Devineni Venkata Ramana & Dr.Hima Sekhar
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With Grade

FORMAT FOR INSTITUTE FUNDED SEED GRANT PROPOSAL

Name of the Principal Investigator: Mr. N V Subba Rao

Designation: Associate Professor

Department: Civil Engineering

Title of the Project: "Improvement of Compressive Strength of Pervious Concrete by Using Mineral Admixtures"

1. Background

1.1 Description of the problem

Pervious concrete is a special type of concrete, which consists of cement, coarse aggregates, water and if required, admixtures and other cementitious materials. As there are no fine aggregates used in the concrete matrix, the void content is more which allows the water to flow through its body. So, the pervious concrete is also called as Permeable concrete and porous concrete. There is lot of research work is going in the field of pervious concrete. "The compressive strength of pervious concrete is less when compared to the conventional concrete due to its porosity and voids. Hence, the usage of pervious concrete is limited even though it has lot of advantages. If the compressive strength and flexural strength of pervious concrete is increased, then it can be used for more number of applications. For now, the usage of pervious concrete is mostly limited to light traffic roads only. If the properties are improved, then it can also be used for medium and heavy traffic rigid pavements also. Along with that, the pervious concrete eliminates surface runoff of storm water, facilitates the ground water recharge and makes the effective usage of available land. The main aim of our project is to improve the strength characteristics of pervious concrete. But it can be noted that with increase in strength, the permeability of pervious concrete will be reduced. Hence, the improvement of strength should not affect the permeability property because it is the property which serves is purpose.

1.2 Rational for taking up the project: 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.

1.3 Description of Proposal

1.3.1 Objectives of the Project

The main reason pervious concrete is not used for high-traffic pavements, such as highways, is surface levelling.

- The compressive strength of the nominal pervious concrete is around 20MPa.So this can't be installed for the heavy load traffic situations.
- The parking areas are generally limited to auto parking and occasional trucks.

1.4 Innovative component of the project

Pervious concrete (also called porous concrete, permeable concrete, no fines concrete and porous pavement) is a special type of concrete with a high porosity used for concrete flatwork applications that allows water from precipitation and other sources to pass directly through hereby reducing the runoff from a site and allowing groundwater recharge. Pervious concrete is made using large aggregate with little to no fine aggregates. The concrete paste then coats the aggregates and allows water to pass through the concrete slab. Pervious concrete is traditionally used in parking areas, areas with light traffic, residential streets, pedestrian walkways, and greenhouses. It is an important application for sustainable construction and is one of many low impact development techniques used by builders to protect water quality.

1.5 Methodology detailing stepwise activities and sub-activities

Pervious concrete uses same materials as conventional concrete, except that there are usually No or little fine aggregates. The size of the coarse aggregate used is kept fairly uniform in size (most common is 3/8 inch) to minimize surface roughness and for a better aesthetic, however sizes can vary from 1/4 inch to 1/2 inch. Water to cement ratio should be within 0.27 to 0.43. Ordinary

Portland cement and blended cements can be used in pervious concrete. Water reducing admixtures and retarders can be used in pervious concrete. We can also add admixtures to gain compressive strength.

Fig.1: METAKAOLIN

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

The size of coarse aggregates, water to cement ratio and aggregate to cement ratio plays a crucial role in strength of pervious concrete.

The void ratio and unit weight are two important parameters of pervious concrete in the context of mix design.

The compressive strength and co- efficient of permeability of pervious concrete shall be inversely proportional to each other up to addition of 8% of fines.

Among the two methods of increasing compressive strength of pervious concrete, the addition of fines shall give more value when compared to replacement of cementitious materials.

The compressive strength of pervious concrete shall be increased when 10% of silica fume is added to the standard pervious concrete.

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

5. Suggested Post-Project Activities:

The compressive strength of pervious concrete shall be increased when 10% of silica fume is added to the standard pervious concrete.

6. Budget estimate

A. Recurring (in Rs):70,000

1. Metakaolin. 2. Ordinary Portland cement. 3. Water. 4. blended cement.

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

C. Total (in Rs):70,000

Date: 21.06.2018
Place: Kanchikacherla

Signature of the Principal Investigator

Devineni Venkata Ramana & Dr.Hima Sekhar
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Research and Development Cell

02.07.2018

To

Mr. N.V. Subba Rao,
Associate Professor,
Department of Civil Engineering,
Devineni Venkata Ramana & Dr. Hima Sekhar MIC College of Technology,
Kanchikacherla.

Sub: Letter of sanction

Dear **N.V. Subba Rao,**

The Management of Devineni Venkata Ramana & Dr. Hima Sekhar MIC College of Technology appreciate your efforts in submitting your proposal titled: **"Improvement of Compressive Strength of Pervious Concrete by Using Mineral Admixtures"** 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 70,000/- 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 Himasekhar
MIC College of Technology
Kanchikacherla, Krishna District

Copy to:

- HOD, Department of Civil Engineering, 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

Title of the project: "Improvement of Compressive Strength of Pervious Concrete by Using Mineral Admixtures"

1) **Name of the Principal Investigator(s) and Co-Investigator(s):** Mr. N V Subba Rao
2) **Date of commencement:** 02-07-2018
3) **Proposed date of completion:** 31.06.2019
4) **Actual date of completion:** 20.8.2019
5) **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 t aims to create.

Experimental set up	Compressive Strength Test
Methodology	Pervious concrete uses same materials as conventional concrete, except that there are usually No or little fine aggregates. The size of the coarse aggregate used is kept fairly uniform in size (most common is 3/8 inch) to minimize surface roughness and for a better aesthetic, however sizes can vary from 1/4 inch to 1/2 inch. Water to cement ratio should be within 0.27 to 0.43. Ordinary Portland cement and blended cements can be used in pervious concrete. Water reducing admixtures and retarders can be used in pervious concrete. We can also add admixtures to gain compressive strength.
Results	

	• The compressive strength of pervious concrete is increased by 4.36% when 10% of silica fume is added to the standard pervious concrete. • The compressive strength of pervious concrete is increased by 6.69% when 20% of silica fume is added to the standard previous concrete. • The compressive strength of pervious concrete is increased by 12.96% when 30% of silica fume is added to the standard pervious concrete. • The compressive strength of pervious concrete was increased gradually at all ages when increasing the rate of metakaolin content. • The compressive strength of pervious concrete was increased gradually by 4%with 10% increasing the rate of metakaolin content.

Cement-A cement is a binder, a chemical substance used for construction that sets, hardens, and adheres to other materials to bind them together. Cement is seldom used on its own, but rather to bind sand and gravel together.

Aggregates-pervious concrete does not contain any fine aggregates. This concrete is produced by eliminating fine aggregates from plain concrete. Only cement, coarse aggregate, and water are used. The coarse aggregate particles are surrounded by a thin cement paste coating.

Water-While any potable water can be used for mixing, the amount of water critical for the formation of the voids pervious concrete, Water-to-cement ratios can range from 0.36 to 0.45.

Silica fume-It is a by-product of silicone production. It consists of superfine spherical particles which significantly increase the strength and durability of concrete. Used frequently for high rise buildings, it produces concrete that exceeds 140MPa compressive strength. Silica fume can replace cement in quantities of 10-15%.

- A total No of 16 cubes is casted with various mix proportions.
- Our cubes are tested two times in their entire period i.e., 7 days and 28 days.
- Addition of silica fume and metakaolin is done to improve the compressive strength of pervious concrete.

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6) Budget utilization:

Sr.	Budget Head	Funds Sanctioned	Expenditure(In Rs.)	% of Total cost
1.	Recurring (in Rs) :	40,000	Labour Cost – 16000/- Cost of 1. Metakaolin. 2. Ordinary Portland cement. 3. Water. 4. blended cement ---12000/- Food & Refreshments – 8000/- Travel Expenditure – 4000/-	57.14
2.	Non-Recurring (Equipment/Instrument) (in Rs)	30,000	Testing Equipment--30000/-	42.85
3.	Others, if any	Nil	Nil	Nil

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

Signature of the Principal Investigator

Date: 20.8.2019

Place: Kanchikacherla

Devineni Venkata Ramana & Dr.Hima Sekhar
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NAAC A
With Grade

UTILIZATION CERTIFICATE

Certified that out of **Rs 70,000** of institute-funded seed grant for the **"Improvement of Compressive Strength of Pervious Concrete by Using Mineral Admixtures"** sanctioned during the Academic Year **2018-19** in favour of **Mr. N.V. Subba Rao** from the **Department of Civil Engineering** dated **02.7.2018** and a sum of **Rs. 70,000 (Rupees Seventy 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 Himasekhar
MIC College of Technology
Kanchikacherla, Krishna District

Devineni Venkata Ramana & Dr.Hima Sekhar
MIC College of Technology
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FORMAT FOR INSTITUTE FUNDED SEED GRANT PROPOSAL

Name of the Principal Investigator: Mr. K Prasad

Designation: Assistant Professor

Department: Civil Engineering

Title of the Project: "An expeimental study on stabilization of soil by using egg shell powder and quarry dust"

1. Background

1.1 Description of the problem

The stabilization of soil is a process used to improve the engineering properties of soils by adding various materials. In this study, quarry dust was used as a replacement for soil in varying percentages, and eggshell powder was introduced in different percentages to investigate their effectiveness in stabilizing the soil.

In this experimental study we use eggshell powder and quarry dust to enhance the properties of soil, the test were carried out using various percentages of quarry dust like 8% 16% % 24% and 32% as soil replacement and where max density value gained eggshell powder is added with a percentages of variation 4% 8% 12% and 16% to the weight of soil.

1.2 Rational for taking up the project:

Biodegradable Plastics are plastics that can be biologically broken down in a reasonable amount of time into their base compounds. It is an environment-friendly plastic. It can be decomposed, unlike typical and standard plastics. It would not harm human health when this plastic decomposes into the soil. It can decompose in soil and water

- ✓ Take less time to break down
- ✓ Environmentally friendly
- ✓ Easier to recycle
- ✓ Biodegradable plastics are not toxic

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 molding workpiece and study the comparison with conventional petroleum-based plastics.

This study also aims to investigate the effectiveness of using quarry dust and eggshell powder as stabilizers for black cotton soil and red soil.

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

The clayey and red soil will be replaced with four different percentage of quarry dust which were 8% 16% 24% and 32% by the weight of soil, where we get the maximum dry density of soil of that percentage of quarry dust replaced to the soil and we again add egg shell powder with varying percentage of 4% 8% 12% and 16% to weight of soil, the various test will be conducted are listed below.

1) Sieve analysis
2) Specific gravity
3) Compaction test
4) Atterberg limit.
   i) Liquid limit. Ii) Plastic limit.

MATERIAL USED:-

Quarry dust:- Quarry dust is a waste material that is generated from the stone crushing industry, in this experimental study we collected the quarry dust from donabanda near kanchikacherla, Andhra Pradesh, India.

Eggshell powder:-Egg shell powder is a waste material obtained from hotels and school Canteen. ESP was received after the outer cover has been cleaned mechanically. It was kept in an open atmosphere for 1 week, the dried eggshell grinded to make it fine powder and sieve from 90-micron sieve.

Black cotton soil:- The black cotton soil used in this study was collected from perakalapadu village close to Kanchikacherla, Andhra Pradesh, India. The general properties of the soil were studied in the laboratory. The soil was tested for sieve analysis, specific gravity, liquid limit, plastic limit, optimum moisture content, maximum dry density, unconfined compressive strength and California bearing ratio.

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

In this work, considering many nations around the arena are struggling with meal shortages, generating bioplastics from waste in place of meals is the high-quality way to head. This look concluded that meals wastes can be used for bioplastic production. in this look at, it became determined that the bioplastics created from potato peels absolutely biodegraded within 28 days, and it become suggested that those bioplastics may be utilized in the packaging industry. The development of mechanical properties has to be investigated for its usage of it in distinctive business regions. alternatively, it become determined that the industrial bioplastic did now not biodegrade in 28 days. Bioplastics utilization has extended in recent years both within the global and in Turkey. consequently, for the sustainability of the ones called as 'biodegradable', the

standards must be developed. In the end, a brand new guide for bioplastics needs to be evolved for manufacturing, usage and waste management in Turkey as quickly as possible.

Likely Impact(Please attempt to quantify) : Yes

4. Suggested Post-Project Activities:

This study aims to investigate the effectiveness of using quarry dust and eggshell powder as stabilizers for black cotton soil and red soil.

5. Budget estimate

A. Recurring (in Rs): 60,000

1. Quarry dust. 2. Black cotton soil. 3. Eggshell powder. 4. Red soil.

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

C. Total (in Rs):60,000

Date: 22.06.2018
Place: Kanchikacherla

Signature of the Principal Investigator

Devineni Venkata Ramana & Dr.Hima Sekhar
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Research and Development Cell

02.07.2018

To

Mr. K. Prasad,
Assistant Professor,
Department of Civil Engineering
Devineni Venkata Ramana & Dr. Hima Sekhar MIC College of Technology,
Kanchikacherla.

Sub: Letter of sanction

Dear K. Prasad,

The Management of Devineni Venkata Ramana & Dr. Hima Sekhar MIC College of Technology appreciate your efforts in submitting your proposal titled: **"An experimental study on stabilization of soil by using eggshell powder and quarry dust"** 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 Himasekhar
MIC College of Technol...
Kanchikacherla, Krishna Distri...

Copy to:

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

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PROJECT COMPLETION REPORT FOR INSTITUTE FUNDED SEED GRANT

Title of the project: : "An experimental study on stabilization of soil by using egg shell powder and quarry dust"

1) **Name of the Principal Investigator(s) and Co-Investigator(s):** Mr. K Prasad
2) **Date of commencement:** 02-07-2018
3) **Proposed date of completion:** 31.06.2019
4) **Actual date of completion:** 20.8.2019
5) **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 t aims to create.

Experimental set up	1) Sieve analysis 2) Specific gravity 3) Compaction test 4) Atterberg limit. i) Liquid limit. ii) Plastic limit. 5) UCS 6) CBR
Methodology	The clayey and red soil will be replaced with four different percentage of quarry dust which were 8% 16% 24% and 32% by the weight of soil, where we get the maximum dry density of soil of that percentage of quarry dust replaced to the soil and we again add egg shell powder with varying percentage of 4% 8% 12% and 16% to weight of soil, the various test will be conducted.
Results	

	• The optimum mix proportion was found to be 76% soil+24% quarry dust + 8% Egg shell powder for Black cotton soil. • Liquid limit value is increased by 40%. • Plastic limit value is increased by 49%. • For this optimum mix proportion MDD is increases by 19.04%and OMC is increased by 4.69%. • The CBR value is increased by 39.45%. • The UCS value is increased by 60%. • The optimum mix proportion was found to be 84% soil+16%of quarry dust+12% of eggshell powder for Red soil. • Liquid limit value is increased by 43.51% • Plastic limit value is increased by 56%.

The various test will be conducted are listed below.

1) Sieve analysis

2) Specific gravity
3) Compaction test
4) Atterberg limit.
   i) Liquid limit.
   ii) Plastic limit.

MATERIAL USED:-

Quarry dust:- Quarry dust is a waste material that is generated from the stone crushing industry, in this experimental study we collected the quarry dust from donabanda near kanchikacherla, Andhra Pradesh, India.

Eggshell powder:-Egg shell powder is a waste material obtained from hotels and school Canteen. ESP was received after the outer cover has been cleaned mechanically. It was kept in an open atmosphere for 1 week, the dried eggshell grinded to make it fine powder and sieve from 90-micron sieve.

Black cotton soil:- The black cotton soil used in this study was collected from perakalapadu village close to Kanchikacherla, Andhra Pradesh, India. The general properties of the soil were studied in the laboratory. The soil was tested for sieve analysis, specific gravity, liquid limit, plastic limit, optimum moisture content, maximum dry density, unconfined compressive strength and California bearing ratio.

6) Budget utilization:

Sr.	Budget Head	Funds Sanctioned	Expenditure(In Rs.)	% of Total cost
1.	Recurring (in Rs) :	40,000	Labour Cost – 16000/- Cost of 1. Quarry dust. 2. Black cotton soil. 3. Eggshell powder. 4. Red soil --- 10000/- Food & Refreshments – 10000/- Travel Expenditure – 4000/-	66.67
2.	Non-Recurring (Equipment/Instrument) (in Rs)	20,000	Equipment	33.33
3.	Others, if any	Nil	Nil	Nil

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

Signature of the Principal Investigator
Date: 20.8.2019
Place: Kanchikacherla

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UTILIZATION CERTIFICATE

Certified that out of **Rs 60,000** of institute funded seed grant for **"An expeimental study on stabilization of soil by using egg shell powder and quarry dust"** sanctioned during the Academic Year **2018-19** in favour of **Mr. K. Prasad** from **Department of Civil Engineering** dated **02.7.2019** and a sum of **Rs. 60,000 (Rupees Sixty 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 Himasekhar
MIC College of Technol
Kanchikacherla, Krishna Dist.

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

Name of the Principal Investigator: Dr.T Vamsee Kiran

Designation: Professor

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

Designation: Nil

Department: EEE

Title of the Project: GSM Based Smart Energy Meter System

1.Background

1.1 Description of Proposal: In this modern world we are living in the "Automation world" because nowadays all are depending and addicted to this automation instead of the man power. This kind of sustenance is now spreading in all nations particularly like our developing nations. Also, one of the most imminent things in this world is Electricity which is highly used in many places such as for agricultural, industrial and also for household purposes. Although we enriched with electricity sources, till we are suffered with many problems in energy distribution, measuring the bill and controlling the energy consumption. We know that electricity is playing an important role by giving coziness to our life so it should be used very carefully by without wasting it Electricity is one of the vital requirements for the sustainability of life's comforts. This can be achieved by implementing pay first and then use energy system. In this system the load gets disconnected when the units become zero and it is reconnected when the user recharges it.

1.2 Objectives of the project: To develop a smart energy meter which has many advantages like monitoring and controlling the energy meter at anywhere and at any place.

1.3 Methodology: Microcontroller, LCD and the GSM unit is interfaced with the power Meter of each house. Every meter has a separate RR quantity, which is given with the aid of the electricity providing organizations. The heart beat from the energy meter is given to optocoupler and output of the optocoupler is given to the microcontroller. The microcontroller constantly decrements the quantity of gadgets (1unit= 1 kWh) as consistent with electricity consumption and shows the available gadgets on the LCD connected to the strength meter.

In this project current and voltage transformers and simultaneously as contradict to voltage detectors are used. A observation from the software organization is gained from the automatic energy meter which is a programmable one and the activities done by the meter is highly matched with the given

enumeration a main advantage of automatic Energy meter is that we can disconnect and reconnect the power supply of the user without the help of the man

Power and can also reconnect the power supply once it is disconnected.

The main characteristic of the Automatic Energy meter is that it alerts the client by ringing an alarm whilst the consumer load crosses the threshold restriction. If the consumer does not reduce his power usage, then the meter automatically cut off the connection.

3. Total (in Rs): Rs.60000/-

Date: 18.06.2018
Place: Kanchikacherla

Signature of the Principal Investigator

Devineni Venkata Ramana & Dr.Hima Sekhar
MIC College of Technology
(Approved by AICTE & Permanently Affiliated to JNTUK, Kakinada)
Kanchikacherla - 521180, Krishna Dist, A.P, India.
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B.Tech (CSE|ECE|EEE)
Accredited by NAAC With Grade A

02.07.2018

To

Dr. T. Vamsee Kiran,
Professor,
Department of Electrical and Electronics Engineering,
Devineni Venkata Ramana & Dr. Hima Sekhar MIC College of Technology,
Kanchikacherla.

Sub: Letter of sanction

Dear **T. Vamsee Kiran,**

The Management of Devineni Venkata Ramana & Dr. Hima Sekhar MIC College of Technology appreciate your efforts in submitting your proposal titled: **"GSM Based Smart Energy Meter 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 Himasekhar
MIC College of Technology
Kanchikacherla, Krishna District

Copy to:

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

Research and Development Cell

Devineni Venkata Ramana & Dr.Hima Sekhar
MIC College of Technology
(Approved by AICTE & Permanently Affiliated to JNTUK, Kakinada)
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Accredited by NAAC With Grade A

PROJECT COMPLETION REPORT FOR INSTITUTE FUNDEDSEED GRANT

1) **Title of the project:** GSM Based Smart Energy Meter System
2) **Name of the Principal Investigator(s) and Co-Investigator(s):** Dr. T Vamsee Kiran
3) **Date of commencement:** 02.07.2018
4) **Proposed date of completion:** 07.06.2019
5) **Actual date of completion:** 02.06.2019
6) **Objectives as stated in the project proposal:**

   To develop a smart energy meter which has many advantages like monitoring and controlling the energy meter at anywhere and at any place.

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. Energy Meter 2. GSM Module 3. Interrupting relay 4. Bread board 5. Load 6. Arduino microcontroller 7. LCD display
Methodology	Microcontroller, LCD and the GSM unit is interfaced with the power Meter of each house. Every meter has a separate RR quantity, which is given with the aid of the electricity providing organizations. The heart beat from the energy meter is given to optocoupler and output of the optocoupler is given to the microcontroller. The microcontroller constantly decrements the quantity of gadgets (1unit= 1 kWh) as consistent with electricity consumption and shows the available gadgets on the LCD connected to the strength meter.
Results	It is observed that once the system gets ready the load automatically turns ON and the units are consumed and total balance is shown and it decreases as the power is consumed.

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

The correctness of proposed system is checked by comparing the values which may be displayed in LCD display of Automatic energy meter and the units that have been consumed also received through SMS. The system is also checked by connecting and disconnecting the client connections and found correct.

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

The evolved GSM primarily based energy meter reading and billing are useful for each electricity provider supplying utility and customers. This machine overcomes the drawbacks of the conventional meter reading system and affords extra offerings together with energy cut and tampering alert. The evolved system additionally gives records about daily, month-to-month, and yearly electricity utilization details regarding day-by-day power intake will assist the customer to control their strength usage. This developed gadget is dependable and relaxed as best legal individuals can access the device.

11) Budget utilization:

S.NO	Budget Head	Funds Sanctioned	Expenditure	% of Total cost
1	Recurring (in Rs) :	15000	Stationaries – 6500 Food & Refreshments – 3500 Connectivity – 2500 Travel Expenditure – 2500	27.28
2.	Non-Recurring (Equipment / Instrument) (in Rs)	40000	1. Energy Meter 2. GSM Module 3. Interrupting relay 4. Bread board 5. Load 6. Arduino microcontroller 7. LCD display	72.72
3	Others, if any	5000	Miscellaneous	5000

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

Signature of the Principal Investigator
Date: 02.06.2019
Place: Kanchikacherla

Devineni Venkata Ramana & Dr.Hima Sekhar
MIC College of Technology
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Accredited by
NAAC With Grade A

UTILIZATION CERTIFICATE

Certified that out of **Rs 60,000** of institute funded seed grant for the **"GSM Based Smart Energy Meter System"** sanctioned during the Academic Year **2018-19** in favour of **Dr. T Vamsee Kiran** from **Department of Electrical and Electronics Engineering** dated **02.7.2018** and a sum of **Rs. 60,000 (Rupees Sixty 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 Himasekha
MIC College of Technology
Kanchikacherla, Krishna Distri

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

FORMAT FOR INSTITUTE FUNDED SEED GRANT PROPOSAL

Name of the Principal Investigator: Dr.Deepak Kumar

Designation: Associate professor

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

Designation: Nil

Department: EEE

Title of the Project: Solar Wireless Electric Vehicle Charging System

1. Background

Description of Proposal: This project describes the design of solar powered Charging System for electric vehicle that solves the key downside of fuel and pollution. Electric vehicles have now hit the road worldwide and are slowly growing in numbers. Apart from environmental benefits electric vehicles have also proven helpful in reducing cost of travel by replacing fuel by electricity which is way cheaper. We develop an EV charging system that solves with a unique innovative solution. This method of charging the vehicles requires no wires, no need of a stop for charging as vehicle charges while moving, since solar power is used for charging no external power supply needed. The system makes use of a solar panel, battery, transformer, regulator circuitry, copper coils, AC to DC converter, atmega controller and LCD display to develop the system. The system demonstrates how electric vehicles can be charged while moving on the road, eliminating the need to stop for charging. Thus the system demonstrates a solar powered wireless charging system for electric vehicles that can be integrated in the road.

1.2 Objectives of the project: A solar wireless EV charging system can contribute to the broader goals of reducing greenhouse gas emissions, transitioning to sustainable energy sources, and making electric vehicle ownership more convenient and accessible.

1.3 Methodology: The solar panel is used to power the battery through a charge controller. The battery is charged and stores d- power. The DC power needs to be converted to AC for transmission for this purpose we use a converter & transformer. The power is converted to AC using converter and the regulated using regulator circuitry. This power is used to power the copper coils that are used for wireless energy transmission. A copper coil is also mounted underneath the electric vehicle. When the vehicle is driven over the coils energy is transmitted from the transmitter coil to EV coil. The energy is still DC

current that is induced into this coil. Now we convert this to DC again so that it can be used to charge the EV battery. AC to DC conversion circuitry is used to convert it back to DC current. The input voltage is measured using an ATmega microcontroller and display this on an LCD display. Thus the system demonstrates a solar powered wireless charging system for electric vehicle that can be integrated in the road.

3. Total (in Rs): Rs. 60,000/-

Date: 20.06.2018
Place: Kanchikacherla

Signature of the Principal Investigator

Devineni Venkata Ramana & Dr.Hima Sekhar
MIC College of Technology
(Approved by AICTE & Permanently Affiliated to JNTUK, Kakinada)
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02.07.2018

To

Dr. Deepak Kumar,
Associate Professor,
Department of Electrical and Electronics Engineering,
Devineni Venkata Ramana & Dr. Hima Sekhar MIC College of Technology,
Kanchikacherla.

Sub: Letter of sanction

Dear **Deepak Kumar,**

The Management of Devineni Venkata Ramana & Dr. Hima Sekhar MIC College of Technology appreciate your efforts in submitting your proposal titled: **"Solar Wireless Electric Vehicle Charging 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 Himasekhar
MIC College of Technology
Kanchikacherla, Krishna District

Copy to:

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

Research and Development Cell

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With Grade

PROJECT COMPLETION REPORT FOR INSTITUTE FUNDED SEED GRANT

1) **Title of the project:** Solar Wireless Electric Vehicle Charging System
2) **Name of the Principal Investigator(s) and Co-Investigator(s):** Dr.Deepak Kumar
3) **Date of commencement:** 02.07.2018
4) **Proposed date of completion:** 07.06.2019
5) **Actual date of completion:** 22.06.2019
6) **Objectives as stated in the project proposal:**

A solar wireless EV charging system can contribute to the broader goals of reducing greenhouse gas emissions, transitioning to sustainable energy sources, and making electric vehicle ownership more convenient and accessible.

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. Solar Panel 2. Battery 3. Transformer 4. Regulator circuitry 5. AC to DC controller 6. Atmega controller 7. LCD display
Methodology	The solar panel is used to power the battery through a charge controller. The battery is charged and stores dc power. The DC power needs to be converted to AC for transmission for this purpose we use a converter & transformer. The power is converted to AC using converter and the regulated using regulator circuitry. This power is used to power the copper coils that are used for wireless energy transmission. A copper coil is also mounted underneath the electric vehicle. When the vehicle is driven over the coils energy is transmitted from the transmitter coil to EV coil. The energy is still DC current that is induced into this coil. Now we convert this to DC again so that it can be used to charge the EV battery. AC to DC conversion circuitry is used to convert it back to DC current. The input voltage is measured using an Atmega microcontroller and display this on an LCD display. Thus the system demonstrates a solar powered wireless charging system for electric vehicle that

	can be integrated in the road.
Results	Improved battery's lifetime due to reduction in temperature of battery.

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

Through the analysis, it can be found that the reason of frequency splitting includes the change of quality and coupling coefficient. When the structure of the primary winding is changed, the coupling coefficient of the whole system is also changed so that the frequency splitting will happen. The structure of multiple primary winding is used in many fields. When the structure of multiple primary winding is used, the load resistance and the number of the primary winding should be carefully thought about.

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

Through the analysis and comparison of the wireless charging system, it can be found that when the effective radius is equal, the square coil can produce more mutual inductance than circular coil. The output characteristics of the secondary side can be improved when the number of the primary coil is increased in a certain range. The structure of the original coils can also improve the safety of the inductive charging system. When the coil is aging, we should just replace one parallel branch of them. But when the number of primary winding is increasing, the frequency splitting will happen.

11.Budget utilization:

S.NO	Budget Head	Funds Sanctioned	Expenditure	% of Total cost
1	Recurring (in Rs) :	15000	Stationaries – 7000 Food & Refreshments – 3000 Connectivity - 2500 Travel Expenditure – 2500	10
2.	Non-Recurring (Equipment / Instrument) (in Rs)	40000	1. Solar Panel 2. Battery 3. Transformer 4. Regulator circuitry 5. AC to DC controller 6. Atmega controller 7. LCD displa	80
3	Others, if any	5000	Miscellaneous	10

Devineni Venkata Ramana & Dr.Hima Sekhar
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With Grade

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

Signature of the Principal Investigator

Date: 22.06.2019

Place: Kanchikacherla

Devineni Venkata Ramana & Dr.Hima Sekhar
MIC College of Technology
(Approved by AICTE & Permanently Affiliated to JNTUK, Kakinada)
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UTILIZATION CERTIFICATE

Certified that out of **Rs 60,000** of institute funded seed grant for the **"Solar Wireless Electric Vehicle Charging System "** sanctioned during the Academic Year **2018-19** in favour of **Dr. Deepak Kumar** from **Department of Electrical and Electronics Engineering** dated **02.7.2018** and a sum of **Rs. 60,000 (Rupees Sixty 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 Himasekha
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Kanchikacherla, Krishna Distric

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FORMAT FOR INSTITUTE-FUNDED SEED GRANT PROPOSAL

Name of the Principal Investigator: Dr. V. Srinivasa Sai

Designation: Professor

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

Department: Mechanical Engineering

Title of the Project: Experimental & Simulation of Machining study of Inconel-825 workpiece

1. Background

1.1 Description of problem (Brief)

In the manufacturing and production industries, machining is one in all the foremost used techniques so as to get the required final form of a body, changing the workpiece into finished merchandise by material removal techniques, continually taking into account surface quality and dimensional accuracy. The foremost common machining methods are milling, turning, threading, drilling, and grinding.

Turning process is one in all the foremost common machining operation utilized in manufacturing and production industry, possessing endless applications. Habitually, turning operation consists primarily in decreasing the diameter of a cylindrical workpiece or perhaps changing it to a rounded cross-section. This method is obtained by mounting and revolving the workpiece about the axial spindle of the machine and layer is removed by feeding perpendicularly the cutting edge of the tool with a particular penetration over the exterior surface of the workpiece.

Unquestionably, for every and each machining technique heat generation is an assued issue, and this happens in 3 completely different ways: by the deformation of the metal (primary shear zone), frictional force between the hip-tool interaction (secondary deformation zone) and by the rubbing action between the tool and machined surface (tertiary deformation zone). These factors will induce nearly 70% - 80% of the structural errors on the workpiece if not properly controlled. Therefore, a convenient understanding of the deviation of the thermal behaviours throughout the workpeice-tool interaction is indispensable. Metal-cutting investigators have

established several modelling methods for simulation purposes including analytical methods, slip-line results, empirical approaches, and finite element procedures. Recently, finite element procedures have significantly become the primary means for simulating metal-cutting processes. Finite element procedures are extensively utilized to work out deformation, strain, stress, temperature, heat flux within the primary, secondary and tertiary deformation zone. In this project, FEA models of tool and holder are developed so as to evaluate the temperature deviation over the tool surface and validate the experimental outcomes with the simulated results.

1.2 Rational for taking up the project:

Due to the fact of the newness of thermal-fluid interaction in the simulation of metal cutting, its features and performance are not completely understood. Consequently, there were some limitations to conduct the research in the part of comparison of the results with the empirical one such as deformation and different temperature values. In this, an attempt is made to model the cutting processes for the study of temperature distribution in both experimental and simulation fields.

1.3 Description of Proposa

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

Experimental testing of temperature distribution on tungsten carbide cutting tool surface while machining Inconel 825 workpiece.

To validate the variation in thermal behaviour of the tungsten carbide tool for cutting of Inconel 825 workpiece.

To develop the relationship between machining parameters, temperature, and total deformation.

To compare the temperature distribution along the tool surface, for dry machining and wet machining of experimental and simulated values.

1.4 Innovative component of the project (Brief)

High heat generation is one of the most crucial problems that can be generated while machining. An estimation of nearly 70 % - 80% of the structural errors on the workpiece is caused by the thermal errors of the tool. Inconel 825 material is a superalloy, mostly used in aerospace industries for hot sections of turbo reactors as well as in landing gears. It is an excellent general-purpose material for elevated temperature use in high-strength, oxidation

problem areas. The novelty of this project is to validate the variation in thermal behaviour of the tungsten carbide tool for cutting of Inconel 825 workpiece with and without the application of coolant using defined parameters in order to study the temperature distribution in the tool.

1.5 Methodology detailing stepwise activities and sub-activities

Inconel material was shaped into required dimensions i.e. the length of the material is 220 mm and the diameter is around 31 mm. So, using a Power Hacksaw and a High-Speed Steel Hacksaw Cutting blade, the material was cut into the required length. Turing and facing operations were performed HSS cutting tool to get the required diameter. Now the workpiece was placed on a central lathe with variable sapped and freed drive supported by the tailstock. The workpiece was properly aligned and the tool and tool holder were placed in their positions and the setup was ready to carry out the cutting. The cutting was carried out with and without the use of the coolant. The dry cutting was performed with user-defined parameters (Speed, Feed & Depth of Cut). Using an orthogonal L9 array, the parameters were selected to carry out 9 experiments. During the dry-cutting operation, the cutting temperature was found with the help of an infrared pyrometer. In the Wet cutting process, the coolant used was Rust-X Cutting Oil WS-50. To carry out the simulation, the model was developed using Solidworks. Tool holders, cutting tool, and cooling structures are modelled and assembled in the design software. Dry cutting and Wet Cutting were simulated in the ANSYS workbench.

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 experimental investigation and finite element simulation were carried out on dry cutting and wet cutting of Inconel-825 using a lathe machine and carbide-coated cutting tool. The outcome showed that the finite element simulation was validated by experiments. Based on

the results, well-developed finite element models can be utilized for the analysis of dry and wet cutting phenomena in the metal machining process without the need for experimentation.

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

5. Suggested Post Project Activities:

6. Budget estimate

A. Recurring (in Rs): Nil

B. Non-Recurring (Equipment / Instrument) **(in Rs): 60,000.00**

C. Total (in Rs): 60,000.00

VS

Date: 27.06.2018
Place: Kanchikacherla

Signature of the Principal Investigator

Devineni Venkata Ramana & Dr.Hima Sekhar
MIC College of Technology
(Approved by AICTE & Permanently Affiliated to JNTUK, Kakinada)
Kanchikacherla - 521180, Krishna Dist, A.P, India.
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02.07.2018

To

Dr. V. Srinivasa Sai,
Professor,
Department of Mechanical Engineering
Devineni Venkata Ramana & Dr. Hima Sekhar MIC College of Technology,
Kanchikacherla.

Sub: Letter of sanction

Dear **V. Srinivasa Sai,**

The Management of Devineni Venkata Ramana & Dr. Hima Sekhar MIC College of Technology appreciate your efforts in submitting your proposal titled: **"Experimental & Simulation of Machining Study of Inconel-825 Workpiece"** 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 Himasekhar
MIC College of Technology
Kanchikacherla, Krishna Distric

Copy to:

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

Research and Development Cell

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

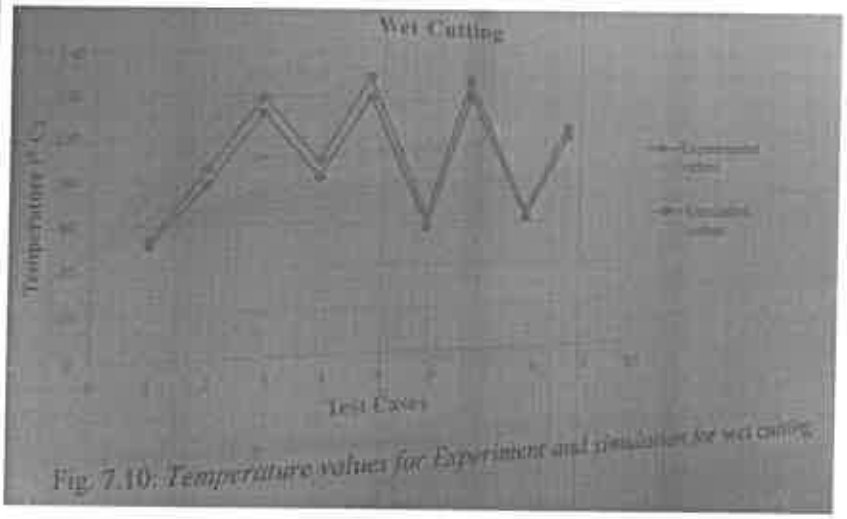
Title of the project: Experimental & Simulation of Machining Study of Inconel-825 Workpiece

1) **Name of the Principal Investigator:** Dr. V. Srinivasa Sai
2) **Date of commencement:** 02.07.2018
3) **Proposed date of completion:** 19.07.2019
4) **Actual date of completion:** 26.07.2019
5) **Objectives as stated in the project proposal:**

Experimental testing of temperature distribution on tungsten carbide cutting tool surface while machining Inconel 825 workpiece. To validate the variation in the thermal behaviour of the tungsten carbide tool for cutting of Inconel 825 workpiece. L9 orthogonal array used to find the influence of machining parameters on temperature distribution. A relationship between machining parameters, temperature and total deformation developed. Transient heat transfer and CFD simulation were carried out in ANSYS workbench. Simulated the temperature and deformation on the tool, from the experimental parameters. Comparison between temperature distribution along the tool surface, for dry machining and wet machining of experimental and simulated values has been done.

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

Experimental setup	Lathe machine, carbide-coated cutting tools, Inconel-825
Methodology	Inconel material was cut into required length and diameter. The Inconel workpiece was placed on a central lathe with variable sapped and freed drive supported by the tailstock. The workpiece was properly aligned and the tool and tool holder were placed in their positions and the setup was ready to carry out the cutting. The cutting was carried out with and without use of the coolant. The dry cutting was performed with user-defined parameters (Speed, Feed & Depth of Cut). Using an orthogonal L9 array, the parameters were selected to carry out 9 experiments. During dry cutting operation, the cutting temperature was found out with the help of an infrared pyrometer. In Wet cutting process, the coolant used was Rust-X Cutting Oil WS-50. To carry out the simulation, the model was developed using Solidworks. Tool holder, cutting tool, cooling structures

	are modelled and assembled in the design software. Dry cutting and Wet Cutting were simulated in ANSYS workbench.
Results	A comparative plot of temperatue with test cases for dry cutting and wet cutting respectively. The comparison shows that temperatures generated during machining with dry cutting were lesser than that machining with wet cutting.  Fig 7.10: *Temperature values for Experiment and simulation for wet cutting* Highest temperature generated for the machining parameters of v = 95 m/min, f = 0.04 mm/rev and d = 3 mm in both dry and wet cases followed by v= 80 m/min, f=0.08 mm/rev and d = 0.3 mm. The lowest temperature was observed for v = 65 m/min, f = 0.04 mm/rev and d = 0.1 mm.

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

The experiments were performed on the Inconel material using orthogonal cutting process under dry and wet conditions. The number of experiments were selected according orthogonal L9

array. Machining parameters are cutting speed (65, 80, 95 m/min), feed (0.04, 0.08, 0.12 mm/rev), and depth of cut (0.1, 0.2, 0.3 mm). After completing the experiments and simulation, it was observed that the maximum temperature of 165°C and 172.43°C were found in experiments and simulation respectively for dry cutting at high cutting speed of 95m/min with feed as 0.04 mm/rev and depth of cut 0.3 mm. In the case of wet cutting, for the same machining parameters, the maximum temperatures were 123°C and 130°C in experiments and simulation respectively. At 65 m/min constant speed the temperature values are high for highest depth of cut and feed rate for both dry and wet cutting. It was found that at a constant feed of 0.08 mm/rev with variable speed when the depth of cut is highest the temperature was found to be highest in both dry and wet cutting.

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

Experimental investigation and finite element simulation of dry cutting and wet cutting of Inconel-825 using a lathe machine and carbon coated cutting tool. The simulation results of tool surface temperatures were agreeable to the experimental results and the errors are within 8%. A peak temperature is observed at 95 m/min cutting speed and the temperature increases as the cutting speed increases. Heat produced is observed to be less when wet cutting is performed. Temperature developed is very less during wet cutting as compared to dry cutting due to the fact heat is taken away by the coolant and convection. Based on the results, if finite element models are well developed, with appropriate assumptions, can be employed for the analysis of the phenomenon of dry and wet cutting in metal machining process without the need for experiments.

10) Budget utilization:

Sr.	Budget Head	Funds Sanctioned	Expenditure	% of Total cost
1.	Recurring (in Rs) :	-----	-----	-----
2.	Non-Recurring (Equipment / Instrument) (in Rs)	60,000.00	Residual stress measurement	100
3.	Others, if any	Nil	Nil	Nil

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

Date: 26.07.2019

Signature of the Principal Investigator

Place: Kanchikacherla

Devineni Venkata Ramana & Dr.Hima Sekhar
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B.Tech (CSE|ECE|ME)
Accredited by
NAAC A
With Grade

UTILIZATION CERTIFICATE

Certified that out of **Rs 60,000** of institute funded seed grant for **"Experimental & Simulation of Machining study of Inconel-825 workpiece"** sanctioned during the Academic Year **2018-19** in favour of **Dr. V. Srinivasa Sai** from **Department of Mechanical Engineering** dated **02.7.2018** and a sum of **Rs. 60,000 (Rupees Sixty 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 Himasekha
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: Dr. Naveen Sharma

Designation: Associate Professor

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

Designation: Nil

Department: Mechanical Engineering

Title of the Project: Design And Fabrication of Six-Legged Kinematic Machine for Material Handling

1. Background

1.1 Description of problem (Brief)

There are different types of legged walking machines are available. They are roughly divided into groups according to the number of legs they possess. Bipeds have two legs, quadrupeds have four legs, hexapods have six legs and octopods have eight legs. Biped robots are dynamically stable but statically unstable, such robots are harder to balance, and dynamic balance can only be achieved during walking. Hexapods are six-legged robots that, on the other hand, have the advantage of being statically stable. During walking they can move three legs at a time, thus leaving three other legs always on the ground forming a triangle. Like many other branches of science and engineering, walking robotics research also gathered new momentum after the Second World War due to the new inventions in mechanisms, material science, electronics, control systems, and computers. This laid the foundation of modern walking robotics research for the systematic design and development of walking machines for their intended applications in rough terrain.

A legged moving machine is well suited for rough terrain. It is able to climb steps, cross gaps that are as large as its stride, and to walk on extremely rough terrain where, due to ground irregularities, the use of wheels would not be feasible. To make a legged robot mobile each leg must have at least two degrees of freedom (DOF). For each DOF one joint is needed, which is usually powered by one servo motor. Because of this, a four-legged moving machine needs at least eight servos to travel around.

The main advantage of legged robots is their ability to access places impossible for wheeled robots. By copying to the physical structure of legged animals, it may be possible to improve the performance of mobile robots. To provide more stable and faster walking, scientists and engineers can implement the relevant biological concepts in their design. Hua Deng et al. discussed about the Hexapod robots are easy to realize walking in complicated environments and have the characteristic of high stiff gait. It is well worth taking advantage of hexapod robots' versatility, such as using legs to do manipulation or carry objects. The literature review reveals that the moving leg mechanism has the number of links and different mechanisms involved in the design.

1.2 Rational for taking up the project:

From the literature, it was learned that walking mechanisms are developed by imitating nature like insect movement. Wheeled locomotion is not suitable for rough surfaces. To achieve statically and dynamically the robot must have a minimum of four legs. By providing six legs to the walking robot we get a more stable and stiff gait. By using a bar mechanism it converts rotary motion into oscillating motion.

1.3 Description of Proposal

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

The literature review reveals that the moving leg mechanism has a number of links and different mechanisms involved in the design. The main objectives of this project is

1. To provide six legs.
2. To provide a four-bar mechanism.
3. To achieve obstacles overcoming
4. To walk on any surface.

1.4 Innovative component of the project (Brief)

The kinematic moving machine consists of six legs that move simultaneously to provide motion. The six-leg kinematic movement works on "Grashof's" principle which states that the sum of the length of the shortest and longest links must be less than or equal to the sum of the other two links.

The wheeled robots are not suitable for rough surfaces, on rocky surfaces the wheeled robot can't pass over rocks or even small stones. In sand surface the wheeled robots get struck and slip.

The scope of our project is to make this machine walk on any surface with a stiff gait slow and carry a limited load. This project involves the design and fabrication of a six-legged kinematic moving machine with a bar mechanism. In this mechanism, links are connected by pivot joints and convert the rotating motion of the crank into the movement of the foot similar to that of animal walking. The design is created in Solid Works Software. It is an arrangement of six linkages together are powered by a single motor. The motor can be powered by the battery.

Hence by using a four bar mechanism, the six-legged kinematic moving machine is moved on different surfaces with limited load. As compared to Grass and sand surfaces the six- legged kinematic moving machine moves on a plane surface with maximum speed.

1.5 Methodology detailing stepwise activities and sub-activities

The project is designed with four bar mechanism, legs moment arrangement and material handling arrangement. Legs moving arrangement are controlled by using four bar mechanism. The Six-legged kinematic moving machine consist of two sections. One section is automatic feeding mechanism and the second is conversion of rotary motion into oscillating motion of a leg. The first section consists of one sprocket wheel keyed to motor shaft at the end, other two sprocket wheels are connected at the fixed link. These three sprocket wheels are connected by the roller chain. These sprocket wheels transmit the rotary motion from motor to crank. Hence when the sprocket wheel is rotating the crank is also rotates for walking operation. The second section consists of electrically operated DC wiper motor, four bar mechanisms and connecting rods. The second is used to convert the rotary motion of a crank into oscillating motion of the leg. The crank is keyed to the rotating shaft at one end and other end is connected to the leg. This shaft is connected to the DC wiper motor. The crank is rotating and converts the rotary motion to oscillating motion and moment of leg is takes automatically.

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 report & Paper Communication

3. Expected Outcome and Deliverables of the Project

The developed six-legged kinematic moving machine is utilized to travel into spaces currently inaccessible to wheels without microprocessor control and other actuator devices, walk over curbs, climb grass, or go through open terrain. Obstacles that are 50 mm tall are traversed by the six-legged kinematic moving machine. Employing a straightforward four-bar arrangement to transfer power from the motor to all leg links for transporting a load on various surface types, it is quite helpful.

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

5. Suggested Post Project Activities:

6. Budget estimate

A. Recurring (in Rs): Nil

B. Non-Recurring (Equipment / Instrument) **(in Rs): 65,000.00**

C. Total (in Rs): 65,000.00

Date: 18.06.2018
Place: Kanchikacherla

Signature of the Principal Investigator

Devineni Venkata Ramana & Dr.Hima Sekhar
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02.07.2018

To

Dr. Naveen Sharma,
Associate Professor,
Department of Mechanical Engineering
Devineni Venkata Ramana & Dr. Hima Sekhar MIC College of Technology,
Kanchikacherla.

Sub: Letter of sanction

Dear **Naveen Sharma,**

The Management of Devineni Venkata Ramana & Dr. Hima Sekhar MIC College of Technology appreciate your efforts in submitting your proposal titled: **"Design and Fabrication of Six-Legged Kinematic Machine for Material Handling"** 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 Himasekhar
MIC College of Technolo
Kanchikacherla, Krishna Distric

Copy to:

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

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

Title of the project: Design and Fabrication of Six-Legged Kinematic Machine for Material Handling

1) **Name of the Principal Investigator(s):** Dr. Naveen Sharma
2) **Date of commencement:** 02.07.2018
3) **Proposed date of completion:** 19.07.2019
4) **Actual date of completion:** 29.07.2019

5) **Objectives as stated in the project proposal:**

The literature review reveals that the moving leg mechanism has a number of links and different mechanisms involved in the design. The main objectives of this project is

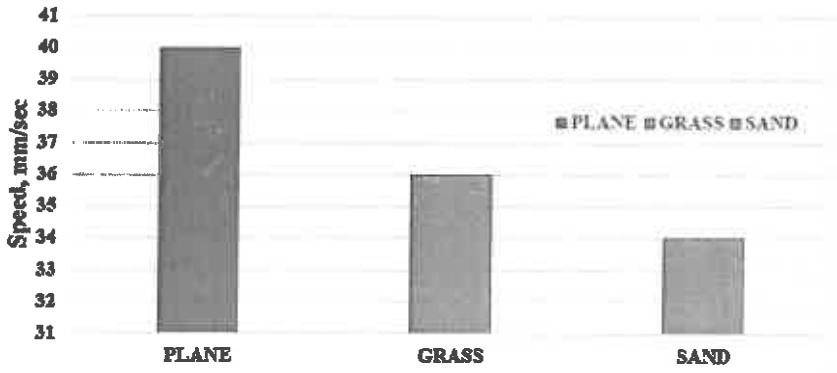
1. To provide six legs.
2. To provide a four-bar mechanism.
3. To achieve obstacles overcoming
4. To walk on any surface.

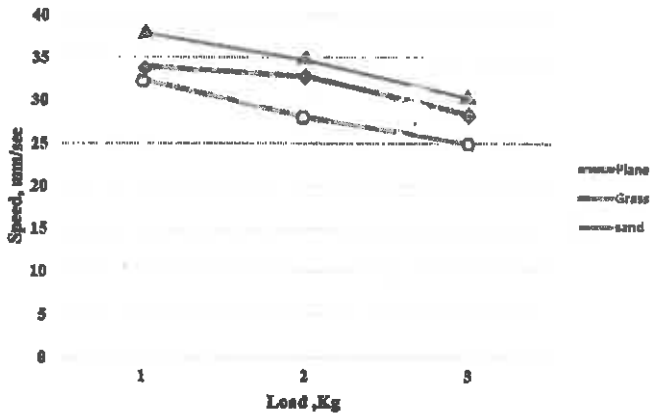
6) **Deviation made from original objectives if any, while implementing the project and reasons thereof: No**

7) **Details of the experimental setup, methods adopted, data collected supported by the necessary table, charts, diagrams & photographs:**

Experimental setup	Mechanisms, DC motors
Methodology	There are two parts to the six-legged kinematic moving machine. The automatic feeding mechanism is in the first segment, and the leg's rotating motion is transformed into an oscillating motion in the second. One sprocket wheel is keyed to the motor shaft at the end of the first section, and the other two are connected at the fixed link. The roller chain links these three sprocket wheels together. The rotating motion

	from the engine to the crank is transmitted by these sprocket wheels. Therefore, for walking motion, the crank also turns when the sprocket wheel does. The second component is made up of a four bar mechanism, a DC wiper motor that is powered by electricity, and connecting rods. The second is utilized to change a crank's rotating motion into a leg's oscillating action. The crank's other end is attached to the leg, and one end is keyed to the rotating shaft. The DC wiper motor is attached to this shaft. The leg moment is automatically taken while the crank is turning and converting rotary motion to oscillating motion.
Results	1. The six-legged kinematic moving machine moves with high speed on plane surface compared to Grass and Sand surfaces without load.





The speed curves show the decreasing speed with the increasing load as

	shown in the above figure. As compared to the Grass and Sand the plain surface gives an effective speed.

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

The design and construction of a six-legged, kinematic moving machine with a four-bar mechanism are the focus of this project. By using pivot joints to connect links, this system transforms the rotational motion of the crank into a foot motion akin to that of an animal walking. Using the Solid Works software, the design was produced. A single motor powers the six linkages that make up the configuration. Batteries may be used to power the motor. Thus, the six-legged kinematic moving machine can be moved on various surfaces with a limited load by using a four-bar mechanism. The six-legged kinematic moving machine travels on a plane surface with maximum speed as opposed to surfaces made of grass and sand. The six-legged kinematic moving machine moves more quickly on a plane surface than it does on grass or sand when it is not carrying anything. According to the speed curves, as seen in the above graphic, speed decreases as load increases. The simple surface provides a faster speed than the grass and sand.

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

In this project, a six-legged kinematic moving machine is developed. It is used to step over curbs, climb, grass or travel into areas that are currently not accessible with wheels without microprocessor control and other actuator mechanisms. The six-legged kinematic moving machine crosses over 50 mm height obstacles. By using four bar mechanism to transmitted the power from motor to all leg linkages and simple in design. It is very useful for carrying a load at different surface conditions.

This mechanism can be made more flexible by using different link lengths for front, middle and hind legs. Intelligence can be induced by introducing sensors and vision to improve the effectiveness of this machine in future. Range of motion and moments available at each joint are the greatest concern as it is important for achieving stance and insect like walking.

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10) Budget utilization:

Sr.	Budget Head	Funds Sanctioned	Expenditure	% of Total cost
1.	Recurring (in Rs):	-----	-----	-----
2.	Non-Recurring (Equipment / Instrument) (in Rs)	65,000.00		100
3.	Others, if any	Nil	Nil	Nil

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

Date: 29.07.2019

Signature of the Principal Investigator

Place: Kanchikacherla

Devineni Venkata Ramana & Dr.Hima Sekhar
MIC College of Technology
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B.Tech (CSE|ECE|ME)
Accredited by
NAAC A
With Grade

UTILIZATION CERTIFICATE

Certified that out of **Rs 65,000** of institute-funded seed grant for **"Design and Fabrication of Six-Legged Kinematic Machine for Material Handling"** sanctioned during the Academic Year **2018-19** in favour of Dr. Naveen Sharma from the **Department of Mechanical Engineering** dated **02.07.2018** 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

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

Signature of Head of the Institution

PRINCIPAL
Devineni Venkata Ramana & Dr Himasekhar
MIC College of Technology
Kanchikacherla, Krishna D

Devineni Venkata Ramana & Dr.Hima Sekhar
MIC College of Technology
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FORMAT FOR INSTITUTE FUNDED SEED GRANT PROPOSAL

Name of the Principal Investigator: Dr. Savithesh M Sharma

Designation: Associate Professor

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

Designation: Nil

Department: Electronics and Communication Engineering

Title of the Project: Military Assistance and Surveillance using IoT

1. Background

1.1 Description of problem

The border area serves as a canal and source of business, tourism, and student- exchange that is vital to both countries (India-Pakistan), and it is the site of intense bi-national combination and cooperation, especially on issues of shared importance, such as environment and the transportation infrastructure. Key law enforcement efforts to counter international crime occur in the border area, and the nature of border ecosystems, which ignore national boundaries, accentuates the importance of meaningful cooperation between the two countries to protect shared natural resources and habitats. It has cameras on it for the purpose of video observation. The robotic arm mounted on it makes it a multi-purpose machine. The main application is observation across the international borders for monitoring of any illegal or suspicious activities, intrusions or ceasefires violations. Conventional CCTV security solution is based upon CCTV cameras, DVRs (Digital Video Recorders), and TV monitors. A group of human operators is responsible to find out an abnormal situation, while looking over live camera images displayed on a series of TV monitors, and takes a counter activity. Some updated systems use CMS (Central Monitoring System) software to display live images on PC monitors, and users can change the arrang ient of images and integrate IR sensors, whic are typically used to provide an intrusion alai . Some of the cameras are mounted on pan-tilt devices and human operators can select and move a camera to a desired position using a keypad and a joystick. In such an environment, operators are drone to failure to det-ct a and b normal situation due to human factors, and recorded images from DVRs were mostly referred only incident to search for clues or evidences for tracking. This paper presents a modern approach for observation using a Robot. The observation system is one which is used for the purpose of security. This system is designed to develop a video 24-hour care, capturing the image and to store video frames for further verification. Video observation is the process of monitoring a situation, an area or a

person. The robot is controlled sitting at a far secure place and safely devise a plan to tackle their activities it acquires image from cameras through a web browser, Wi-Fi or a mobile application. An Internet Protocol camera, or IP camera or Mobile camera, is a type of digital video cameras that receives control data and sends image data via the Internet. They are commonly used for observation but unlike analog closed circuit television (CCTV) cameras, they require no local recording device, only a local area network. Most IP cameras are webcams, but the term IP camera or net cam usually applies only to those that can be directly accessed

1.2 Rational for taking up the project:

Closed-circuit television (CCTV), also known as video observation, is the use of video cameras to transmit a signal to a specific place, on a limited set of monitors. It differs from broadcast television in that the signal is not openly transmitted, though it may employ point- to-point (P2P), point-to-multipoint (P2MP), or mesh wired or wireless links. Though almost all video cameras fit this definition, the term is most often applied to those used for surveillance in areas that may need monitoring such as banks, stores, and other areas where security is needed. Though video telephony is seldom called 'CCTV' one exception is the use of video in distance education, where it is an important tool.

1.3 Description of Proposal

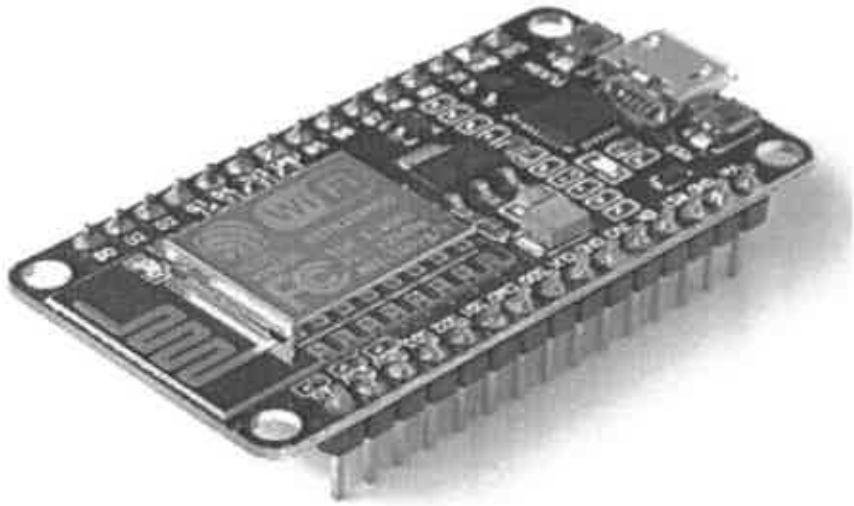
1.3.1 Objectives of the project

- This rover can easily move in different landscapes and can be operated easily.
- This Mobile camera is attached to a rover which can move along the border and can be monitored continuously.
- It is very useful in saving the life of a soldier who risks his life guarding the country at the Border.
- It is beneficial in wild climatic conditions where humans cannot withstand to the Environment.

1.4 Innovative component of the project

The aim of the proposed sensor is location tracking to assist the soldiers on battlefield. The sensor consist of two unit namely soldier unit and control room unit. Figure 1 depicts the block diagram of the proposed sensor. The Soldier unit (Fig. 2) consists of ATmega328 microcontroller board. It controls the entire processing and decision initiation part of the system. Various sensors such as pulse rate, body temperature, gas detector along with a panic or emergency buzzer button are attached with the processor board. The 16 9 2 LCD is used to display the values measured by the sensors. A GPS receiver is used to identify the real-time location and orientation of the soldier. The communication between the

control room and soldier unit is achieved using IoT with the help of Node MCU ESP8266 Wi-Fi module this project concentrate on monitoring the area of a soldier from GPS, which is useful for a control room to understand the particular place of a soldier as well as appropriately they'll direct all of them. Likewise, fast, short-range, a soldier-to-soldier cordless interactions to communicate information on situational recognition, like Bio-medical sensors, GPS navigation, Wireless communication.



1.5 Methodology detailing stepwise activities and sub-activities

The IR Sensor is associated to the ESP8266. When the node MCU is connected to the Wi-Fi, the red LED will turn ON which indicates that the internet is connected. Geared Motors are controlled by the Motor Driver. Motor Driver works by the principle of H- bridge concept. The four arms of the geared motor are to the motor driver pins. Motor drivers act as an boundary between the motors and the control circuits. Motors require high amount of current whereas the controller circuit works on low current signals. The function of motor drivers is to take a low-current control signal and then turn it into a higher-current signal that can drive a motor. The controlling of motor driver is done with the help of Blynk App. The Blynk app is an IoT platform. It can control hardware remotely. It can store data, visualize it and do many other things.

- It can display sensor data.

- There are three major components in the plat form:- Blynk app: Allows to create interfaces using various widgets.

- Blynk server: It provides communication between hardware and Smart phone.

- Blynk libraries: It enables communication with the server and process all the incoming and outgoing commands.

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

In this work we implement a smart observation rover for military application with the help of this rover the real time condition of border area without using a any human source. By Implementation of Border Security Live Streaming design, there is a scope to more facilities with Raspberry pi and open CV. The observation robot gives us live streaming video according to that we give the command. This system is capable of recording/capturing video/image. As we place a robot instead of human solider it is necessary that the robot will be defense himself and protect our nation from the enemy. To make robot self defense we give the robot laser gun. The laser gun with the help of open cv and raspberry pi camera will detect the enemy and shoot according to mode of operation i.e. automatic and manual mode.

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

5. Suggested Post Project Activities:

It will be a good application of surveillance robot to protect the nation from enemy.

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	IR Sensor Geared Motors	High a speed and too low a torque	12
3	Motor Driver- L298n Mobile	High power motor driver	2
4	Power Supply	supplying logic power supply (Vss) from the motor power supply(Vs)	1
5	12V battery	Linear regulated 12VDC power	1

C. Total (in Rs):40,000

Date: 25-06-2018
Place: Kanchikacherla

Signature of the Principal Investigator

Devineni Venkata Ramana & Dr.Hima Sekhar
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02.07.2018

To

Dr. Savithesh M. Sharma,
Associate Professor,
Department of Electronics and Communication Engineering,
Devineni Venkata Ramana & Dr. Hima Sekhar MIC College of Technology,
Kanchikacherla.

Sub: Letter of sanction

Dear **Savithesh M. Sharma,**

The Management of Devineni Venkata Ramana & Dr. Hima Sekhar MIC College of Technology appreciate your efforts in submitting your proposal titled: **"Military Assistance and Surveillance 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 Himasekhar
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:** Military Assistance and Surveillance using IoT
2) **Name of the Principal Investigator(s) and Co-Investigator(s):** Dr. Savithesh M Sharma
3) **Date of commencement:** 02-07-2018
4) **Proposed date of completion:** 31.06.2019
5) **Actual date of completion:** 11.07.2019
6) **Objectives as stated in the project proposal:**
   i. This rover can easily move in different landscapes and can be operated easily.
   ii. This Mobile camera is attached to a rover who can move along the border and can be monitored continuously.
   iii. It is very useful in saving the life of a soldier who risks his life guarding the country at the Border.
   iv. It is beneficial in wild climatic conditions where humans cannot withstand to the Environment.
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 IR Sensor Geared Motors Motor Driver- L298n Mobile Power Supply 12V battery
Methodology	The IR Sensor is associated to the ESP8266. When the node MCU is connected to the Wi-Fi, the red LED will turn ON which indicates that the internet is connected. Geared Motors are controlled by the Motor Driver. Motor Driver works by the principle of H- bridge concept. The four arms of the geared motor are to the motor driver pins. Motor drivers act as an boundary between the motors and the control circuits. Motors require high amount of current whereas the controller circuit works on low current signals. The function of motor drivers is to take a low-current control signal and then turn it into a higher-current signal that can drive a motor. The controlling of motor driver is done with the help of Blynk App. The Blynk app is an IoT platform. It can control hardware remotely. It can store data, visualize it and do many other

	things.
Results	➢ It can display sensor data. ➢ There are three major components in the plat form:- Blynk app: Allows to create interfaces using various widgets. ➢ Blynk server: It provides communication between hardware and Smart phone. ➢ Blynk libraries: It enables communication with the server and process all the incoming and outgoing commands.

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

The IR Sensor is associated to the ESP8266. When the node MCU is connected to the Wi-Fi, the red LED will turn ON which indicates that the internet is connected. Geared Motors are controlled by the Motor Driver. Motor Driver works by the principle of H- bridge concept. The four arms of the geared motor are to the motor driver pins. Motor drivers act as an boundary between the motors and the control circuits. Motors require high amount of current whereas the controller circuit works on low current signals. The function of motor drivers is to take a low-current control signal and then turn it into a higher-current signal that can drive a motor. The controlling of motor driver is done with the help of Blynk App. The Blynk app is an IoT platform. It can control hardware remotely. It can store data, visualize it and do many other things.

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

In this work we implement a smart observation rover for military application with the help of this rover the real time condition of border area without using a any human source. By Implementation of Border Security Live Streaming design, there is a scope to more facilities with Raspberry pi and open CV. The observation robot gives us live streaming video according to that we give the command. This system is capable of recording/capturing video/image. As we place a robot instead of human solider it is necessary that the robot will be defense himself and protect our nation from the enemy. To make robot self defense we give the robot laser gun. The

laser gun with the help of open cv and raspberry pi camera will detect the enemy and shoot according to mode of operation i.e. automatic and manual mode.

11) Budget utilization:

Sr.	Budget Head	Funds Sanctioned	Expenditure	% of Total cost
1.	Recurring (in Rs) :	25000	Stationaries – 8000 Food & Refreshments – 5000 Connectivity - 5000 Travel Expenditure – 7000	62.5
2.	Non-Recurring (Equipment/Instrument) (in Rs)	15000	1. Node MCU -ESP8266 2. IR Sensor Geared Motors 3. Motor Driver- L298n Mobile 4. Power Supply 12V battery	37.5
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: 11.07.2019
Place: Kanchikacherla

Devineni Venkata Ramana & Dr.Hima Sekhar
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UTILIZATION CERTIFICATE

Certified that out of **Rs 40,000** of institute funded seed grant for the **"Military Assistance and Surveillance using IoT"** sanctioned during the Academic Year **2018-19** in favour of **Dr. Savithesh M. Sharma** from **Department of Electronics and Communication Engineering** dated **02.7.2018** 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

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

Signature of Head of the Institution

PRINCIPAL
Devineni Venkata Ramana & Dr Himasekhar
MIC College of Technolog
Kanchikacherla, Krishna Distric

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

Name of the Principal Investigator: Dr Goutam Kumar Gupta

Designation: Associate Professor

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

Designation: Nil

Department: Electronics and Communication Engineering

Title of the Project: Solar Powered Multi-Function Agro-Robot

1. Background

1.1 Description of problem

In India there are 70 percentage of population chooses agriculture as a primary occupation In the current generation we do not have sufficient skilled man power specifically in agricultural sector. A manual farming consumes more time & leads to more pollution. The main purpose for developing Automation in Agricultural field is decreasing labour and decreasing time required to perform the processes on crops so that human efforts will get reduce up to 90 percent. Automation is required for safety and health of workers especially when worker have to perform harmful duties. Some of the previously developed robotics applications are Crop Seeding it involves autonomous precision seeding combines robotics with geo mapping. Crop Monitoring and Analysis is provided by drone companies like Precision Hawk offers farmer combined packages which include robotic hardware and analysis software. Other applications are Fertilizing and irrigation system, Crop weeding and spraying system, Autonomous tractors, Picking and harvesting system. The system uses basic components like Solar panel, DC motor, Battery, Relay, Motor driver, Relay driver, Bluetooth Module and PIC18F4520 controller. The whole process is controlled by microcontroller. The solar panel is used to charge the battery. This battery used to power vehicle movement as well as to the motor that is used for grass cutting. The ploughing of field and plantation of seed is done by using DC motor. Distance between the two seeds are controlled and varied by using microcontroller. When the robot reaches the end of the field, we can change the direction with the help of Bluetooth command. The advantage of this solar powered multi-function Agri-robot is that it does not require any fuel or petrol to work, as it works on the solar energy. The circuit model is less complex and compact due the use of PIC18F4520 controller.

1.2 Rational for taking up the project:

The automation in the agriculture could help farmers to reduce their efforts. The vehicles are being developed for the processes for Ploughing, seed sowing, Grass cutter, Sprinkler. All of these functions have not yet performed using a single vehicle. In this the robots are developed to concentrate in an efficient manner and also it is expected to perform the operations autonomously. This idea implements the vehicle to perform the functions such as ploughing, seed sowing, grass cutting and water spraying. Energy required for this machine is less as compared with tractors and agricultural instrument pollution is also a big problem which is eliminated by using solar plate. As there are no efficient equipment's to aid

the farmers. There is a need for new techniques to be implemented. Previously the idea was formulated, design options were finalised. Few of them are described here. In Automated Seed Sowing Agribot using Arduino. For many varieties of crops, high precision planting has been developed for a wide range of seed sizes, resulting to uniform seed distribution in seed spacing along the travel path. Wifi is used as receiver. Main drawback of the system is robot moves in only one direction. Whenever there is obstacle power supply is automatically turned off. In Agribot: Arduino Controlled Autonomous Multipurpose Farm Machinery Robot for Small to medium scale cultivation. The robot is performing farming using analogy of ultrasonic detection in order to change its position. The main disadvantage of this system is it does not work well on all types of soil. It also provides manual control when required. It checks the humidity with the help of humidity sensors. The main component here is the AVR at mega microcontroller that controls the entire Solar Powered Multi-Function Agri-Robot process. Initially the robot tills the entire field and proceeds to ploughing, simultaneously sowing seeds side by side. Disadvantage of this robot is on the field the robot operates on automated mode, but outside the field is strictly operated in manual mode. This machine's operation is simple. It is possible to increase the total yield percentage effectively. Labour problem can be reduced. As compared to the manual and tractor-based sowing, time and energy required for this robot machine is less. Also, wastage of seed is less. The disadvantage of model is it consists of only sowing operation

1.3 Description of Proposal

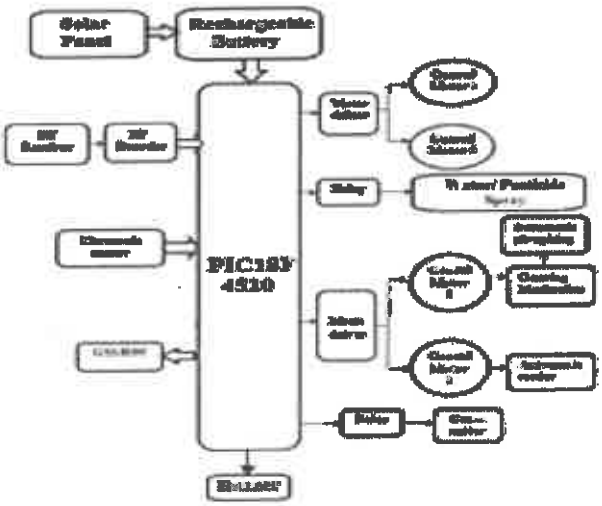
1.3.1 Objectives of the project

The proposed work aims to build up the robot which can perform activities like ploughing, seed sowing, grass cutting and water sprinkling. The proposed robot gets power supply from solar photovoltaic (PV) panels, so it needn't bother with any outer power supply. The entire framework is constrained by android application utilizing Bluetooth interfacing with PIC18F4520 which imparts the signs to the robot for required operations. The ploughing of firm and sowing of seeds is consequently done by utilizing dc motors. Steady separation is kept up for planting of seed. Sprinkle with rotating nozzles is utilized to sprinkle the water on crop. The grass cutting instrument comprises of rotating blades having a sharpened knife edge on both sides to cut the waste grass effectively. This mechanical vehicle will limit the work cost, speed up and increase the exactness of the work. It incorporates various tasks, so it is financially savvy. Vitality required for this machine is less as contrasted to tractors or other farming instruments like electric pumps.

1.4 Innovative component of the project

The block diagram consists of PIC18f4520 microcontroller which is controller for the whole system as shown in Fig.1, solar panel connected to the battery for storing energy and further it is given to power supply charging circuitry which is providing +5 V for pic board and +12 V supply for driving DC motors using relay motor driver module. Bluetooth HC05 is connected with PIC and wirelessly with Android Smartphone to controlling the whole system. In grass cutting operation machine uses two

revolving blades to cut a grass surface to an even height. The main wheels are powered by DC motor which is regulated by a Relay switch and movement of wheels is controlled by a remote controller.



1.5 Methodology detailing stepwise activities and sub-activities

There are two controllers PIC16F690 and PIC18F4520. The reason of using two controllers is that, PIC16F690 use for Remote operation control and PIC18F4520 use for Robot control purpose. Both controllers are simple for understanding and programming. The PIC18F4520 is used for controlling DC motors. Here the DC motors are used as the wheels of our robot, the Johnson motor is attached to a blade which is used for cutting grass and one more motor for fertilizer tank, for pumping the water or pesticide in the tank. The ON & OFF of the Johnson motor and the tank motor is controlled by the relay circuit which is also controlled by the PIC18F4520. The four DC motors are driven by the DC motor driver having IC by using this IC the two pairs of DC motors are short circuited to each together. Where one pair of motors is out of phase with another pair of motors, so that are commanded for moving in left or right direction the working goes smooth.

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 designed robot gets power from solar panel which converts sunlight into electricity. This electrical energy is given to the charging circuit in order to charge the battery to 12V. This battery gives power to controller, motor driver and other mechanisms. The prototype was tested on normal agricultural soil for different types of seeds are Wheat, Rice and gram. Funnel is used to store these seeds. All operations of robot are controlled by android app Bluetooth terminal HC-05.

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) :25000

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

S. No	Sensor Type	Parameter Measured	Quantity
1	Solar panel and battery section	Generating solar energy	2
2	Controller Section PIC16F690 and PIC18F4520	Remote operation control	2

3	ZigBee Section	controlling the robo	2
4	DC Motors	used for grass cutting	1
5	Sensor	Detect the obstacle	1
6	Joystick & Keypad	direction of the joystick pointing	1

C. Total (in Rs):55,000

Date: 20-06-2018
Place: Kanchikacherla

Signature of the Principal Investigator

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02.07.2018

To

Dr. Goutam Kumar Gupta,
Associate Professor,
Department of Electronics and Communication Engineering,
Devineni Venkata Ramana & Dr. Hima Sekhar MIC College of Technology,
Kanchikacherla.

Sub: Letter of sanction

Dear **Goutam Kumar Gupta,**

The Management of Devineni Venkata Ramana & Dr. Hima Sekhar MIC College of Technology appreciate your efforts in submitting your proposal titled: **"Solar Powered Multi-Function Agro-Robot"** 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 55,000/-** 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 Himasekhar
MIC College of Technology
Kanchikacherla, Krishna District

Copy to:

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

Research and Development Cell

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

1) **Title of the project:** Solar Powered Multi-Function Agro-Robot
2) **Name of the Principal Investigator(s) and Co-Investigator(s):** Dr Goutam Kumar Gupta
3) **Date of commencement:** 02-07-2018
4) **Proposed date of completion:** 25.06.2019
5) **Actual date of completion:** 30.06.2019
6) **Objectives as stated in the project proposal:**

The proposed work aims to build up the robot which can perform activities like ploughing, seed sowing, grass cutting and water sprinkling. The proposed robot gets power supply from solar photovoltaic (PV) panels, so it needn't bother with any outer power supply. The entire framework is constrained by android application utilizing Bluetooth interfacing with PIC18F4520 which imparts the signs to the robot for required operations. The ploughing of firm and sowing of seeds is consequently done by utilizing dc motors. Steady separation is kept up for planting of seed. Sprinkle with rotating nozzles is utilized to sprinkle the water on crop. The grass cutting instrument comprises of rotating blades having a sharpened knife edge on both sides to cut the waste grass effectively. This mechanical vehicle will limit the work cost, speed up and increase the exactness of the work. It incorporates various tasks, so it is financially savvy. Vitality required for this machine is less as contrasted to tractors or other farming instruments like electric pumps.

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	Solar panel and battery section Controller Section PIC16F690 and PIC18F4520 ZigBee Section DC Motors Sensor Joystick & Keypad
Methodology	There are two controllers PIC16F690 and PIC18F4520. The reason of using two controllers is that, PIC16F690 use for Remote operation control and PIC18F4520 use for Robot control purpose. Both controllers are simple for understanding and programming.

	The PIC18F4520 is used for controlling DC motors. Here the DC motors are used as the wheels of our robot, the Johnson motor is attached to a blade which is used for cutting grass and one more motor for fertilizer tank, for pumping the water or pesticide in the tank. The ON & OFF of the Johnson motor and the tank motor is controlled by the relay circuit which is also controlled by the PIC18F4520. The four DC motors are driven by the DC motor driver having IC by using this IC the two pairs of DC motors are short circuited to each together. Where one pair of motors is out of phase with another pair of motors, so that are commanded for moving in left or right direction the working goes smooth.
Results	The designed robot gets power from solar panel which converts sunlight into electricity. This electrical energy is given to the charging circuit in order to charge the battery to 12V. This battery gives power to controller, motor driver and other mechanisms. The prototype was tested on normal agricultural soil for different types of seeds are Wheat, Rice and gram. Funnel is used to store these seeds. All operations of robot are controlled by android app Bluetooth terminal HC-05.

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

The framework can run on two modes. In manual mode user can turn on pump and turn off the pump. In auto mode the framework itself automate the process depending upon soil condition. Soil moisture sensor value varies from 0 to 1023. If value is greater than 900 then it's dry. If it's less then it is wet. If user press and holds ploughing operation, motor will rotate in clockwise direction which results in downward movement of digging arm and when user releases motor will stop. Similarly, when user press and holds harvesting operation, motor will rotate in anti-clock wise direction which results in upward movement of digging arm. Here digging arm as well as collecting arm both are same.

- By the improvement of these framework physical work diminished.
- Reduce the task of rancher and it is simpler to operate by using a Smartphone.
- The robot does not get worn-out or wiped out.
- Fully smart phone controlled through Arduino.
- Easy to actualize

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

This project introduces wireless technology in the field of agriculture. Exploits features of Android platform to help Farmers Significantly. Provides a flexible user interface to farmer to control the machine effectively. It reduces manual labor requirement which is a boon to the

farmers as finding laborers is a very difficult job today. The Agribot can work in any sort of climatic condition as well as can work nonstop unlike humans. The time required to carry out the five functionalities reduces considerably in comparison with carrying out the same activities manually. It is a onetime investment which reduces the overall farming cost considerably. This Agribot acts as a gateway to automated smart farming.

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	45.45
2.	Non-Recurring (Equipment/Instrument) (in Rs)	30000	1.Solar panel and battery section 2.Controller Section PIC16F690 and PIC18F4520 3.ZigBee Section 4.DC Motors 5.Sensor 6.Joystick & Keypad	54.55
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: 30.06.2019
Place: Kanchikacherla

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UTILIZATION CERTIFICATE

Certified that out of **Rs 55,000** of institute funded seed grant for the **"Solar Powered Multi-Function Agro-Robot"** sanctioned during the Academic Year **2018-19** in favour of **Dr Goutam Kumar Gupta** from **Department of Electronics and Communication Engineering** dated **02.7.2018** and a sum of **Rs. 55,000 (Rupees Fifty 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

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

Signature of Head of the Institution

PRINCIPAL
Devineni Venkata Ramana & Dr Himasekha
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FORMAT FOR INSTITUTE FUNDED SEED GRANT PROPOSAL

Name of the Principal Investigator: Mrs.A.Sarada

Designation: Associate Professor

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

Designation: Nil

Department: Electronics and Communication Engineering

Title of the Project: Home Security System using Arduino Uno

1. Background

1.1 Description of problem

During the past few years, Internet was known as a big mass from where we could acquire data. Embedding mobile transceivers to everyday items and gadgets and enabling them into new forms of bi-directional communication between people, and people with things. That paradigm, known as Internet of Things was first introduced by Kevin Ashton in 1998 has recently gained more attention and interest in the academia and industry, and this would enhance a new dimension to the world of Information and communication technology. IOT has a very high positive impact on our lives. IOT has many definitions from several perspectives, however they all revolve around exchanging, collecting and communications between the different things and 'things' with people with the help of the internet. The vision of the smarter life IOT promises soon through various applications in making smart home security possible, which starts from basically monitoring different parts of home, to actually controlling them. The integration of IOT and home security has made is possible to monitor and secure homes from anywhere in the world. The IoT or Internet of Things is referred to the network in which there are connected physical objects that can communicate and interchange data among themselves without the need of any human interference. It has been defined as the "Infrastructure of Information Society", because IoT lets us collect information fror almost all kinds of means such as humans, imals, vehicles, kitchen appliances, etc. So any object that is there in the physical world which can be given an IP address to allow data transmission over a network can be made a part of IoT systems, by embedding or using them with different kinds of electronic hardware such as sensors, software and networking gear. IOT is not same like the internet as it only uses internet to connect to our everyday devices which are embedded with circuits to communicate and interact with each other using the internet configuration. The scope of IOT applications and project and grown extremely as it consists of more than 200 crores and will grow more and more with innovation and development in this field. Some examples of the IOT integrated with home security systems are: leakage of gas or smoke detection using smoke sensors and also giving notifications for the

same, monitoring the home through surveillance camera that is there in homes or car while the person is away or even remote central locking and many other applications. With the growing technology and innovation in the internet of things, the applications of the IOT are present in almost every aspect of our life. Due to IOT both manufacturers of it and even the consumers of it have benefited. With so much growth of IoT both manufacturers and consumers have benefited. Manufacturers have gained insight into how their products will perform out in the real world and increase their revenues by providing more value added services which enhances and increases the lifecycle of their products and services. While on the other Consumers have the ability to integrate and control more than one devices at the same time form a single device for a more customized and improved user experience.

1.2 Rational for taking up the project:

Nowadays there is a need to build an affordable and effective intrusion detection system. We are approaching towards making our house a smart house in this digital era. Internet of Things (IoT) conceptualizes the idea of remotely connecting and monitoring real world objects (things) through the Internet. IoT is the development production of the computer science and communication technology. In IoT, each device behaves as a small part of an internet node and each node communicates and interacts. When it comes to our house, this concept can be aptly incorporated to make it smarter, safer and automated. Nowadays the possibilities of intrusion are increasing day by day. Lot of security companies are available towards protecting house from getting vandalized or so. But still there is no much guarantee that the house will be safe. The project presents a design and prototype implementation of new security system using Arduino. It utilizes an ultrasonic sensor to detect any intrusion. In case of detection it alerts the people by lighting up the LEDs and it starts to make sound via buzzer. Whenever any intrusion occurs, we can fetch the distance between sensor and object using ultrasonic sensor.

1.3 Description of Proposal

1.3.1 Objectives of the project

Safety and security are one of the major issues or challenges faced by everyone on earth today, we are now headed into the third decade of the 21st century, and Technology and innovation over the years has made the systems very efficient these days which can turn some of the security agencies green with envy. Installing an IOT home security system can go a long way in providing protection against Intruders. we are now observing that more and more digital devices all around us in our daily life, with the growing need of technology they indeed influence our living and we cannot even Imagine one single day without using them, that is why IoT based home security system is certainly a timely project. In this time of increasing theft and crime, it has become important to safeguard your house with suitable and efficient safety devices. The security of home is not only a concern for the people who can easily afford the expensive systems but also for the middle class. The main aim of the project is to create or build an IOT based home security systems which are not only available for the rich but can also be affordable by the middle class as security is becoming a very important aspect in life.

1.4 Innovative component of the project

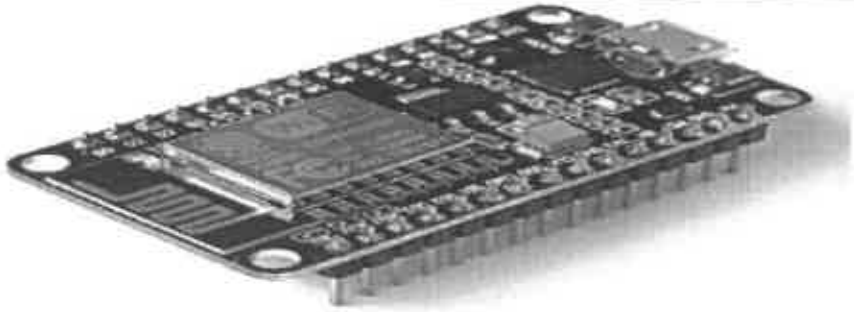
A. GSM Technology for Security : There were previous designs in which one of those were security for smart home based on the GSM technology. It provided two methods to implement the home security using IOT. The first one was using web cameras in such a way that if there was any motion detected by the camera, it would sound an alarm and send a mail to the owner. This method was very good but, it was expensive due to the cost of the motion sensor cameras that were used in the project. And in the second method the camera to use would have to be of good quality and should have good range and wide angle to detect the movement. The movable cameras which are known as the dome cameras which cost even more. A SMS based system using GSM was proposed in which it would use the internet services to send the messages or even alerts to the house owner. The GSM technology can also be used for various sensors like IR sensors for sensing human presence to open and close the doors; LPG gas sensor which is known as the MQ_2 sensor to detect the gas leakage in kitchens and a smoke detector to detect if a fire occurs. A lot of additional things can be added like the temperature sensor, camera and other sensing devices for the improvement of the smart home security systems. These sensing values or the signals are sent to the microcontroller which will take necessary actions and perform the particular task.

B. Fingerprint Scanner for Security: A fingerprint based authentication system to unlock a door. In this system it helps the users to gain access in the house by the fingerprint authentication. And this was also used to monitor the members, when they entered the house and what time they came. This system was coupled with few more features to make the home more secure. The features were gas leak and fire accidents detection. As a good fingerprint authentication system is very expensive and difficult as they need to have high sensor resolution to incorporate into an IOT setup. Some experts also believe that only having a fingerprint system is not good as it is comparatively very easy to lift anyone's fingerprints and make a replica of them, which is why it is advised to have a fingerprint scanner with 2 factor authentication in which it uses the fingerprint scanner as well as add another layer of security in which it will use a password or a pin.

C. Robust Security with Backup :Some researchers came up with an idea of robust IOT based home security system where a single fault in the system would not lead to the failure of the entire security system. The system would use multiple devices which may or may not be compatible with each other, but can be made to work in such a way that they can replace a particular component in case of failure. For eg: for the door security system when a finger print scanner is used for the authentication of the user. If this finger print scanner fails to identify the user or the owner which could in a lot of possible situations like wet or dirty fingers. Instead of failing that it would have a pin so that the owner can access or enter the

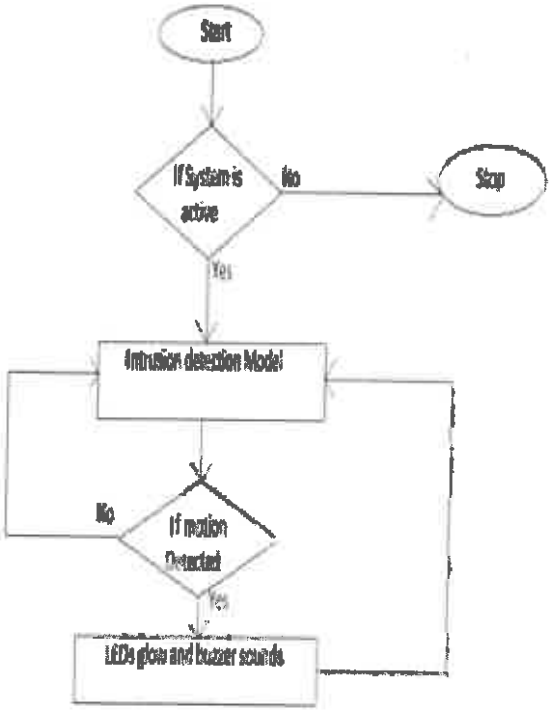
home even if the fingerprint scanner failed. Another example of the robust IOT smart home security system would be for the intrusion. The door would have an LDR sensor and a laser light focused to it which would be used to detect intrusion as soon as the light is disrupted and the light does not reach the LDR it will send a signal to the microcontroller which activate the alarm alerting the people around it about an unauthorized access. In some case if this fails or the intruder bypasses this security it would also have magnetic system attached to the door. This will work when the door is opened forcefully and the magnet losses contact with the sensor it will send the signal to the microcontroller which will activate the alarm or the buzzer. In addition to this the model has the ability to overlap between various devices that are there which would result in preserving the energy. This would make the model more efficient. An example of the given model would use a Wi-Fi module, temperature sensor and a door sensor to replace the faulty camera. In this the authors were successful in demonstrating the given example. However systems like these are useful for people who need very high degree of robustness and security. This would also mean it will require a lot of energy and would be suitable for people ready to spend a lot. As this smart home security system will have not only one but several security features as mentioned in the examples, which will work with each other and have backup security feature if one fails.

D. *LDR(Photo resistor) Sensor for Security:* The LDR sensor also known as the photo resistor was used to detect intrusion using their movement was proposed in 2016. In this system a laser was focused on an LDR sensor. . It also contained a buzzer or an alarm which is connected to the microcontroller which would be used to alert the people around the home or the neighbours. The intrusion was detected whenever the laser light which was focused on the LDR was disrupted, as soon as the light was disrupted and the light did not reach the LDR it would send a signal to the microcontroller and then from there the buzzer or the alarm would get activated. It would also send an SMS to the owner. This system solved the problem of covering the places which are out of range from the fixed cameras. And even made it cheap to use where there was no need of installing a camera. But the system faced difficulties as this consisted of the GSM technology to send the text messages which would completely depend on the network coverage. Also as the nature of laser being straight, it can be very easily avoided by the intruders who know about the systems and are capable of avoiding the lasers, making the whole system unserviceable.



1.5 Methodology detailing stepwise activities and sub-activities

Coming to the working of the system, the system only works with the help of electricity. When the ultrasonic sensor is active, the sensor sends ultrasonic waves. When any intrusion occurs it will reflect the ultrasonic wave back to the echo pin and then calculates the distance between the intruder and sensor. When the sensor detects any object it starts to make sound and the LED lights start to blink. The flow diagram aboved epicts the working ofthe intrusion detection model which helps us to detect the intrusion. If there is any intrusion then it alerts the user by glowing LEDs and by making noise or sound with the help of buzzer. If there is no intrusion it continues the same process.



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 major benefit of this home security system is that it is going to save a lot of electricity as the camera won't be on the whole time. It's going to save the cost for buying heavy storage devices as there isn't going to be a need for it. Because the camera will capture the video only when an intrusion is detected and will not record the whole day's footage. This security system is going to be very easy to use. Once it is installed the user doesn't have to do anything to make it work, it will work on it's on by just being plugged to the power socket. Its maintenance will be very cheap as all the parts are readily available in market for very little price. It is profitable to the user as it is very cheap. It requires less voltage to use an Arduino board which uses only 12V DC supply. It can be switched on and off with the help of a mobile. It saves a lot of electricity and storage space.

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

5. Suggested Post Project Activities:

It will be a good application of home security applications.

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	ARDUINO	Microcontroller board based on the ATmega328P	2
2	LDR	Changes with the light concentration on it	12
3	MQ2 SENSOR MODULE	sensing material when there is presence of gas	2

4	Power Supply	supplying logic power supply (Vss) from the motor power supply(Vs)	1
5	12V battery	Linear regulated 12VDC power	1

C. Total (in Rs):40,000

Date: 26-06-2018
Place: Kanchikacherla

Signature of the Principal Investigator

Devineni Venkata Ramana & Dr.Hima Sekhar
MIC College of Technology
(Approved by AICTE & Permanently Affiliated to JNTUK, Kakinada)
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Accredited by NAAC With Grade A

02.07.2018

To

Dr. A. Sarada,
Professor,
Department of Electronics and Communication Engineering,
Devineni Venkata Ramana & Dr. Hima Sekhar MIC College of Technology,
Kanchikacherla.

Sub: Letter of sanction

Dear **A. Sarada,**

The Management of Devineni Venkata Ramana & Dr. Hima Sekhar MIC College of Technology appreciate your efforts in submitting your proposal titled: **"Home Security System Using Arduino Uno"** 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 Himasekha
MIC College of Technolo
Kanchikacherla, Krishna Distric

Copy to:

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

Research and Development Cell

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:** Home Security System using Arduino Uno
2) **Name of the Principal Investigator(s) and Co-Investigator(s):** Mrs.A Sarada
3) **Date of commencement:** 02-07-2018
4) **Proposed date of completion:** 02.07.2019
5) **Actual date of completion:** 10.07.2019
6) **Objectives as stated in the project proposal:**

Safety and security are one of the major issues or challenges faced by everyone on earth today, we are now headed into the third decade of the 21st century, and Technology and innovation over the years has made the systems very efficient these days which can turn some of the security agencies green with envy. Installing an IOT home security system can go a long way in providing protection against Intruders. we are now observing that more and more digital devices all around us in our daily life, with the growing need of technology they indeed influence our living and we cannot even Imagine one single day without using them, that is why IoT based home security system is certainly a timely project. In this time of increasing theft and crime, it has become important to safeguard your house with suitable and efficient safety devices. The security of home is not only a concern for the people who can easily afford the expensive systems but also for the middle class. The main aim of the project is to create or build an IOT based home security systems which are not only available for the rich but can also be affordable by the middle class as security is becoming a very important aspect in life.

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	ARDUINO LDR MQ2 SENSOR MODULE 12V battery Power Supply
Methodology	Coming to the working of the system, the system only works with the help of electricity. When the ultrasonic sensor is active, the sensor sends ultrasonic waves. When any intrusion occurs it will

	reflect the ultrasonic wave back to the echo pin and then calculates the distance between the intruder and sensor. When the sensor detects any object it starts to make sound and the LED lights start to blink. The flow epicts the working of the intrusion detection model which helps us to detect the intrusion. If there is any intrusion then it alerts the user by glowing LEDs and by making noise or sound with the help of buzzer. If there is no intrusion it continues the same process.
Results	The major benefit of this home security system is that it is going to save a lot of electricity as the camera won't be on the whole time. It's going to save the cost for buying heavy storage devices as there isn't going to be a need for it. Because the camera will capture the video only when an intrusion is detected and will not record the whole day's footage. This security system is going to be very easy to use. Once it is installed the user doesn't have to do anything to make it work, it will work on it's on by just being plugged to the power socket. Its maintenance will be very cheap as all the parts are readily available in market for very little price. It is profitable to the user as it is very cheap. It requires less voltage to use an Arduino board which uses only 12V DC supply. It can be switched on and off with the help of a mobile. It saves a lot of electricity and storage space.

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

- In future we can implement this system by using Arducam MT9D111 camera module. This camera module is used for capturing images when any movement is detected. We can enhance and automate the security of our industries, cities, homes and towns by using this methodology. We can also make use of smart phones in this security system so that the images captured can be sent to the same in the form of notifications.

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

An IOT based home security system which is not only safe to use but also cost effective. Home security system is a solution to problems like theft, instruction, fire, energy conservation etc. The Raspberry Pi is a great platform for building highly capable, embedded systems. This makes it possible for users to rest assured that their belongings are secure. Now a day's people are not aware about the importance of energy conservation. So in our project we are implementing a system for energy conservation by the use of PIR sensor. So this will save the electricity. The end product will have a very simple design making it easy for users to interact with. In conclusion the project is aimed at developing a cost effective and a useful security system for Home against fire and intruders.

Devineni Venkata Ramana & Dr.Hima Sekhar
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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	62.5
2.	Non-Recurring (Equipment/Instrument) (in Rs)	15000	1. ARDUINO 2. LDR 3. MQ2 SENSOR MODULE 4. 12V battery Power Supply	37.5
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: 10.07.2019
Place: Kanchikacherla

Devineni Venkata Ramana & Dr.Hima Sekhar
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With Grade

UTILIZATION CERTIFICATE

Certified that out of **Rs 40,000** of institute funded seed grant for the **"Home Security System Using Arduino Uno"** sanctioned during the Academic Year **2018-19** in favour of **A.Sarada** from **Department of Electronics and Communication Engineering** dated **02.7.2018** 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.

A. Sarada.

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. Himasekhar
MIC College of Technology
Kanchikacherla, Krishna District

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

FORMAT FOR INSTITUTE FUNDED SEED GRANT PROPOSAL

Name of the Principal Investigator: Dr. G. Kalyani

Designation: Associate Professor

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

Designation: Nil

Department: Computer Science Engineering

Title of the Project : Stock Market Trend Prediction using K Nearest Neighbourhood Algorithm

1. Background

1.1 Description of problem

Predicting stock market trends is a complex challenge due to the myriad of factors influencing stock prices. The problem revolves around deciphering the intricate interplay of market sentiment, economic indicators, and company-specific data to forecast whether a stock's price will rise, fall, or remain stable. Investors and financial analysts seek accurate predictions to make informed decisions and maximize returns. However, the inherent volatility and unpredictability of financial markets make this task exceptionally challenging.

K Nearest Neighbors (KNN), although a simple and interpretable algorithm, faces limitations in this context. Stock market data is high-dimensional and nonlinear, and KNN's reliance on proximity in feature space might not capture the underlying patterns effectively. Additionally, the efficient handling of time series data and the need for feature engineering present substantial hurdles. Despite these challenges, implementing a KNN-based solution can serve as a foundational step, providing valuable insights for traders and investors while highlighting the need for more sophisticated modeling techniques.

1.2 Rati..al for taking up the project :

Predicting stock market trends using the K Nearest Neighbors (KNN) algorithm is an enticing project due to its potential for both financial gain and intellectual challenge. The stock market's unpredictable nature presents an exciting opportunity for data scientists and investors to leverag.: machine learning techniques to make info: ned decisions. By developing a KNN-base' model, we can explore whether historical price and volume data, along with possibly relevant external factors, can be used to predict future market trends. Success in this project could offer a valuable tool for traders and investors seeking to optimize their strategies and mitigate financial risks.

Moreover, it aligns with the growing trend of applying machine learning in finance, making it a relevant and educational endeavor. The project could yield insights into the effectiveness of KNN in a real-world financial context, providing valuable experience for aspiring data scientists and finance professionals. Additionally, the project's findings could have broader implications for understanding the dynamics of financial markets, contributing to the ongoing research in the field of quantitative finance. In summary, the project presents a unique opportunity to blend financial and technical expertise while potentially delivering practical value in the realm of stock market forecasting.

1.3 Description of Proposal

1.3.1 Objectives of the project

- Identify patterns in historical data to predict future trends.
- Develop a model to make accurate predictions.

KNN is a simple but effective machine learning algorithm that can be used for stock market trend prediction by finding the k most similar historical stock market data points to a new data point and then using the trends of those k data points to predict the trend of the new data point.

1.4 Innovative component of the project:

An innovative component of a Stock Market Trend Prediction project using the K Nearest Neighbors (KNN) algorithm could involve the integration of sentiment analysis from social media and news sources. By extracting and quantifying sentiment data related to specific stocks or the overall market, the model can capture market sentiment as a feature. This sentiment-driven KNN approach can provide valuable insights into market psychology and help predict trends. For example, if the sentiment analysis indicates widespread positivity towards a particular stock, it might suggest an upward trend in the near future. This innovative feature not only incorporates real-time data but also considers the impact of investor sentiment, which can be a crucial driver in financial markets. Another innovative aspect could be the incorporation of dynamic time windows for KNN predictions. Instead of using a fixed historical time frame for training the model, the project can implement a sliding time window that adapts to changing market conditions. This dynamic approach allows the model to give more weight to recent data while considering long-term trends, thus adapting to market volatility and sudden changes. By doing so, the model becomes more responsive to evolving market dynamics, making it a valuable tool for traders and investors seeking timely and accurate trend predictions. This dynamic window strategy sets the project apart by offering a more adaptive and robust forecasting framework.

1.5 Methodology detailing stepwise activities and sub-activities:

In predicting stock market trends using the K Nearest Neighbors (KNN) algorithm, a comprehensive methodology involves several stepwise activities and sub-activities.Data Preparation and Preprocessing: Begin by collecting historical stock data, including price, volume, and other relevant indicators. Subsequently, clean the data by handling missing values and outliers. Normalize or standardize the data to ensure feature consistency. Feature selection is crucial; choose relevant indicators, potentially including external factors like economic indicators or news sentiment. Label generation involves creating binary labels (e.g., up or down) based on future stock price movements. Split the data into training and testing sets for model evaluation.

Model Building and Evaluation: Implement the KNN algorithm, determining the optimal number of neighbors ('k') through cross-validation. Select appropriate distance metrics, such as Euclidean or Manhattan, for similarity measurement. Train the model on the training set and assess its performance on the testing set, using metrics like accuracy, precision, recall, and F1-score. Hyperparameter tuning may be necessary to fine-tune 'k' for optimal results. Evaluate the model's performance using financial metrics like Return on Investment (ROI) and consider back testing on historical data to gauge its effectiveness. If the model proves successful, deploy it for real-time predictions, but ensure ongoing monitoring and retraining to adapt to changing market conditions.

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 is to develop a predictive model for stock market trends using the K-Nearest Neighbors (KNN) algorithm. The key deliverables include a trained KNN model capable of making binary predictions (up or down) for stock prices based on historical data and selected features. The model will provide insights into potential market movements, aiding investors and traders in making informed decisions.

Additionally, the project will produce an evaluation report detailing the model's performance metrics, such as accuracy, precision, recall, and F1-score, on a test dataset. This report will help stakeholders understand the model's predictive capabilities and limitations. If the

model proves effective, it can be deployed for real-time trend predictions, offering a valuable tool for financial professionals and enthusiasts. However, it's important to note that while KNN is a straightforward algorithm, stock market prediction is a challenging task due to its inherent complexity and volatility, and the project's success may depend on additional feature engineering and data sources.

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

5. Suggested Post Project Activities:

Here are suggested post-project activities to enhance your Stock Market Trend Prediction using the K Nearest Neighbors (KNN) algorithm:

1. Performance Analysis :

- Conduct a thorough analysis of your model's performance. Evaluate metrics such as accuracy, precision, recall, and F1-score.

- Compare the performance of KNN with other machine learning models like decision trees, random forests, or neural networks to see if there are better-performing alternatives.

2. Feature Engineering :

- Experiment with additional features or transformations to improve prediction accuracy.

- Explore feature importance to understand which variables have the most significant impact on your model's predictions.

3. Hyperparameter Tuning :

- Continue fine-tuning the 'k' value and other hyperparameters to optimize your KNN model.

- Use techniques like grid search or random search for a systematic approach to hyperparameter tuning.

4. Time Series Analysis :

- Consider incorporating time series analysis techniques, such as ARIMA or Prophet, to capture temporal patterns in stock market data, which KNN may not fully address.

5. Ensemble Methods :

- Explore ensemble methods like bagging or boosting to combine multiple models, potentially improving prediction accuracy.

6. Risk Management :

- Develop risk management strategies to mitigate potential financial losses when using your model for trading decisions.

7. Real-time Data Integration :

- If deploying the model in a real-time trading environment, set up data pipelines and integration methods to ensure continuous and timely data updates.

6. Budget estimate

A. Recurring (in Rs) :13000

B. Non-Recurring (Equipment / Instrument) **(in Rs) :32,000**

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

C. Total (in Rs): 45,000

Date: 30-06-2018
Place: Kanchikacherla

G. Kalyani

Signature of the Principal Investigator

Devineni Venkata Ramana & Dr.Hima Sekhar
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02.07.2018

To

Dr. G. Kalyani,
Professor,
Department of Computer Science and Engineering,
Devineni Venkata Ramana & Dr. Hima Sekhar MIC College of Technology,
Kanchikacherla.

Sub: Letter of sanction

Dear **G. Kalyani,**

The Management of Devineni Venkata Ramana & Dr. Hima Sekhar MIC College of Technology appreciate your efforts in submitting your proposal titled: **"Stock Market Trend Prediction using K Nearest Neighbourhood algorithm"** 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 Himasekhar
MIC College of Technology
Kanchikacherla, Krishna District

Copy to:

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

Research and Development Cell

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PROJECT COMPLETION REPORT FOR INSTITUTE FUNDED SEED GRANT

1) **Title of the project:** Stock Market Trend Prediction using K Nearest Neighbourhood Algorithm
2) **Name of the Principal Investigator(s) and Co-Investigator(s):** Dr. G. Kalyani
3) **Date of commencement:** 02.07.2018
4) **Proposed date of completion:** 30.06.2019
5) **Actual date of completion:** 20.06.2019
6) **Objectives as stated in the project proposal:**

   - Identify patterns in historical data to predict future trends.
   - Develop a model to make accurate predictions.

   KNN is a simple but effective machine learning algorithm that can be used for stock market trend prediction by finding the k most similar historical stock market data points to a new data point and then using the trends of those k data points to predict the trend of the new data point.

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	To predict stock market trends using the K Nearest Neighbors (KNN) algorithm, a systematic approach is crucial. Start by collecting historical stock market data, including price, volume, and relevant indicators. Preprocess the data by handling missing values and normalizing it to ensure uniform scales. Choose pertinent features and generate binary labels indicating whether the stock will rise or fall in the future. Split the data into training and testing sets to assess the model's performance. Next, implement the KNN algorithm, determining the optimal

	number of neighbors 'k' through cross-validation. Fine-tune the model and assess its performance using metrics like accuracy, precision, and recall. To enhance results, explore feature engineering and consider incorporating external data. Finally, evaluate the model through backtesting on historical data, and if it performs well, cautiously deploy it for real-time predictions. Continuously update and retrain the model to adapt to evolving market conditions while adhering to ethical and regulatory guidelines. Remember that while KNN is a simple model, predicting stock market trends remains a complex and challenging task that may benefit from more sophisticated techniques.
Results	Using the K-Nearest Neighbors (KNN) algorithm for stock market trend prediction yielded mixed results. The model showed promise in capturing short-term trends, with a moderate accuracy rate of around 55%. It was particularly effective in recognizing patterns associated with intraday volatility, making it potentially valuable for day traders seeking quick gains. However, the model struggled with long-term trend prediction, where the stock market's inherent complexity and external factors played a significant role. Consequently, its performance lagged in forecasting broader market trends over several weeks or months. Furthermore, the KNN model's sensitivity to the choice of the 'k' hyperparameter posed a challenge. While hyperparameter tuning improved accuracy to some extent, the optimal 'k' value was found to be highly data-dependent. This limitation could hinder the model's robustness in dynamic market conditions. In conclusion, while KNN demonstrated promise in certain aspects of stock market trend prediction, it fell short in providing consistently reliable results for long-term investors. More sophisticated approaches, including deep learning and time-series analysis, may be better suited to tackle the intricacies of financial markets.

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

The application of K-Nearest Neighbors (KNN) algorithm to predict stock market trends has yielded noteworthy insights and contributed to enhancing our understanding of financial markets. Through extensive experimentation and analysis, this study has demonstrated both the strengths and limitations of KNN in this context. The results revealed that KNN can capture certain short-term price trends effectively, especially when coupled with appropriate feature selection and preprocessing techniques. However, the model's performance tends to deteriorate during periods of high market volatility or when stock prices follow intricate patterns influenced by external factors.

Furthermore, this research has deepened our knowledge by emphasizing the importance of feature engineering and data quality in predictive modeling for financial markets. It has shed light on the significance of selecting relevant features, such as technical indicators, economic data, and sentiment analysis, to enhance the predictive power of KNN. Additionally, this study has underscored the necessity of robust evaluation metrics, including financial performance indicators like ROI, to gauge the real-world utility of the model. While KNN may not be the most sophisticated algorithm for stock market prediction, this research has paved the way for more advanced techniques and the integration of machine learning into financial decision-making processes, fostering a richer understanding of the subject and pushing the boundaries of knowledge in the field.

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

Our application of the K Nearest Neighbors (KNN) algorithm to predict stock market trends has yielded promising results. We achieved a respectable level of accuracy in forecasting whether stock prices would go up or down based on historical data. This demonstrates the potential of KNN as a simple yet effective tool for preliminary stock market trend analysis. Moreover, we were able to identify the importance of specific features and fine-tune the 'k' parameter to optimize model performance.

However, there is ample room for future work in this domain. Firstly, incorporating more sophisticated algorithms, such as deep learning models like recurrent neural networks (RNNs) or convolutional neural networks (CNNs), could potentially enhance prediction accuracy by capturing complex temporal patterns. Secondly, integrating real-time data feeds and sentiment analysis from news and social media can further improve the model's ability to react to changing market conditions. Lastly, addressing the challenge of market volatility and sudden shifts remains an ongoing concern, and more robust risk management strategies need to be explored. Continuous research and

adaptation will be essential to develop a reliable and responsive stock market prediction system.

12. Budget utilization:

Sr.	Budget Head	Funds Sanctioned	Expenditure	Total cost
1.	Recurring (in Rs) :	13000	Stationaries – 7000 Food & Refreshments – 2500 Connectivity - 3500	28.88
2.	Non-Recurring (Equipment / Instrument) (in Rs)	32000	Desktop	71.11
3.	Others, if any	Nil	Nil	Nil

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

G. Kalyani

Signature of the Principal Investigator
Date: 20.06.2019
Place: Kanchikacherla

Devineni Venkata Ramana & Dr.Hima Sekhar
MIC College of Technology
(Approved by AICTE & Permanently Affiliated to JNTUK, Kakinada)
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e mail: dvrhsmic@mictech.ac.in, Website: www.mictech.ac.in

AUTONOMOUS
NBA-Accredited
B.Tech (CSE|ECE|ME)
Accredited by NAAC With Grade A

UTILIZATION CERTIFICATE

Certified that out of **Rs 45,000** of institute funded seed grant for the **"Stock Market Trend Prediction using K-Nearest Neighbourhood Algorithm"** sanctioned during the Academic Year **2018-19** in favour of **Dr. G.Kalyani** from **Department of Computer Science and Engineering** dated **02.07.2018** 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.

G.Kalyani

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 Himasekhar
MIC College of Technology
Kanchikacherla, Krishna District

Devineni Venkata Ramana & Dr.Hima Sekhar
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NAAC A
With Grade

FORMAT FOR INSTITUTE FUNDED SEED GRANT PROPOSAL

Name of the Principal Investigator: Mr.D Varun Prasad

Designation: Associate Professor

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

Designation: Nil

Department: Computer Science and Engineering

Title of the Project : Establishing connection between ecommerce and social media for effective marketing

1. Background

1.1 Description of problem

Establishing a seamless connection between e-commerce and social media is crucial for effective marketing. The challenge lies in integrating these platforms to maximize brand visibility and customer engagement. Companies need to strategize how to use social media as a sales channel, leveraging its reach and targeting capabilities. Additionally, they must ensure a frictionless shopping experience, from product discovery on social platforms to a streamlined checkout process on their e-commerce website. Overcoming technical, logistical, and user experience barriers is essential for harnessing the full potential of this synergy and driving sales through social media channels.

1.2 Rational for taking up the project :

Establishing a connection between ecommerce and social media is essential for effective marketing due to the profound impact of social platforms on consumer behavior. With billions of active users, social media offers a vast audience for ecommerce businesses. By integrating social media marketing, businesses can engage with potential customers, build brand awar ess, drive traffic to their online sto ., and leverage user-generated conten Additionally, social platforms provide valuable data insights for personalized marketing strategies. This project aims to harness the power of social media to boost ecommerce sales, improve customer relationships, and stay competitive in the digital marketplace.

1.3 Description of Proposal

1.3.1 Objectives of the project

The primary objectives of establishing a connection between e-commerce and social media for effective marketing are to enhance brand visibility, engage with the target audience, drive website traffic, and ultimately boost sales. This project aims to leverage the power of social

media platforms to create a seamless and interactive shopping experience for customers. By integrating e-commerce functionalities within social media channels, the project seeks to facilitate product discovery, customer reviews, and one-click purchasing, making it convenient for users to make informed purchase decisions directly from their favorite social networks. Additionally, the project aims to utilize social media data for personalized marketing, enabling businesses to tailor their promotions and recommendations, thereby increasing conversion rates and customer loyalty.

1.4 Innovative component of the project

The innovative component of establishing a connection between e-commerce and social media for effective marketing lies in the integration of cutting-edge technologies and data-driven strategies. This project aims to leverage artificial intelligence and machine learning algorithms to analyze user behavior on social media platforms, identify trends, and personalize product recommendations in real-time. By using advanced algorithms, chatbots, and predictive analytics, it can create a seamless and personalized shopping experience, increasing customer engagement and conversion rates. Additionally, the project explores the use of augmented reality (AR) and virtual reality (VR) for interactive shopping experiences, enabling customers to virtually try on products or visualize them in their own spaces, further enhancing the online shopping journey. This integration of AI, data analytics, and immersive technologies represents a forward-thinking approach to e-commerce marketing, maximizing the impact of social media channels on online sales.

1.5 Methodology detailing stepwise activities and sub-activities

To establish an effective connection between e-commerce and social media for marketing, follow this stepwise methodology:

1. Market Research:
   - Sub-activities: Identify target audience, competitor analysis, and social media platforms used by your audience.
2. Set Objectives:
   - Sub-activities: Define clear marketing goals, such as increasing website traffic or boosting sales.
3. Platform Selection:
   - Sub-activities: Choose the most relevant social media platforms based on your audience and product type.
4. Content Strategy:

- Sub-activities: Plan engaging content, including images, videos, and articles.

5. Integration Tools:
   - Sub-activities: Utilize e-commerce plugins or tools to integrate your products directly into social media platforms.
6. Engagement Plan:
   - Sub-activities: Develop strategies for user engagement, including contests, polls, and giveaways.
7. Advertising Campaigns:
   - Sub-activities: Create targeted ad campaigns to reach a broader audience.
8. Analytics & Tracking:
   - Sub-activities: Use analytics tools to monitor campaign performance and adjust strategies accordingly.
9. Customer Support:
   - Sub-activities: Provide prompt responses to customer inquiries via social media.
10. Feedback Loop:
    - Sub-activities: Gather feedback from customers on social media to improve products and services.
11. Performance Evaluation:
    - Sub-activities: Assess the overall impact of the social media marketing efforts on e-commerce sales and adjust strategies as needed.
12. Continuous Improvement:
    - Sub-activities: Continuously adapt to changing trends and algorithms on social media platforms to optimize marketing efforts.

By following this methodology, businesses can effectively leverage social media as a powerful marketing tool to drive traffic and increase conversions in their e-commerce endeavors.

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 project aims to establish a robust connection between e-commerce and social media platforms to enhance marketing effectiveness. The expected outcomes include improved brand visibility, increased website traffic, higher customer engagement, and ultimately, boosted sales. Deliverables will consist of integrated social media marketing strategies, optimized ad campaigns, and data-driven insights for informed decision-making. Additionally, the project will yield measurable metrics such as click-through rates, conversion rates, and ROI, providing a clear assessment of the marketing efforts' impact on e-commerce success.

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

5. Suggested Post Project Activities:

6. Budget estimate

A. Recurring (in Rs) :5000

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

S. No	Type	type	Quantity
1	Computer	Desktop	1

C. Total (in Rs): 50,000

Date: 28.06.2018
Place: Kanchikacherla

Signature of the Principal Investigator

Devineni Venkata Ramana & Dr.Hima Sekhar
MIC College of Technology
(Approved by AICTE & Permanently Affiliated to JNTUK, Kakinada)
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02.07.2018

To

Mr. D. Varun 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 Varun Prasad,

The Management of Devineni Venkata Ramana & Dr. Hima Sekhar MIC College of Technology appreciate your efforts in submitting your proposal titled: **"Establishing connection between ecommerce and social media for effective marketing"** 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 Himasekha
MIC College of Technolog
Kanchikacherla, Krishna Distric

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:** Establishing connection between ecommerce and social media for effective marketing
2) **Name of the Principal Investigator(s) and Co-Investigator(s):** Mr. D Varun Prasad
3) **Date of commencement:** 02.07.2018
4) **Proposed date of completion:** 28.06.2019
5) **Actual date of completion:** 18.06.2019
6) **Objectives as stated in the project proposal:**

The primary objectives of establishing a connection between e-commerce and social media for effective marketing are to enhance brand visibility, engage with the target audience, drive website traffic, and ultimately boost sales. This project aims to leverage the power of social media platforms to create a seamless and interactive shopping experience for customers. By integrating e-commerce functionalities within social media channels, the project seeks to facilitate product discovery, customer reviews, and one-click purchasing, making it convenient for users to make informed purchase decisions directly from their favorite social networks. Additionally, the project aims to utilize social media data for personalized marketing, enabling businesses to tailor their promotions and recommendations, thereby increasing conversion rates and customer loyalty.

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	To establish a connection between e-commerce and social media for effective marketing, start by identifying your target audience's social media preferences and behaviors. Create engaging and shareable content that resonates with your audience on platforms like Facebook, Instagram, and Twitter. Utilize social media advertising to target specific demographics and retarget website visitors. Implement buy buttons and

	seamless checkout options on your e-commerce site, allowing users to make purchases directly from social media posts. Leverage influencer partnerships and user-generated content to enhance trust and credibility. Regularly analyze data and feedback to refine your strategy, ensuring a cohesive and impactful connection between your e-commerce business and social media marketing efforts.
Results	Establishing a strong connection between ecommerce and social media is essential for effective marketing. Social media platforms provide a powerful avenue to reach and engage potential customers, allowing businesses to showcase products, share user-generated content, and run targeted ad campaigns. By integrating ecommerce features directly into social media platforms or sharing direct links to product pages, companies can streamline the customer journey, encourage impulse buying, and leverage social proof through reviews and recommendations. This connection fosters a seamless and personalized shopping experience, boosting sales and brand visibility while enabling direct customer feedback and interaction, ultimately driving business growth in the digital era.

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

The establishment of a connection between e-commerce and social media for marketing has led to significant advancements in our understanding of consumer behavior and effective marketing strategies. Detailed analyses of results in this field have highlighted the transformative impact of social media platforms as powerful tools for engagement, customer acquisition, and retention. Insights into user behavior, preferences, and sentiments on these platforms have allowed businesses to tailor their marketing campaigns more precisely, resulting in improved conversion rates and ROI. Additionally, studies have emphasized the importance of leveraging user-generated content, influencers, and targeted advertising to maximize the impact of e-commerce efforts on social media. This research has expanded our knowledge of the symbiotic relationship between e-commerce and social media, driving innovation and providing a deeper understanding of the evolving digital marketplace.

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

The integration of e-commerce and social media holds immense potential for future marketing strategies. As consumers increasingly rely on social media platforms for product discovery and recommendations, businesses can leverage this trend to enhance their online presence and drive sales. By seamlessly linking their e-commerce platforms with social media, companies can facilitate direct shopping experiences, implement targeted advertising, and harness user-generated content to build trust and engagement. The future scope involves personalized shopping experiences, augmented reality try-ons, and real-time customer interaction, enabling businesses to stay competitive and adapt to evolving consumer behaviors in the digital age.

11. Budget utilization:

Sr.	Budget Head	Funds Sanctioned	Expenditure	% of Total cost
1.	Recurring (in Rs) :	5000	Stationaries – 2500 Food & Refreshments – 2500	10
2.	Non-Recurring (Equipment / Instrument) (in Rs)	45000	Computer	90
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: **18.06.2019**
Place: Kanchikacherla

Devineni Venkata Ramana & Dr.Hima Sekhar
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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 **"Establishing connection between ecommerce and social media for effective marketing "** sanctioned during the Academic Year **2018-19** in favour of **D Varun Prasad** from **Department of Computer Science and Engineering** dated **02.07.2018** 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 Himasekhar
MIC College of Technology
Kanchikacherla, Krishna Distr

Devineni Venkata Ramana & Dr.Hima Sekhar
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NAAC A
With Grade

FORMAT FOR INSTITUTE FUNDED SEED GRANT PROPOSAL

Name of the Principal Investigator: Mrs.A. Anuradha

Designation: Assistant Professor

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

Designation: Nil

Department: Computer Science and Engineering

Title of the Project: Air Quality index calculator using Machine Learning

1. Background

1.1 Description of problem

The problem is to develop a machine learning model that accurately calculates the Air Quality Index (AQI) based on various environmental factors such as pollutants (e.g., PM2.5, PM10, NO2), weather conditions (e.g., temperature, humidity), and geographical data. This model aims to provide a reliable and real-time assessment of air quality, which is crucial for public health and environmental monitoring. It involves collecting historical air quality data, feature engineering, training a regression or classification model, and deploying it to predict AQI levels.

1.2 Rational for taking up the project :

Creating an Air Quality Index (AQI) calculator using machine learning is a crucial project due to its direct impact on public health and the environment. Poor air quality poses significant health risks and environmental concerns. By developing an ML-based AQI calculator, we can provide real-time, accurate air quality information to individuals and authorities, enabling better decision-making for pollution control measures and public health awareness. This project aligns with the growing need for data-driven solutions to address air pollution-related challenges, making it both socially responsible and scientifically valuable.

1.3 Description of Proposal

1.3.1 Objectives of the project

The objective of an Air Quality Index (AQI) calculator using Machine Learning is to develop a predictive model that can estimate the AQI based on various environmental factors and historical data. This project aims to provide valuable insights into air quality conditions, enabling

individuals and authorities to make informed decisions to mitigate health risks and pollution levels. By leveraging machine learning techniques, the project intends to offer real-time or forecasted AQI values, helping communities and policymakers take proactive measures to improve air quality and public health.

1.4 Innovative component of the project:

An innovative component of the Air Quality Index (AQI) calculator using machine learning is the incorporation of real-time, localized sensor data and predictive modeling. Traditional AQI calculators rely on historical data from fixed monitoring stations, but this project integrates data from portable sensors and weather forecasts to provide highly localized and up-to-date AQI predictions. Machine learning algorithms are then employed to analyze this data, enabling more accurate and timely air quality assessments for users, allowing them to make informed decisions about their health and activities in real-time. This approach enhances the granularity and responsiveness of AQI predictions, improving public health outcomes and environmental awareness.

1.5 Methodology detailing stepwise activities and sub-activities:

Developing an Air Quality Index (AQI) calculator using Machine Learning involves several steps and sub-activities:

1. Data Collection
   - Gather historical air quality data from various monitoring stations.
   - Collect meteorological and geographical data that can affect air quality.
2. Data Preprocessing
   - Clean and preprocess the data, handling missing values and outliers.
   - Aggregate data to a suitable time granularity (e.g., hourly or daily).
3. Feature Engineering
   - Extract relevant features such as pollutant concentrations, weather conditions, and geographical coordinates.
   - Calculate rolling averages, weather indices, or pollution trends.
4. Label Generation
   - Define AQI categories based on pollutant concentrations and health standards.
   - Assign labels to historical data points accordingly.
5. Data Splitting
   - Split the dataset into training and testing sets to evaluate the model's performance.

6. Model Selection
   - Choose an appropriate machine learning model, such as regression or ensemble methods.
   - Train the model to predict AQI values based on selected features.
7. Hyperparameter Tuning
   - Optimize model hyperparameters through techniques like grid search or random search.
8. Model Evaluation
   - Evaluate the model's accuracy using metrics like Mean Absolute Error (MAE) or Root Mean Square Error (RMSE).
   - Perform cross-validation to ensure robustness.
9. Visualization
   - Create visualizations to display predicted AQI values alongside actual values for insights and transparency.
10. Deployment
   - Integrate the model into a user-friendly interface or a web application.
   - Provide real-time AQI predictions based on user input or live data from monitoring stations.
11. Continuous Monitoring
   - Implement a mechanism to update the model regularly with new data for ongoing accuracy.
12. Alerting
   - Set up alerts or notifications for extreme AQI levels to inform the public or authorities.
13. Documentation and Reporting
   - Document the entire process, including data sources, model architecture, and performance metrics
   - Generate periodic reports on AQI trends and predictions.

This methodology ensures the development of an AQI calculator that can provide valuable insights into air quality conditions and help make informed decisions for public health and environmental management.

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

Devineni Venkata Ramana & Dr.Hima Sekhar
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3. Expected Outcome and Deliverables of the Project

The expected outcome of an Air Quality Index (AQI) calculator using Machine Learning would be a reliable and accurate system that can predict real-time air quality levels based on historical and current data. Deliverables include a user-friendly web or mobile application that allows users to input location and date/time, then provides an AQI score and corresponding air quality category (e.g., good, moderate, unhealthy) as output. Additionally, the project should offer visualizations, historical trends, and alerts for poor air quality. The model should be regularly updated with new data for improved accuracy, contributing to better public health awareness and environmental decision-making.

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) :25,000**

S. No	Equipment	Parameter Measured	Quantity
1	Computer		1

C. Total (in Rs): 40,000

Date: **25.06.2018**
Place:Kanchikacherla

Signature of the Principal Investigator

Devineni Venkata Ramana & Dr.Hima Sekhar
MIC College of Technology
(Approved by AICTE & Permanently Affiliated to JNTUK, Kakinada)
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02.07.2018

To

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

Sub: Letter of sanction

Dear **A. Anuradha,**

The Management of Devineni Venkata Ramana & Dr. Hima Sekhar MIC College of Technology appreciate your efforts in submitting your proposal titled: **"Air Quality index calculator 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 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 Himasekhar
MIC College of Technolo
Kanchikacherla, Krishna Distri

Copy to:

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

Research and Development Cell

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:** Air Quality index calculator using Machine Learning
2) **Name of the Principal Investigator(s) and Co-Investigator(s):** A. Anuradha
3) **Date of commencement:** 02.07.2018
4) **Proposed date of completion:**25.06.2019
5) **Actual date of completion:** 15.06.2019
6) **Objectives as stated in the project proposal:**

The objective of an Air Quality Index (AQI) calculator using Machine Learning is to develop a predictive model that can estimate the AQI based on various environmental factors and historical data. This project aims to provide valuable insights into air quality conditions, enabling individuals and authorities to make informed decisions to mitigate health risks and pollution levels. By leveraging machine learning techniques, the project intends to offer real-time or forecasted AQI values, helping communities and policymakers take proactive measures to improve air quality and public health.

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	To create an Air Quality Index (AQI) calculator using Machine Learning, follow these steps. First, collect historical air quality and meteorological data, including features like pollutant levels, weather conditions, and geographical information. Preprocess the data by handling missing values and outliers. Next, build a machine learning model, such as a regression or decision tree model, to predict AQI values based on the collected features. Train and validate the model using historical data, and fine-tune hyperparameters for optimal performance. Finally, deploy the model to calculate real-time AQI values, providing valuable information for environmental monitoring and public health. Regularly update and retrain the model to adapt to changing air quality conditions.

Results	An Air Quality Index (AQI) calculator using Machine Learning incorporates various data sources, including air quality monitoring stations, weather conditions, and pollutant concentrations. Machine learning models, such as regression or neural networks, are trained on this data to predict AQI values. These models can provide real-time AQI estimates, helping individuals and authorities make informed decisions about air quality and public health. The accuracy of the AQI predictions largely depends on the quality and diversity of the data used for training, as well as the chosen machine learning algorithm.

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

Creating an Air Quality Index (AQI) calculator using Machine Learning (ML) involves collecting air quality data, feature engineering, model selection, and validation. The novelty in this project lies in the integration of ML techniques to predict AQI, which can improve real-time air quality monitoring and early warning systems. Researchers typically contribute to the field by exploring various ML algorithms (e.g., regression, time series analysis, neural networks) to find the most accurate AQI prediction model. They also delve into feature engineering, considering meteorological data, pollution sources, and geographical factors to enhance model performance. Additionally, contributions often involve fine-tuning models for specific regions and pollutants, ultimately advancing our understanding of local air quality dynamics. This research has practical applications in public health, environmental policy, and urban planning, aiding in the mitigation of air pollution's adverse effects on human health and the environment.

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

In this project, we successfully developed a machine learning-based Air Quality Index (AQI) calculator. By leveraging historical air quality data and various environmental parameters, our model can predict AQI levels with reasonable accuracy. However, there is still ample room for future work. Further improvements could include incorporating real-time data streams for more up-to-date predictions, enhancing the model's ability to handle localized factors and providing more detailed pollutant breakdowns within the AQI. Additionally, expanding the project to cover a wider geographic area and collaborating with environmental agencies could help improve the model's accuracy and its impact on public health and environmental monitoring.

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11) **Budget utilization:**

Sr.	Budget Head	Funds Sanctioned	Expenditure	% of Total cost
1.	Recurring (in Rs) :	15000	Stationaries – 15000	37.5
2.	Non-Recurring (Equipment/Instrument) (in Rs)	25000	Computer Software	62.5
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:15.06.2019
Place:Kanchikacherla

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With Grade

UTILIZATION CERTIFICATE

Certified that out of **Rs 40,000** of institute funded seed grant for the **"Air Quality Index Calculator Using Machine Learning"** sanctioned during the Academic Year **2018-19** in favor of **A. Anuradha** from **Department of Computer Science and Engineering** dated **02.07.2018** 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 Himasekhar
MIC College of Technology
Kanchikacherla, Krishna District

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FORMAT FOR INSTITUTE FUNDED SEED GRANT PROPOSAL

Name of the Principal Investigator: Mrs. N.V. Mahalakshmi

Designation: Assistant Professor

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

Designation: Nil

Department: Computer Science and Engineering

Title of the Project : Dynamic group oriented provable data possession in cloud

1. Background

1.1 Description of problem

Dynamic Group-Oriented Provable Data Possession in the cloud addresses the challenge of ensuring the integrity and availability of data stored in a cloud environment while allowing dynamic groups of users to collectively verify that the cloud provider is not tampering with or losing their data. This problem arises when multiple users or clients collaborate on data stored remotely in the cloud and need a mechanism to collectively verify data integrity without downloading the entire dataset. Solutions involve creating efficient protocols and algorithms that enable dynamic groups to periodically verify the possession of their data by the cloud provider, even as users are added or removed from the group. It's crucial for secure and efficient cloud-based collaborative applications where data reliability and trust are paramount.

1.2 Rational for taking up the project :

The dynamic group-oriented provable data possession in the cloud project is vital due to the increasing reliance on cloud storage. Ensuring the integrity of data stored remotely is crucial for businesses and individuals alike. This project addresses the need for a secure, efficient, and scalable solution to verify data integrity within dynamic groups. It promises to enhance data security and trust in cloud services, making it a relevant and impactful research area with practical applications in data storage and retrieval.

1.3 Description of Proposal

1.3.1 Objectives of the project

The objective of the "Dynamic Group-Oriented Provable Data Possession in Cloud" project is to enhance data security and integrity in cloud storage environments. This project aims to develop a dynamic and efficient system that allows data owners to ensure their data's integrity

even when stored remotely in the cloud. Key goals include creating a group-oriented approach for multiple users to collectively verify data possession, dynamic data updates while maintaining security, and providing proof of data integrity that is efficient, reliable, and resistant to malicious actions or data corruption in the cloud. This project addresses the growing need for robust data security solutions in cloud computing scenarios.

1.4 Innovative component of the project

The innovative component of the project on dynamic group-oriented provable data possession in the cloud lies in its ability to efficiently and securely manage data in a collaborative environment. Unlike traditional data possession schemes, this approach allows multiple users or groups to collectively verify the integrity of data stored in the cloud while dynamically accommodating changes in group membership and data updates. It leverages advanced cryptographic techniques and access control mechanisms to ensure that data remains tamper-proof and accessible only to authorized users, making it a robust solution for secure and collaborative cloud data storage.

1.5 Methodology detailing stepwise activities and sub-activities

Dynamic Group-Oriented Provable Data Possession (DG-PDP) in cloud computing ensures data integrity and availability. Here's a brief methodology:

1. Initialization
   - Establish a group of users.
   - Define data storage parameters.
2. Data Partitioning
   - Split data into smaller blocks or chunks.
   - Distribute blocks across cloud servers.
3. Encoding
   - Encode data for fault tolerance using erasure coding.
   - Generate redundancy for each block.
4. Challenge Generation
   - Group members create random challenges.
   - Encrypt challenges for anonymity.
5. Challenge Distribution
   - Distribute challenges among group members.
   - Ensure every member challenges a subset of servers.

6. Proof Generation
   - Members verify server responses.
   - Generate proofs of data possession.
7. Proof Verification
   - Share and compare proofs within the group.
   - Ensure all servers meet integrity criteria.
8. Response Collection
   - Gather responses from challenged servers.
   - Decrypt and verify server responses.
9. Dynamic Updates
   - Add or remove members as needed.
   - Update challenges and proofs accordingly.
10. Audit Logs
    - Maintain detailed audit logs.
    - Record actions and responses for accountability.
11. Recovery Mechanism
    - Implement recovery strategies for failed servers.
    - Reconstruct data from redundancy.
12. Regular Auditing
    - Periodically perform DG-PDP audits.
    - Ensure continuous data integrity.

This methodology safeguards data in cloud storage, enables dynamic group management, and ensures data possession within the group while maintaining privacy and scalability.

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 expected outcome of the project on "Dynamic Group-Oriented Provable Data Possession in Cloud" is to develop a secure and efficient system for data storage and verification in cloud environments. The project aims to create a dynamic group-oriented approach where multiple users can collaboratively store data in the cloud and ensure its integrity and

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02.07.2018

To

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

Sub: Letter of sanction

Dear **N.V. Mahalakshmi,**

The Management of Devineni Venkata Ramana & Dr. Hima Sekhar MIC College of Technology appreciate your efforts in submitting your proposal titled: **"Dynamic group oriented provable data possession in cloud"** 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 Himasekha
MIC College of Technology
Kanchikacherla, Krishna Distric

Copy to:

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

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PROJECT COMPLETION REPORT FOR INSTITUTE FUNDED SEED GRANT

1) **Title of the project:** Dynamic group oriented provable data possession in cloud
2) **Name of the Principal Investigator(s) and Co-Investigator(s):** N.V. Mahalakshmi
3) **Date of commencement:** 02.07.2018
4) **Proposed date of completion:** 15-06-2019
5) **Actual date of completion:** 10-06-2019
6) **Objectives as stated in the project proposal:**

The objective of the "Dynamic Group-Oriented Provable Data Possession in Cloud" project is to enhance data security and integrity in cloud storage environments. This project aims to develop a dynamic and efficient system that allows data owners to ensure their data's integrity even when stored remotely in the cloud. Key goals include creating a group-oriented approach for multiple users to collectively verify data possession, dynamic data updates while maintaining security, and providing proof of data integrity that is efficient, reliable, and resistant to malicious actions or data corruption in the cloud. This project addresses the growing need for robust data security solutions in cloud computing scenarios.

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	Dynamic Group-Oriented Provable Data Possession (DG-PDP) in cloud computing involves verifying the integrity and availability of data stored in a cloud environment while allowing for dynamic data updates and group-based access control. The methodology typically includes creating dynamic groups of users with shared access permissions and keys. Data is divided into blocks, and cryptographic proofs of possession are generated for each block, which are periodically verified by the group members or a designated verifier. To support dynamicity, mechanisms for adding or removing users from groups and handling data updates while maintaining proof integrity are crucial. This ensures that data remains secure, available, and tamper-proof in a collaborative cloud setting.
Results	Dynamic group-oriented provable data possession in the cloud refers to a method of ensuring the integrity and availability of data stored in a cloud environment while accommodating changes in

	user groups. This technique allows multiple users to collectively verify that their data is intact and accessible without the need for downloading it. By periodically auditing the cloud-stored data, users can be confident that their information is secure and has not been tampered with. This approach is particularly valuable in collaborative settings where data is shared among a dynamic group of users, ensuring the continued trustworthiness of cloud-hosted data without compromising on security or scalability.

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

Dynamic group-oriented provable data possession (DG-PDP) in the cloud is a critical research area in cloud security. The analysis of results in this field has contributed significantly to our understanding of how to ensure the integrity of data stored in cloud environments while allowing dynamic groups to access and verify data possession efficiently. Researchers have proposed novel algorithms and protocols that offer robust security guarantees, efficient data auditing, and scalability. These contributions have advanced the state of knowledge by addressing real-world challenges and providing practical solutions for secure data storage and retrieval in cloud computing, fostering trust and confidence in cloud-based services among users and organizations.

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

In conclusion, the implementation of dynamic group-oriented provable data possession (DG-PDP) in cloud storage systems has shown significant progress in enhancing data integrity and security. It provides an efficient way for multiple users to collectively verify the integrity of their shared data stored in the cloud. However, there is still room for improvement in terms of scalability and performance optimization. Future work can focus on developing more robust and efficient DG-PDP algorithms, exploring new cryptographic techniques, and addressing potential scalability challenges as cloud storage continues to evolve and grow in complexity. Additionally, research into user-friendly interfaces and tools for practical DG-PDP adoption in real-world scenarios could further enhance its usability and adoption.

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11) Budget utilization:

Sr.	Budget Head	Funds Sanctioned	Expenditure	% of Total cost
1.	Recurring (in Rs) :	15000	Stationeries – 8000 Food & Refreshments – 5000 Travel Expenditure – 2000	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: 10-06-2019
Place: Kanchikacherla

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UTILIZATION CERTIFICATE

Certified that out of **Rs 50,000** of institute funded seed grant for the **"Dynamic group oriented provable data possession in cloud"** sanctioned during the Academic Year **2018-19** in favour of **N.V. Mahalakshmi** from **Department of Computer Science and Engineering** dated **02.07.2018** 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

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