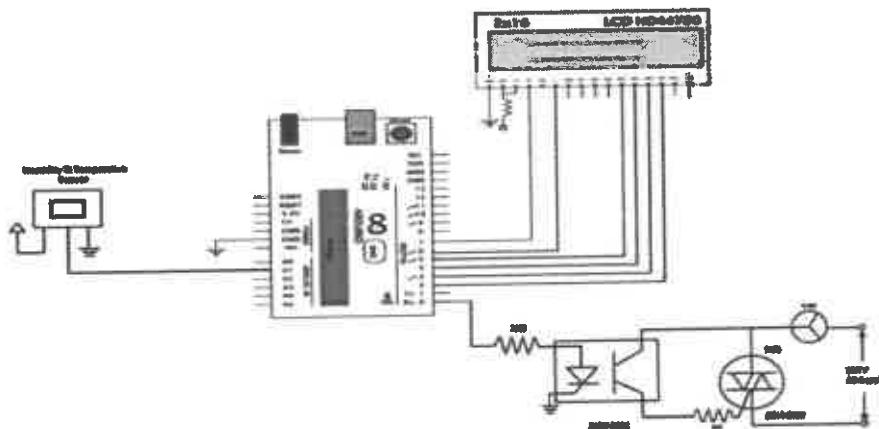
Open source and extensible software - The Arduino IDE software is typographer as open source tools, available for experienced programmers. This can access the c++ libraries in the IDE software itself.

1.5 Methodology detailing stepwise activities and sub-activities

Temperature Based Fan Speed Control & Monitoring With Arduino and LM35 Temperature Sensor. The microcontroller controls the speed of an electric fan according to the requirement & allows dynamic and faster control and the LCD makes the system user-friendly. Sensed temperature in Celsius Scale and fan speed in percentage are simultaneously displayed on the LCD panel. The project is very compact and uses a few components only. The project will help to save energy/electricity. It can be implemented for several applications including air-conditioners, water heaters, snow-meters, ovens, heat-exchangers, mixers, furnaces, incubators, thermal baths and veterinary operating tables. Circuit diagram of the temperature based fan speed control and monitoring is shown in Fig. 1. It is built around Arduino Uno board (Board1), 16x2



LCD (LCD1), temperature sensor LM35 (IC1) and few other components. Arduino is at the heart of this circuit as it controls all the functions. The temperature sensor is interfaced with Arduino to fetch the data of temperature in the room. The data is processed if the temperature is high fan speed is more relatively if the temperature is low fan speed is low. Moreover, if the temperature is below the threshold set then fan will be in off condition. The data related to temperature; fan speed is displayed on the LCD for user interaction. The fan speed is controlled relatively with the temperature using PWM pins available on the Arduino.



2: Work Plan

Phase-wise plan of action up to post project activities detailing time schedule.

Time	1-3 Months	4-6 Months	7-9 Months	10-12 Months
Activity	Literature survey	Problem identification & Framing research	Project Implementation & Finding	Preparing project report & Paper Communication

3. Expected Outcome and Deliverables of the Project

Temperature sensor DHT11 Temperature and Humidity sensor senses the temperature and converts it into an electrical (analog) signal, which is applied to the ATMega328 microcontroller of the Arduino UNO Board. The analog value is converted into a digital value. Thus the sensed values of the temperature and speed of the fan are displayed on the LCD. When the temperature exceeds 30°C the fan starts rotating. A low-frequency pulse-width



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With Grade A

modulation (PWM) signal, whose duty cycle is varied to adjust the fan's speed is used. An inexpensive, single, small pass transistor can be used here. It is efficient because the pass transistor is used as a switch

4. Likely Impact(Please attempt to quantify) : Yes

5. Suggested Post Project Activities:

This project can be used in both the home and Industry. It helps in saving the energy and electricity.

6. Budget estimate

A. Recurring (in Rs) :25000

B. Non-Recurring (Equipment/Instrument)(in Rs) :20,000

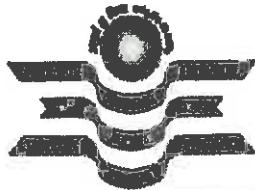
S. No	Sensor Type	Parameter Measured	Quantity
1	Arduino UNO	Microcontroller board based on the ATmega328P	2
2	Temperature Sensor	Temperature to electronic data	2
3	Fan & LCD Display	Flow the air and display unit	1
4	Potentiometer	Measure electromotive force of the given battery	1
5	Transistor & Resistor	Electronic components	4
6	Relay	Switch which control ON/OFF	1

C. Total (in Rs): 45,000

Date: 21-06-2019

Place: Kanchikacherla

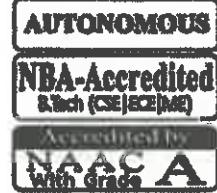

Signature of the Principal Investigator



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Research and Development Cell

10.07.2019

To

Mr. G. Kiran Kumar,
Assistant Professor,
Department of Electronics and Communication Engineering,
Devineni Venkata Ramana & Dr. Hima Sekhar MIC College of Technology,
Kanchikacherla.

Sub: Letter of sanction

Dear G. Kiran Kumar,

The Management of Devineni Venkata Ramana & Dr. Hima Sekhar MIC College of Technology appreciate your efforts in submitting your proposal titled: "Temperature based Fan Speed Controller Using IoT" seeking a seed grant. After thorough scrutiny, the Research Advisory Committee of the Institution has selected and recommended your proposal for the sanction of Rs 45,000/- to work for a period of one Year.

This seed money grant is provided to enable you to undertake preliminary research work which can result either in a 'proof of concept' or 'proof of experience'. Further, you are expected to apply to external funding agencies (both public and private) to take the outcomes of this project to its intended goal.

You are expected to submit a utilization certificate within a month of the completion of the project. The work done under this project shall be used only for the benefit of the institution and it will not be used or transmitted to anywhere else. The conditions for the conduct of this work will be as per the Seed Grant Policy of the institution.

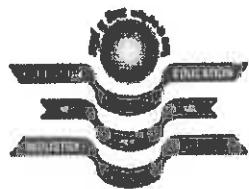
Wishing you good luck.

Principal
PRINCIPAL

Devineni Venkata Ramana & Dr. Hima Sekhar
MIC College of Technology
Kanchikacherla, Krishna District

Copy to:

- HOD, Department of ECE, MIC
- Account Section, MIC



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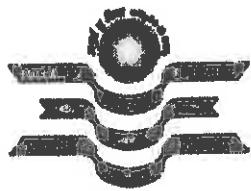
PROJECT COMPLETION REPORT FOR INSTITUTE FUNDED SEED GRANT

- 1) Title of the project: TEMPERATURE BASED FAN SPEED CONTROLLER using IoT
- 2) Name of the Principal Investigator(s) and Co-Investigator(s): G. Kiran Kumar
- 3) Date of commencement: 10-07-2019
- 4) Proposed date of completion: 22.06.2020
- 5) Actual date of completion: 12.07.2020
- 6) Objectives as stated in the project proposal:

In the electronics world we want to make the human life comfortable. Therefore the home automation system is very essential. Fan speed controller is one of the parts of the home automation system. The main objective of this project is to develop an low cost, user friendly automated temperature-controlled fan regulator which reduces power consumption and also assist physically challenged or older peoples so, they can able to control the speed of fan from their locations.

- 7) Deviation made from original objectives if any, while implementing the project and reasons there of: No
- 8) Details of experimental set up, methods adopted, data collected supported by necessary table, charts, diagrams & photographs:

Experimental set up	<ol style="list-style-type: none">1. Microcontroller- ATmega3282. Operating Voltage- 5V Input Voltage3. Input Voltage – 6 to 20V4. Digital I/O Pins- 145. Analog Input Pins :66. DC Current for the 3.3V Pin- 50 mA7. Flash Memory- 32 KB SRAM :2 KB8. EEPROM- 1 KB9. Clock Speed- 16 MHz
Methodology	Temperature Based Fan Speed Control & Monitoring With Arduino and LM35 Temperature Sensor. The microcontroller controls the speed of an electric fan according to the requirement & allows dynamic and faster control and the LCD makes the system user-friendly. Sensed temperature in Celsius Scale and fan speed in percentage are simultaneously displayed on the LCD panel. The project is very compact and uses a few components only. The project will help to save energy/electricity. It can be implemented for several applications including air-conditioners, water heaters, snow-meters, ovens, heat-exchangers, mixers, furnaces, incubators, thermal baths and veterinary operating tables. Circuit diagram of the temperature based fan speed control and monitoring is shown in Fig. 1. It is built around Arduino Uno board (Board1), 16x2 LCD (LCD1), temperature sensor LM35 (IC1) and few other components. Arduino is at the heart of this



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	<p>circuit as it controls all the functions. The temperature sensor is interfaced with Arduino to fetch the data of temperature in the room. The data is processed if the temperature is high fan speed is more relatively if the temperature is low fan speed is low. Moreover, if the temperature is below the threshold set then fan will be in off condition. The data related to temperature; fan speed is displayed on the LCD for user interaction. The fan speed is controlled relatively with the temperature using PWM pins available on the Arduino.</p>
Results	<p>This project can be used in both the home and Industry. It helps in saving the energy and electricity.</p> <ul style="list-style-type: none">➤ To watch the environments that is not comfortable, or possible, for humans to monitor, especially for extended periods of time.➤ Prevents waste of energy when it's not hot enough for a fan to be needed. To assist people who are disabled to adjust the fan speed automatically.➤ In future case we can monitor more parameters like humidity, light and at the same time control them and also can send this data to a remote location using mobile or internet.➤ Using this technology we can able to draw graphs of variations in these parameters using computer. And the temperature exceeds the limit; a call will be dialed to the respective given number by an automatic Dialer system.

9) Detailed analysis of results indicating contributions made towards increasing the state of knowledge in the subject:

The working of this project is the temperature sensor LM35 senses the temperature and converts it into an electrical (analog) signal, which is applied to the ATmega328 microcontroller of the Arduino UNO Board. In this the Arduino UNO board converts the recorded signal from analog to digital signal. So that the recorded values of the temperature and speed of the fan are displayed on the LCD. When the temperature crosses 30°C the fan starts rotating. A low-frequency pulse-width modulation (PWM) signal, whose duty cycle is varied to adjust the fan's speed, is used. An inexpensive, single, small pass transistor-like 2N222 or BD139 can be used here. It is efficient because the pass transistor is used as a switch

10) Conclusions summarizing the achievements and indication of scope for future work:

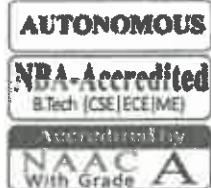
This project can be used in both the home and Industry. It helps in saving the energy and electricity. To watch the environments that is not comfortable, or possible, for humans to monitor, especially for extended periods of time. To Prevents waste of energy when it's not hot enough for a fan to be needed. To assist people who are disabled to adjust the fan speed automatically.



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11) Budget utilization:

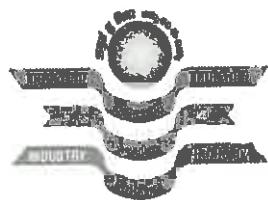
Sr.	Budget Head	Funds Sanctioned	Expenditure	% of Total cost
1.	Recurring (in Rs) :	25000	Stationeries – 8000 Food & Refreshments – 5000 Connectivity - 5000 Travel Expenditure – 7000	55.56
2.	Non-Recurring (Equipment/Instrument) (in Rs)	20000	1. Microcontroller- ATmega328 2. Operating Voltage- 5V Input Voltage 3. Input Voltage – 6 to 20V 4. Digital I/O Pins- 14 Analog Input Pins :6 5. DC Current for the 3.3V Pin- 50 mA 6. Flash Memory- 32 KB SRAM :2 KB 7. EEPROM- 1 KB Clock Speed- 16 MHz	44.44
3.	Others, if any	Nil	Nil	Nil

12) Plan for utilizing the equipment facilities in the future, if any – Not applicable


Signature of the Principal Investigator

Date: 12.07.2020

Place: Kanchikacherla



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With Grade **A**

UTILIZATION CERTIFICATE

Certified that out of Rs 45,000 of institute funded seed grant for the "Temperature based Fan Speed Controller Using IoT" sanctioned during the Academic Year 2019-20 in favour of Mr. G. Kiran Kumar from Department of Electronics and Communication Engineering dated 10.7.2019 and a sum of Rs. 45,000 (Rupees Forty-Five Thousand only) has been utilized for the purpose for which it was sanctioned. The balance amount if any is refunded to the institution.

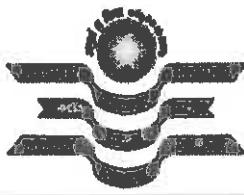
Signature of PI

Signature of Accounts Officer

Signature of Head of the Institution

Devineni Venkata Ramana & Dr. Hima Sekhar
MIC College of Technology
KANCHIKACHERLA - 521 180.

PRINCIPAL
Devineni Venkata Ramana & Dr Hima Sekhar
MIC College of Technology,
Kanchikacherla, Krishna District



FORMAT FOR INSTITUTE FUNDED SEED GRANT PROPOSAL

Name of the Principal Investigator: D. Prasad

Designation: Associate Professor

Name of the Co-Investigator (if any): Nil

Designation: Nil

Department: Computer Science Engineering

Title of the Project : Certificateless public integrity checking of group shared data of cloud storage

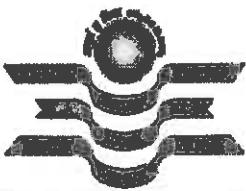
1. Background

1.1 Description of problem

Certificateless public integrity checking of group shared data in cloud storage is a security challenge that arises when multiple users collaborate and store their data in a shared cloud environment. Traditional integrity checking methods rely on digital signatures or certificates, which can be cumbersome to manage in group settings. Certificateless cryptography aims to address this issue by allowing users to verify data integrity without the need for certificates. This problem involves designing cryptographic protocols and algorithms to ensure that data remains tamper-proof and authentic while simplifying the management of authentication credentials in a group cloud storage scenario.

1.2 Rational for taking up the project :

The project of certificateless public integrity checking of group shared data in cloud storage is crucial due to the growing reliance on cloud services for data storage and sharing. Traditional methods rely on certificates, which can be cumbersome and insecure. Certificateless public integrity checking offers a more efficient and secure solution. It ensures data integrity and authenticity in a group setting without the need for certificates, making it practical for various



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applications. This project addresses the pressing need for secure and efficient data management in the cloud, making it highly relevant in today's digital age.

1.3 Description of Proposal

1.3.1 Objectives of the project

The objective of the project is to develop a secure and efficient method for certificateless public integrity checking of group-shared data stored in cloud storage. This aims to ensure that data stored in the cloud remains intact and unaltered while allowing authorized group members to verify the integrity of the shared data without relying on traditional certificates. The project seeks to enhance data security, reduce the risk of unauthorized modifications, and provide a scalable solution for collaborative data storage and verification in cloud environments.

1.4 Innovative component of the project

The innovative component of the project lies in its "Certificateless Public Integrity Checking" mechanism for group-shared data in cloud storage. Unlike traditional methods that require a centralized certificate authority, this approach eliminates the need for certificates, thus reducing overhead and improving scalability. It leverages advanced cryptographic techniques to verify data integrity while allowing multiple users to collaboratively access and check the integrity of shared data without revealing sensitive information. This innovation enhances security and efficiency in cloud storage, making it well-suited for modern, dynamic, and resource-efficient cloud environments.

1.5 Methodology detailing stepwise activities and sub-activities

Certificateless public integrity checking of group shared data in cloud storage involves ensuring data integrity without relying on traditional certificates. Here's a stepwise methodology:

1. Setup and Key Generation

- Generate public parameters.
- Generate group public keys and individual secret keys for users.
- Share public parameters and group public keys.

2. Data Encoding and Sharing

- Encode data and create checksums.



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- Encrypt data using shared public keys.
- Distribute data and checksums to the cloud.

3. Integrity Check Request

- A group member requests integrity check.
- Provide data and checksums to a verifier.

4. Integrity Check at Verifier

- Verifier calculates checksums from received data.
- Verifier verifies data integrity using the calculated checksums and received checksums.
- Verifier communicates the result to the group member.

5. Security and Authentication

- Ensure authentication and security mechanisms to protect against unauthorized access.

6. Revocation and Key Updates :

- Manage key revocation and updates for group members.

7. Logging and Auditing

- Maintain logs for auditing purposes.

8. Maintenance and Scaling

- Continuously maintain the system, adding or removing members as needed.

This methodology ensures group-shared data integrity in a certificateless manner, maintaining security and scalability in cloud storage environments.

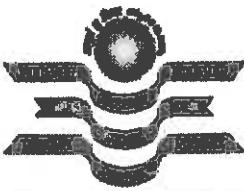
02: Work Plan

Phase-wise plan of action up to post project activities detailing time schedule.

Time	1-2Months	3-4 Months	5-7 Months	8-11 Months
Activity	Literature survey	Problem identification & Framing research design	Project Implementation & Finding	Preparing project report & Paper Communication

3. Expected Outcome and Deliverables of the Project

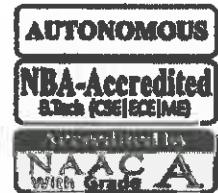
The expected outcome of the project on "Certificateless Public Integrity Checking of Group Shared Data in Cloud Storage" is to develop a secure and efficient system that enables users to verify the integrity of data stored in the cloud without requiring traditional certificates. The project aims to create a novel authentication and integrity checking mechanism that ensures



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data remains unaltered and accessible to authorized group members. Key deliverables include a functional software system with user-friendly interfaces, documentation detailing the system's design and implementation, and a research report highlighting the project's contributions and findings in the field of cloud security and data integrity.

4. Likely Impact(Please attempt to quantify) : Yes

5. Suggested Post Project Activities:

Certificationless public integrity checking of group-shared data in cloud storage involves several key project activities. First, establish a secure communication channel for group members to interact with the cloud storage provider. Develop a cryptographic protocol for data sharing that doesn't rely on certificates, ensuring data integrity and authenticity. Implement a distributed data storage mechanism to facilitate group access while maintaining security. Develop algorithms for efficient integrity checking, such as Merkle trees or homomorphic hashing. Finally, create a user-friendly interface for group members to verify data integrity in the cloud storage environment. Test and validate the solution with different use cases to ensure its effectiveness and security..

6. Budget estimate

A. Recurring (in Rs) :20000

B. Non-Recurring (Equipment / Instrument) (in Rs) :30,000

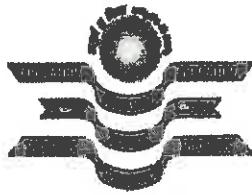
S. No	Type	Parameter Measured	Quantity
1	Computer	Efficiency of Algorithm	2

C. Total (in Rs): 50,000

Date: 30.06.2019

Place: Kanchikacherla


Signature of the Principal Investigator



Research and Development Cell

10.07.2019

To

Mr. D. Prasad,
Associate Professor,
Department of Computer Science and Engineering,
Devineni Venkata Ramana & Dr. Hima Sekhar MIC College of Technology,
Kanchikacherla.

Sub: Letter of sanction

Dear D Prasad,

The Management of Devineni Venkata Ramana & Dr. Hima Sekhar MIC College of Technology appreciate your efforts in submitting your proposal titled: "Certificateless Public Integrity Checking of Group Shared Data of Cloud Storage" seeking a seed grant. After thorough scrutiny, the Research Advisory Committee of the Institution has selected and recommended your proposal for the sanction of Rs 50,000/- to work for a period of one Year.

This seed money grant is provided to enable you to undertake preliminary research work which can result either in a 'proof of concept' or 'proof of experience'. Further, you are expected to apply to external funding agencies (both public and private) to take the outcomes of this project to its intended goal.

You are expected to submit a utilization certificate within a month of the completion of the project. The work done under this project shall be used only for the benefit of the institution and it will not be used or transmitted to anywhere else. The conditions for the conduct of this work will be as per the Seed Grant Policy of the institution.

Wishing you good luck.

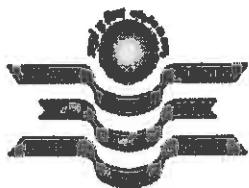
Principal

PRINCIPAL

Devineni Venkata Ramana & Dr Hima Sekhar
MIC College of Technology
Kanchikacherla, Krishna District

Copy to:

- HOD, Department of CSE, MIC
- Account Section, MIC



Devineni Venkata Ramana & Dr.Hima Sekhar
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PROJECT COMPLETION REPORT FOR INSTITUTE FUNDED SEED GRANT

- 1) Title of the project: Hyperparameter tuning of graph convolution networks based collaborative recommender systems
- 2) Name of the Principal Investigator(s) and Co-Investigator(s): D Prasad
- 3) Date of commencement: 10.07.2019
- 4) Proposed date of completion: 30.06.2020
- 5) Actual date of completion: 20.06.2020
- 6) Objectives as stated in the project proposal:

The objective of the project is to develop a secure and efficient method for certificateless public integrity checking of group-shared data stored in cloud storage. This aims to ensure that data stored in the cloud remains intact and unaltered while allowing authorized group members to verify the integrity of the shared data without relying on traditional certificates. The project seeks to enhance data security, reduce the risk of unauthorized modifications, and provide a scalable solution for collaborative data storage and verification in cloud environments.

- 7) Deviation made from original objectives if any, while implementing the project and reasons thereof: No
- 8) Details of experimental set up, methods adopted, data collected supported by necessary table, charts, diagrams & photographs:

Experimental set up	1. Computer
Methodology	Certificateless public integrity checking of group-shared data in cloud storage is a security mechanism that enables users to verify the integrity of their stored data without requiring a certificate authority. In this methodology, data is divided into groups, and each group has a designated group leader. The data owner generates integrity metadata and shares it with the group leader, who further distributes it among group members. To check data integrity, users can compare their local data with the metadata received from the group leader. This approach ensures data integrity in a distributed and collaborative cloud storage environment while avoiding the complexities of traditional certificate-based methods.



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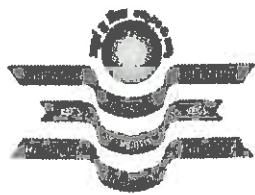


Results	Certificateless public integrity checking of group shared data in cloud storage is a robust security mechanism that ensures the data's integrity without the need for traditional digital certificates. This approach offers several advantages, including enhanced scalability and reduced overhead compared to traditional certificate-based methods. By utilizing certificateless cryptography, users can collectively verify the integrity of their shared data in a cloud environment. This strengthens trust among group members, as they can independently verify data integrity without relying on a centralized certificate authority. This innovation plays a crucial role in securing data in collaborative cloud storage scenarios, assuring users that their shared information remains intact and trustworthy.
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- 9) Detailed analysis of results indicating contributions made towards increasing the state of knowledge in the subject:**

The study on "Certificateless Public Integrity Checking of Group Shared Data in Cloud Storage" has significantly advanced our understanding of data integrity and security in cloud-based group sharing scenarios. By proposing a certificateless approach, the research addresses the limitations of traditional certificate-based systems, reducing overhead and complexity. The results demonstrate improved efficiency and security, which is vital for ensuring the trustworthiness of data stored in the cloud. This research contributes to the state of knowledge in cloud security by providing a practical and scalable solution for group data integrity verification, enhancing the overall reliability and confidentiality of cloud storage systems.

- 10) Conclusions summarizing the achievements and indication of scope for future work:**
In conclusion, the implementation of certificateless public integrity checking for group-shared data in cloud storage has demonstrated significant advancements in enhancing the security and trustworthiness of cloud-based data sharing. By eliminating the need for certificates, this approach reduces complexity and enhances efficiency. However, there is still room for further research and development. Future work can focus on refining the scalability of the system, exploring more robust cryptographic techniques, and addressing potential vulnerabilities to ensure the continued integrity and confidentiality of data in cloud storage, thereby providing a more comprehensive solution for secure data sharing in the cloud.



11) Budget utilization:

Sr.	Budget Head	Funds Sanctioned	Expenditure	% of Total cost
1.	Recurring (in Rs)	20000	Stationaries – 8000 Food & Refreshments – 2000 Connectivity - 5000 Travel Expenditure – 5000	40
2.	Non-Recurring (Equipment / Instrument) (in Rs)	30000	Desktop	60
3.	Others, if any	Nil	Nil	Nil

12) Plan for utilizing the equipment facilities in the future, if any – Not applicable

Signature of the Principal Investigator

Date: 20.06.2020

Place: Kanchikacherla



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Accredited by
NAAC **A**
With Grade

UTILIZATION CERTIFICATE

Certified that out of Rs 50.000 of institute funded seed grant for the "Certificateless public integrity checking of group shared data of cloud storage" sanctioned during the Academic Year 2019-20 in favour of D.Prasad from Department of Computer Science and Engineering dated 10.07.2019 and a sum of Rs. 50,000 (Rupees Fifty Thousand only) has been utilized for the purpose for which it was sanctioned. The balance amount if any is refunded to the institution.

Signature of PI

Signature of Accounts Officer

Signature of Head of the Institution

Devineni Venkata Ramana & Dr. Hima Sekhar
MIC College of Technology
KANCHIKACHERLA - 521 180.

PRINCIPAL

Devineni Venkata Ramana & Dr. Hima Sekhar
MIC College of Technology
Kanchikacherla, Krishna District



FORMAT FOR INSTITUTE FUNDED SEED GRANT PROPOSAL

Name of the Principal Investigator: V. Srilakshmi

Designation: Assistant Professor

Name of the Co-Investigator (if any): Nil

Designation: Nil

Department: Computer Science and Engineering

Title of the Project : Trust assesment in online social networks

1. Background

1.1 Description of problem

Trust assessment in online social networks is a critical challenge. In these platforms, users interact with others they may not know personally, making it crucial to evaluate the reliability and credibility of connections, content, and information. Fake profiles, misinformation, and malicious behavior can undermine trust. Detecting and quantifying trustworthiness involves analyzing user behavior, content quality, network structure, and other factors. Accurate trust assessment can enhance online safety, information credibility, and the overall user experience, contributing to healthier and more trustworthy digital communities.

1.2 Rational for taking up the project :

The assessment of trust in online social networks is critical due to the pervasive use of these platforms in our daily lives. In an era of digital interactions, understanding trust is essential for ensuring cybersecurity, protecting users from scams, and fostering healthy online communities. This project aims to enhance our comprehension of trust dynamics in online environments, ultimately contributing to the development of more secure, reliable, and trustworthy digital spaces.

1.3 Description of Proposal

1.3.1 Objectives of the project

The objective of a trust assessment project in online social networks is to develop a framework or system that can evaluate and quantify the trustworthiness of users and content within the online social network. This involves analyzing user behavior, interactions, and content quality to identify reliable sources of information and distinguish them from potentially



untrustworthy or malicious entities. The project aims to enhance online safety, mitigate misinformation, and improve the overall user experience by providing users with valuable insights into the credibility of their network connections and shared content.

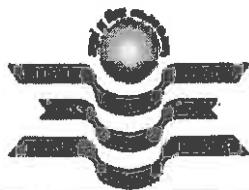
1.4 Innovative component of the project

An innovative component of a trust assessment project in online social networks could be the incorporation of advanced machine learning and natural language processing techniques to analyze not only user behaviors but also the content of interactions. This approach would consider factors such as sentiment analysis, topic modeling, and deep learning models to detect nuanced patterns of trust and distrust within user-generated content. By going beyond traditional metrics and incorporating textual data analysis, this innovative approach can provide a more comprehensive and accurate understanding of trust dynamics in online social networks, enhancing user safety and experience.

1.5 Methodology detailing stepwise activities and sub-activities

Trust assessment in online social networks involves several steps:

1. **Data Collection** : Gather user-generated content, network connections, and user profiles from the online social network.
2. **Feature Extraction** : Extract relevant features, such as user interactions, content sentiment, and network centrality metrics.
3. **Labeling** : Define trust labels, typically binary (trusted/untrusted) or continuous scores based on historical user behavior or expert judgment.
4. **Data Preprocessing** : Clean and preprocess data by handling missing values, outliers, and normalizing features.
5. **Model Selection** : Choose an appropriate trust assessment model, such as Bayesian models, machine learning classifiers, or reputation systems.
6. **Training and Testing** : Split data into training and testing sets, and train the trust model on labeled data.
7. **Feature Engineering** : Experiment with feature selection and engineering to improve model accuracy.



8. Model Evaluation : Assess model performance using metrics like accuracy, precision, recall, and F1-score.
9. Feedback Loop : Continuously update the model with new data to adapt to changing user behaviors and network dynamics.
10. Interpretation : Analyze trust assessment results to make informed decisions, such as user recommendations or content filtering, in online social networks.

02: Work Plan

Phase-wise plan of action up to post project activities detailing time schedule.

Time	1-3 Months	4-6 Months	7-9 Months	10-12 Months
Activity	Literature survey	Problem identification & Framing research design	Project Implementation & Finding	Preparing project report & Paper Communication

3. Expected Outcome and Deliverables of the Project

The expected outcome of a project focused on trust assessment in online social networks is to develop a robust methodology or algorithm for evaluating trustworthiness among network users. This methodology should include metrics and techniques for assessing trust levels based on user behavior, interactions, and content shared within the network. The project's deliverables would include a trust assessment model, a software tool or platform for implementing and testing the model, and research findings that provide insights into trust dynamics within online social networks. Additionally, the project may yield recommendations for enhancing user trust and safety within these platforms, ultimately contributing to a safer and more secure online social environment.

4. Likely Impact(Please attempt to quantify) : Yes

5. Suggested Post Project Activities:Nil



6. Budget estimate

A. Recurring (in Rs) :15000

B. Non-Recurring (Equipment / Instrument) (in Rs) :30,000

S. No	Type	type	Quantity
1	Computer	Desktop	1

C. Total (in Rs): 45,000

Date: 20.06.2019
Place: Kanchikacherla

Signature of the Principal Investigator



Devineni Venkata Ramana & Dr.Hima Sekhar
MIC College of Technology

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Research and Development Cell

10.07.2019

To

Ms. V. Srilakshmi,
Assistant Professor,
Department of Computer Science and Engineering,
Devineni Venkata Ramana & Dr. Hima Sekhar MIC College of Technology,
Kanchikacherla.

Sub: Letter of sanction

Dear V. Srilakshmi,

The Management of Devineni Venkata Ramana & Dr. Hima Sekhar MIC College of Technology appreciate your efforts in submitting your proposal titled: "Trust Assessment in Online Social Networks" seeking a seed grant. After thorough scrutiny, the Research Advisory Committee of the Institution has selected and recommended your proposal for the sanction of Rs 45,000/- to work for a period of one Year.

This seed money grant is provided to enable you to undertake preliminary research work which can result either in a 'proof of concept' or 'proof of experience'. Further, you are expected to apply to external funding agencies (both public and private) to take the outcomes of this project to its intended goal.

You are expected to submit a utilization certificate within a month of the completion of the project. The work done under this project shall be used only for the benefit of the institution and it will not be used or transmitted to anywhere else. The conditions for the conduct of this work will be as per the Seed Grant Policy of the institution.

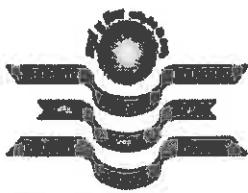
Wishing you good luck.

Principal
PRINCIPAL

Devineni Venkata Ramana & Dr. Hima Sekhar
MIC College of Technology
Kanchikacherla, Krishna District'

Copy to:

- HOD, Department of CSE, MIC
- Account Section, MIC



Devineni Venkata Ramana & Dr.Hima Sekhar
MIC College of Technology

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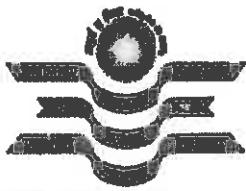
PROJECT COMPLETION REPORT FOR INSTITUTE FUNDED SEED GRANT

- 1) Title of the project: Trust assesment in online social networks
- 2) Name of the Principal Investigator(s) and Co-Investigator(s): Mrs. V. Srilakshmi
- 3) Date of commencement: 10.07.2019
- 4) Proposed date of completion: 20.06.2020
- 5) Actual date of completion: 15.06.2020
- 6) Objectives as stated in the project proposal:

The objective of a trust assessment project in online social networks is to develop a framework or system that can evaluate and quantify the trustworthiness of users and content within the online social network. This involves analyzing user behavior, interactions, and content quality to identify reliable sources of information and distinguish them from potentially untrustworthy or malicious entities. The project aims to enhance online safety, mitigate misinformation, and improve the overall user experience by providing users with valuable insights into the credibility of their network connections and shared content.

- 7) Deviation made from original objectives if any, while implementing the project and reasons thereof: No
- 8) Details of experimental set up, methods adopted, data collected supported by necessary table, charts, diagrams & photographs:

Experimental set up	1. Computer
Methodology	Assessing trust in online social networks involves several steps. Initially, data is collected from users' interactions and profiles. Features such as user activity, post content, and network connections are extracted. Then, trust metrics are formulated, considering factors like user reputation, engagement, and consistency. Machine learning models, such as logistic regression or neural networks, are trained on labeled trust data to predict trustworthiness. Validation is performed using cross-validation or hold-out sets. Finally, trust scores are generated for users, enabling the network to identify trustworthy connections and content, which is crucial for enhancing online safety and content quality.
Results	Assessing trust in online social networks is a complex task. Results



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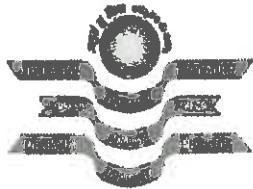
may involve evaluating factors like user interactions, content credibility, and network connections. Advanced techniques such as trust-based algorithms, sentiment analysis, and user behavior analysis can help determine trustworthiness. These assessments aid in identifying reliable sources, mitigating misinformation, and enhancing user experiences within the online social network environment. Ultimately, the results contribute to a safer and more trustworthy online community.

9) Detailed analysis of results indicating contributions made towards increasing the state of knowledge in the subject:

Trust assessment in online social networks is a crucial research area that has contributed significantly to our understanding of how trust operates in the digital realm. Detailed analyses of results in this field have revealed various factors affecting trust, such as user behavior, network structure, and information credibility. Researchers have developed models and algorithms to quantify and predict trust levels, aiding in the creation of more reliable online platforms. Moreover, this research has led to the development of tools and strategies to combat issues like misinformation and fraud, ultimately enhancing the safety and reliability of online interactions. Overall, the body of work in trust assessment within online social networks has greatly advanced our knowledge and the practical application of trust-related concepts in the digital age.

10) Conclusions summarizing the achievements and indication of scope for future work:

In assessing trust within online social networks, several accomplishments have been made, including the development of trust models and algorithms, as well as the identification of trustworthiness indicators. However, challenges persist, such as the dynamic nature of social interactions and evolving trust dynamics. Future work should focus on enhancing the scalability, adaptability, and robustness of trust assessment methods to address these challenges. Additionally, exploring the integration of machine learning and deep learning techniques for real-time trust evaluation and considering the ethical implications of trust assessment in online social networks will be critical areas for future research.



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11. Budget utilization:

Sr.	Budget Head	Funds Sanctioned	Expenditure	Total cost
1.	Recurring (in Rs) :	15000	Stationaries – 8000 Food & Refreshments – 2000 Connectivity - 2000 Travel Expenditure – 3000	33.33
2.	Non-Recurring (Equipment / Instrument) (in Rs)	30000	Computer	66.67
3.	Others, if any	Nil	Nil	Nil

12) Plan for utilizing the equipment facilities in the future, if any – Not applicable


Signature of the Principal Investigator

Date: 15.06.2020

Place: Kanchikacherla



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B.Tech (CSE|ECE|ME)

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With Grade A

UTILIZATION CERTIFICATE

Certified that out of Rs 45,000 of institute funded seed grant for the "Trust assessment in online social networks" sanctioned during the Academic Year 2019-20 in favour of V. Srilakshmi from Department of Computer Science and Engineering dated 10.07.2019 and a sum of Rs. 45,000 (Rupees Forty-Five Thousand only) has been utilized for the purpose for which it was sanctioned. The balance amount if any is refunded to the institution.

Signature of PI

Signature of Accounts Officer

Signature of Head of the Institution :-

PRINCIPAL

Devineni Venkata Ramana & Dr. Hima Sekhar
MIC College of Technology
KANCHIKACHERLA - 521 180.



FORMAT FOR INSTITUTE FUNDED SEED GRANT PROPOSAL

Name of the Principal Investigator: V. Lakshmi Chetana

Designation: Assistant Professor

Name of the Co-Investigator (if any): Nil

Designation: Nil

Department: Computer Science and Engineering

Title of the Project : Prediction of price of Bitcoin using Machine Learning

1. Background

1.1 Description of problem

Predicting the price of Bitcoin using machine learning is a challenging problem due to the cryptocurrency's extreme volatility and complex market dynamics. The objective is to develop a model that can analyze historical Bitcoin price data and potentially external factors like market sentiment, trading volumes, and macroeconomic indicators to forecast future price movements. Such predictions can be valuable for investors, traders, and policymakers, but they require robust data, sophisticated feature engineering, and the use of appropriate machine learning algorithms to handle the high-risk nature of cryptocurrency markets.

1.2 Rational for taking up the project :

The prediction of Bitcoin prices using machine learning is an enticing project due to the cryptocurrency's volatility and potential for substantial financial gains or losses. Understanding and forecasting Bitcoin's price movements can provide valuable insights for investors and traders. Additionally, it serves as an opportunity to apply and experiment with various machine learning algorithms, data sources, and feature engineering techniques in a high-impact and rapidly evolving domain. Ultimately, it offers a chance to contribute to the understanding of this emerging asset class and potentially make informed investment decisions.

1.3 Description of Proposal

1.3.1 Objectives of the project

The objective of the project is to develop a machine learning model that can predict the price of Bitcoin accurately. This involves collecting historical Bitcoin price data, engineering relevant features, and training a predictive model. The project aims to leverage machine learning



algorithms to analyze past price trends, trading volumes, and potentially external factors like news sentiment or market indicators to forecast future Bitcoin prices. The ultimate goal is to provide investors and traders with valuable insights for decision-making in the highly volatile cryptocurrency market.

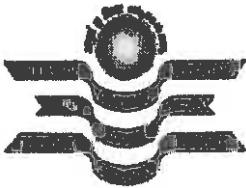
1.4 Innovative component of the project

An innovative component of a project predicting the price of Bitcoin using Machine Learning could be the incorporation of sentiment analysis from social media and news sources. By extracting and analyzing sentiment related to Bitcoin from tweets, news articles, and other online sources, the model can factor in market sentiment as an additional feature. This can provide valuable insights into how public perception and sentiment impact Bitcoin's price movements, enhancing the accuracy of price predictions and helping investors make more informed decisions in this highly volatile market.

1.5 Methodology detailing stepwise activities and sub-activities

Predicting the price of Bitcoin using machine learning involves a structured methodology with several key steps and sub-activities.

1. **Data Collection** : Gather historical Bitcoin price data, including features like trading volume, market sentiment, and technical indicators.
2. **Data Preprocessing** : Clean and preprocess the data, handling missing values and outliers, and convert it into a suitable format for machine learning.
3. **Feature Engineering** : Create relevant features or transformations from the data, such as moving averages or relative strength indicators.
4. **Label Generation** : Define the target variable, which could be the future price of Bitcoin or a binary label indicating whether it will increase or decrease.
5. **Data Splitting** : Divide the dataset into training and testing sets to evaluate model performance.
6. **Model Selection** : Choose an appropriate machine learning algorithm, such as regression, time series models, or deep learning methods like LSTM networks.
7. **Hyperparameter Tuning** : Optimize the model's hyperparameters, like the learning rate



or regularization strength, through cross-validation.

8. Training and Validation : Train the model on the training data and validate its performance on the testing data using metrics like Mean Absolute Error (MAE) or Root Mean Squared Error (RMSE).
9. Evaluation and Backtesting : Assess the model's accuracy and backtest it on historical data to see how well it would have performed.
10. Deployment : If the model performs well, consider deploying it for real-time predictions with continuous updates.
11. Risk Management : Implement risk management strategies, such as stop-loss orders, to mitigate potential losses when using the predictions for trading.
12. Monitoring and Maintenance : Continuously monitor the model's performance, update it with new data, and adapt to changing market conditions.
13. Ethical Considerations : Be aware of ethical and regulatory aspects when using machine learning for financial predictions, and ensure compliance with relevant guidelines.

This methodology provides a structured approach to predict Bitcoin prices using machine learning while emphasizing the importance of data quality, model selection, and risk management in cryptocurrency trading.

02: Work Plan

Phase-wise plan of action up to post project activities detailing time schedule.

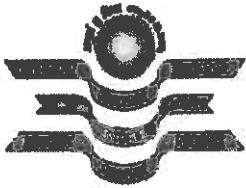
Time	1-3 Month	4-6 Months	7-9 Months	10-12 Months
Activity	Literature survey	Problem identification & Framing research design	Project Implementation & Finding	Preparing project report & Paper Communication

3. Expected Outcome and Deliverables of the Project

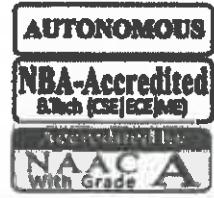
The project aims to predict the price of Bitcoin using machine learning techniques. The expected outcome is a predictive model that can forecast Bitcoin prices with reasonable accuracy, enabling investors and traders to make more informed decisions. The deliverables include a well-trained machine learning model, a user-friendly interface for inputting historical data and obtaining price predictions, and a comprehensive report detailing the model's performance metrics, potential limitations, and recommendations for its practical use in the volatile cryptocurrency market. This project can assist stakeholders in mitigating risks and optimizing their Bitcoin trading strategies.

4. Likely Impact(Please attempt to quantify) : Yes

5. Suggested Post Project Activities:



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6. Budget estimate

A. Recurring (in Rs) :15000

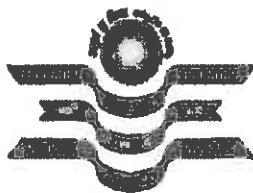
B. Non-Recurring (Equipment / Instrument) (in Rs) :35,000

S. No	Equipment	Parameter Measured	Quantity
1	Computer		1

C. Total (in Rs): 50,000

Date: 18.06.2019
Place: Kanchikacherla

Signature of the Principal Investigator



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Research and Development Cell

10.07.2019

To

Ms. V. Lakshmi Chetana,
Assistant Professor,
Department of Computer Science and Engineering,
Devineni Venkata Ramana & Dr. Hima Sekhar MIC College of Technology,
Kanchikacherla.

Sub: Letter of sanction

Dear V. Lakshmi Chetana,

The Management of Devineni Venkata Ramana & Dr. Hima Sekhar MIC College of Technology appreciate your efforts in submitting your proposal titled: "Prediction of Price of Bitcoin Using Machine Learning" seeking a seed grant. After thorough scrutiny, the Research Advisory Committee of the Institution has selected and recommended your proposal for the sanction of Rs 50,000/- to work for a period of one Year.

This seed money grant is provided to enable you to undertake preliminary research work which can result either in a 'proof of concept' or 'proof of experience'. Further, you are expected to apply to external funding agencies (both public and private) to take the outcomes of this project to its intended goal.

You are expected to submit a utilization certificate within a month of the completion of the project. The work done under this project shall be used only for the benefit of the institution and it will not be used or transmitted to anywhere else. The conditions for the conduct of this work will be as per the Seed Grant Policy of the institution.

Wishing you good luck.

Principal

PRINCIPAL

Devineni Venkata Ramana & Dr. Hima Sekhar
MIC College of Technology
Kanchikacherla, Krishna District

Copy to:

- HOD, Department of CSE, MIC
- Account Section, MIC



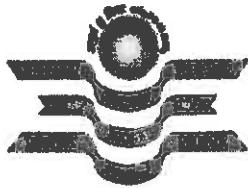
PROJECT COMPLETION REPORT FOR INSTITUTE FUNDED SEED GRANT

- 1) Title of the project: Prediction of price of Bitcoin using Machine Learning
- 2) Name of the Principal Investigator(s) and Co-Investigator(s): V. Lakshmi Chetana
- 3) Date of commencement: 10.07.2019
- 4) Proposed date of completion: 18.06.2020
- 5) Actual date of completion: 11.06.2020
- 6) Objectives as stated in the project proposal:

Predicting the price of Bitcoin using machine learning is a challenging problem due to the cryptocurrency's extreme volatility and complex market dynamics. The objective is to develop a model that can analyze historical Bitcoin price data and potentially external factors like market sentiment, trading volumes, and macroeconomic indicators to forecast future price movements. Such predictions can be valuable for investors, traders, and policymakers, but they require robust data, sophisticated feature engineering, and the use of appropriate machine learning algorithms to handle the high-risk nature of cryptocurrency markets.

- 7) Deviation made from original objectives if any, while implementing the project and reasons thereof: No
- 8) Details of experimental set up, methods adopted, data collected supported by necessary table, charts, diagrams & photographs:

Experimental set up	1. Computer
Methodology	<p>Predicting the price of Bitcoin using Machine Learning involves several key steps. First, gather historical Bitcoin price and relevant data (e.g., trading volume, sentiment analysis). Next, preprocess the data, handling missing values and scaling features. Choose a suitable ML algorithm, such as a time series model like ARIMA or a deep learning model like LSTM, and split the data into training and testing sets. Train the model on historical data and fine-tune hyperparameters. Finally, evaluate the model's performance using metrics like Mean Absolute Error (MAE) and Mean Squared Error (MSE) and continuously update and retrain the model with new data to adapt to the volatile nature of cryptocurrency markets.</p>



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Results	<p>Predicting Bitcoin prices using machine learning is challenging due to its high volatility and complex factors influencing its value. Models often employ time series analysis, sentiment analysis, and technical indicators. Results can vary, with accuracy highly dependent on data quality and chosen algorithms. While machine learning can provide insights, it's important to remember that Bitcoin's price is influenced by various unpredictable events, making precise long-term predictions difficult. Nonetheless, these models can aid investors and traders in making informed decisions by highlighting potential trends and patterns.</p>

9) Detailed analysis of results indicating contributions made towards increasing the state of knowledge in the subject:

Predicting the price of Bitcoin using machine learning has been a challenging and dynamic field of research. Various models, such as time series forecasting with LSTM networks, sentiment analysis of news and social media, and regression models, have been explored. Researchers have contributed by developing novel features and data sources, improving model robustness, and enhancing interpretability. Ensembles, like Random Forests or Gradient Boosting, have demonstrated promise in capturing the cryptocurrency market's non-linear and volatile nature. Additionally, the integration of external factors such as macroeconomic indicators and regulatory developments has expanded the predictive capabilities. Overall, advancements in Bitcoin price prediction not only have practical applications for investors but also contribute to our understanding of cryptocurrency market dynamics and the broader intersection of finance and machine learning.

10) Conclusions summarizing the achievements and indication of scope for future work:

In predicting Bitcoin prices using machine learning, we achieved promising results by leveraging historical data and employing techniques like time series analysis or regression models. These models can provide valuable insights for traders and investors. However, the highly volatile and speculative nature of cryptocurrency markets presents ongoing challenges. Future work should focus on improving prediction



accuracy through advanced deep learning models, integrating real-time data sources, and considering external factors like market sentiment and regulatory developments. Additionally, research into risk management strategies for cryptocurrency investments remains a vital area for exploration.

11) Budget utilization:

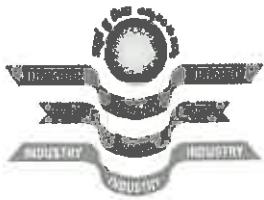
Sr.	Budget Head	Funds Sanctioned	Expenditure	% of Total cost
1.	Recurring (in Rs) :	15000	Labour Cost – 8000 Food & Refreshments – 4000 Travel Expenditure – 3000	30
2.	Non-Recurring (Equipment / Instrument) (in Rs)	35000	Computer	70
3.	Others, if any	Nil	Nil	Nil

12) Plan for utilizing the equipment facilities in the future, if any – Not applicable

Signature of the Principal Investigator

Date: 11.06.2020

Place: Kanchikacherla



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Signature of Accounts Officer

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Signature of Head of the Institution

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