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3.2.1 Institution has created an ecosystem for innovations and has initiatives for creation and transfer of knowledge.

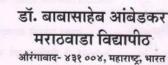
Institution has created an ecosystem for innovations and case studies in various Programmes are elaborated on sample basis with supporting documents (open link for supporting documents) that shows an ecosystem for innovations and has initiatives for creation and transfer of knowledge.

1. Research and Development Centre & Committee members

D\Research Center Data/Research Center Positive and Migetive Letter (M) Dr. Babasaheb Ambedkar Marathwada University

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नॅक समितीतर्फे 'अ' दर्जा प्राप्त

Office : Academic Section कार्यालय :- शैक्षणिक विभाग (संलग्नीकरण)

संदर्भ क्र. : शीक्ष/ संलान/एआरडब्ल्यु/२०२०-२१/ 22177-79

दि. २४-११-२०२०.

प्रति, प्राचार्य,

श्रीयश प्रतिष्टाण संचलित, श्रीयश प्रतिष्टाण संचलित, श्रीयश कॉलेज ऑफ इंजिनिअरिंग ॲण्ड टेक्नॉलॉजी,

> विषय :- शैक्षणिक वर्ष २०२०-२१ पासून मेकॅनिकल इंजिनिअरिंग विषयाच्या संशोधन केंद्रास मान्यता देणे बाबत.

संदर्भ :- १) आपला संशोधन केंद्रासाठीचा प्रस्ताव.

- २) प्रस्तावित संशोधन केंद्रासाठी तज्ञ समितीने सादर केलेला अहवाल.
- महाराष्ट्र सार्वजनिक विद्यापीठ अधिनियम २०१६ कलम १११ (१) ते (८) अन्वये निश्चित केलेले निकष.
- ४) पीएच.डी. अध्यादेश १६७ (इ) अन्वये निश्चित करण्यात आलेले निकष.
- अधिष्ठाता मंडळाने दि. २७-०८- २०२० रोजी घेतलेल्या धोरणात्मक निर्णयानुसार केलेली शिफारस.

महोदय / महोदया,

उपरोक्त संदर्भिय विषयाच्या अनुषंगाने मा. कुलगुरु महोदयांनी दिलेल्या आदेशानुसार आपणास कळविण्यात येते की, महाराष्ट्र सार्वनिक विद्यापीठ अधिनियम २०१६ कलम १११ (१) ते (८) व पीएच.डी. अध्यादेश १६७ (इ) अन्वये विहित केल्यानुसार विद्यापीठाने / अधिष्ठाता मंडळाने प्राप्त प्रस्तावांची छानणी / तपासणी करुन नियुक्त केलेल्या चौकशी / तज्ञ समितीने सादर केलेल्या अहवालानुसार मेकॅनिकल इंजिनिअरिंग विषयाच्या संशोधन केंद्रास शैक्षणिक वर्ष २०२०-२१ पासून खालील कोष्टकात दर्शविण्यात आलेल्या अध्यासक्रमानुसार प्रवेश क्षमतेसह मान्यता देण्यात येत आहे.

अ.	महाविद्यालयाचे नाव	संशोधन केंद्राचे अभ्यासक्रमासह	विद्यापीठाने निर्घारित
क्र.		नाव	केलेली प्रवेश क्षमता
٧.	श्रीयश कॉलेज ऑफ इंजिनिअरिंग ॲण्ड टेक्नॉलॉजी, औरंगाबाद.	संशोधन केंद्र मेकॅनिकल इंजिनिअरिंग	१० विद्यार्थी

प्रस्तुत प्रकरणी अधिष्ठाता मंडळाने शिफारशित केल्यानुसार महाराष्ट्र सार्वजनिक विद्यापीठ अधिनियम २०१६ कलम १११ (७) अन्वये विहित केल्यानुसार मा. कुलगुरुंना प्राप्त असलेल्या अधिकारानुसार उपरोक्त कोष्टकात विनर्धिष्ठित करण्यात आलेल्या संशोधन केंद्रास मान्यता देण्यात आलेली आहे. प्रस्तुत प्रकरणी आपणास असेही अवगत करण्यात येते की, सदरील संशोधन केंद्राची मान्यता शैक्षणिक वर्ष २०२०-२१ ते शैक्षणिक वर्ष २०२२-२३ पर्यंत अनुज्ञेय राहील. सदरील संशोधन केंद्राच्या मान्यतेचा कालावधी संपण्यापूर्वी सहा महिने अगोदर विद्यापीठास पुनर्रमान्यता / पुनर्रसंलग्नीकरणासाठी विहित शुल्क व पुरक दस्ताऐवजासह प्रस्ताव सादर करणे अनिवार्य राहील, अन्यथा सदरील संशोधन केंद्राची मान्यता आपोआप संपूष्टात येईल, याची कृपया सर्व संबंधितांनी गांभीर्याने नोंद घेण्यात यावी.

प्र कुलगुरु

प्रतिलिपी:-

 उपकुलसचिव, पदव्युत्तर / पीएच.डी. विभाग, डॉ. बाबासाहेब आंबेडकर मराठवाडा विद्यापीठ, औरंगाबाद यांना माहितीस्तव अग्रेषित.

२. संचालक, युनिक, डॉ. बाबासाहेब आंबेडकर मराठवाडा विद्यापीठ, औरंगाबाद यांना माहितीस्तव अग्रेषित.

- sd -प्र कुलगुरु

स्थान प्राप्त के प्रत्योक्षेत्र विद्यालया विद

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Shreeyash Pratishthan's

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Dr. Babasaheb Ambedkar Technological University, Lonere, Raigad.



Research and Development Centre

A committee is constituted for research and development work at SYCET, consists of following members .All committee members should act and do the needful in this regard.

	Name of Faculty Members	Department	Designation
1.	Dr. Hulas Raj Tonday	Mech Engg	Head
2.	Dr. Masarrat Sultana	Civil Engg	Member
3.	Dr. Praveen Shastri	MBA	Member
4	Prof. K. T. Patil	Mech Engg	Member
5	Prof. A.N. Shaikh	ETC Engg	Member
6.	Prof. D. A. Deshmukh	Mech Engg	Member
7.	Prof. K. K. Pathak	Civil Engg	Member
8.	Prof. Mrs. Y. A. Kale	Electrical Engg	Member
9.		Engg Science	Member
	Prof. Mrs. Rubina Shah	CSE	Member

Functions of R&D Centre

- To identify the potential areas of research in various disciplines
- To prepare the proposals in order to apply for funded projects
- To encourage multidisciplinary research within the institute and externally with other organizations
- To identify the research areas and divide the faculty into research clusters based on their specialization
- Identify the area of research and encourage the staff to attend the conferences in their specialized areas
- Paper publications by students and faculties.
- To provide research conducting and testing facilities with proper infrastructure.

1. Notice Board

2. Copy to: - All Committee Members

Shreeyash College of Engineering & Technology Aurangabad



ShreeyashPratishthan's

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Tel/Fax- (0240) 6608772/706/713/784 Visit: www.syp.ac.in &www.sycet.org

Date: 05/02/2021

Research and Development Centre

MINUTES OF MEETING

A meeting of committee members was held on 5th Feb., 2021 in Room No. 002 Dept. of Mechanical Engineering in order to discuss the research disciplines and novel topics for final year project works of UG and PG students in all the Depts. Every member of each department had given their views regarding the research interest of faculties and students. It had been decided that students will give their review report and presentation on line mode due to ongoing Covid 19 pandemic situation. The following members were present in the meeting.

	Name of Faculty Members	Department	Designation
1	Dr. Hulas Raj Tonday	Mech Engg	Head +
2	Dr. Masarrat Sultana	Civil Engg	Member Atla
3	Dr. Praveen Shastri	MBA	Member Randing
4	Prof. K. T. Patil	Mech Engg	Member
5	Prof. A.N. Shaikh	ETC Engg	Member Hinler
6	Prof. D. A. Deshmukh	Mech Engg	Member Hang
7	Prof. K. K. Pathak	Civil Engg	Member Patalc
8	Prof. Mrs. Y. A. Kale	Electrical Engg	Member Hvall
9	Dr. H. A. Khawal	Engg Science	Member Man
10	Prof. Mrs. Rubina Shah	CSE	Member William

State of Engineering & Technology & Turangabad *

Dr. R.S. Pawar Principal



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Dr. Babasaheb Ambedkar Technological University, Lonere, Raigad.



Date: 14-06-2021

Ref. sycet / Admin /2021/229 D

Entrepreneurship Development Cell

A committee is constituted for Entrepreneurship Development Cell at SYCET, consists of following members. All committee members should act and do the needful in this regard.

	Name of Faculty Members	Department	Designation
1.	Prof. Anil Palve	MBA	Head
2.	Prof. A. V. Karadhhele	Mech Engg	Member
3.	Prof. Mrs. S. Waghmare	ETC Engg	Member
4.	Prof. S. S. Rathod	Electrical Engg	Member
5.	Prof. Miss. Kiran Katake	CSE	Member

Functions of EDC

- To promote Entrepreneurial culture in campus
- To encourage E-Cell students to take new initiative for interaction with successful entrepreneurs.
- To create an environment for self-employment and entrepreneurship development through formal and non-formal programmes.
- To generate innovative ideas and help students to become entrepreneurs.
- To assist students in legal procedure for registering new enterprises.

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1. Notice Board

2. Copy to: - All Committee Members

Dr. R.S. Pawar Principal

Principal
Shreeyash College of Engineering
& Technology Aurangabad

3. Sample of Research Papers in the Notified Journals, Conferences, FDP/STTP Sessions

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Original Article

Study of Implementation of Agile Supply Chain For Efficient Delivery of Essentials During Covid-19

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Abstract - At present, a deadly first wave and second wave of Coronavirus attacked people worldwide. In India, different variants of the virus are spreading speedily across the country which causes a higher demand for large numbers of medical equipment and Oxygen gas cylinders for COVID-19 patients. Before this pandemic, such amounts of medical equipment and Oxygen gas have not been demanded in hospitals of India. The main objectives of this paper are: 1) to study the methods that assure reliable and economical delivery of essential commodities, 2) to research on the processes that permit easy access of essentials to all patients and registered suppliers when they are required, 3) to examine the dimensions of the agile supply chain and their utilization during pandemics, and 4) to contemplate the concepts and framework of the agile supply chain for the delivery and distribution of essential commodities during the Covid-19 pandemic.

Keywords — Coronavirus, agile supply chains, lean strategy, inventory management, logistics management, essential commodities.

I. INTRODUCTION

The concept of supply chain management (SCM) was introduced in the 1980s. Several authors and researchers have pointed out the need to integrate key business processes, from end-user to first-time vendors. SCM focuses on planning, forecasting, purchasing, storage, mobility, product integration, and product tracking. SCM is essential for efficiency. It plays a role in cultural evolution and helps to improve the quality of life. It creates jobs, reduces pollution, and improves the quality of life. Agile Manufacturing (AM) is a novel manufacturing concept that is designed to improve the competitiveness of firms [1]. Manufacturing/service processes followed the concepts of AM are prioritized by integrated methods for PDS, actual production, marketing, delivery, and maintenance services [2]. In Agile manufacturing, there is a great focus on customers to ameliorate the competitiveness, accommodate the changes in markets, and also collecting data at every stage of the process. The term agility was coined in 1993 by

Goldman et al. [3, 4]. Agility means "readiness to change", from the management viewpoint, the definition of agility is that it is a blueprint, which is more amenable in uncertain business scenarios and emergency situations [4]. As buyers purchasing patterns are varying every day, thereby the entire supply chain networks changes. The parameters such as speed, cost, and efficiency are the elemental drivers of supply chain agility [5] as shown in figure 1. Agile supply chain networks are dependent on the perceptivity of buyers' demand. The term Agile is traced from the Latin term agilis which means "nimble or quick," and from the term agere which means "to set or keep in movement". Therefore, the meaning of agility is to move quickly and easily [6].

The pandemic that occurred due to COVID-19 has outraged the global supply chains of almost all kinds of products including medical support systems, foods, drugs, automotive parts, textiles, etc. as lockdown inflicted in several countries where Coronavirus is spreading quickly. The government of several countries tries to re-establish the supply chain system for at least availing the healthcare support systems, medicines, foods, and other essentials. Still, there is a scarcity of life-saving commodities and their price hikes in several countries [7]. The people are afraid of losing their loved ones and unnecessary storing the essential items in large quantities. Therefore, it is the need of the present situation to create awareness among the common people, share information transparently, and utilize the modern supply chain concepts such as lean and agile supply chain [8]. At present, there are different challenges for researchers and companies to deal with, which are resisting the smooth operation of logistics and supply chain systems. In the present decades, the exploitation of agile manufacturing systems and agile supply chain systems are the key concerns during pandemic situations. To cogitate the furtherance in this field, a critical literature review has been carried out and found the research gaps.



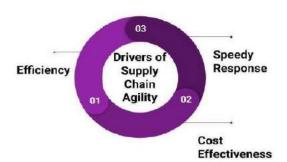


Fig 1: Drivers of supply chain agility.

II. LITERATURE REVIEW

Large numbers of research works had been published in the field of agile supply chain before the existence of the Covid-19 pandemic. The context of the previous literature was applied for developing new models and methods for further improvement in this field. The purpose of supply chain management has historically been informed by knowledge of narrow functional areas such as logistics, materials handling, distribution, and documentation of deliveries. Nagel & Dovein [1] recommended the use of automation technology to achieve agility in supply chain management. A significant increase in work published in this field has occurred between 2001 and 2011. Supply chain management continues to be largely eclectic with little consensus on its conceptualization and research methodological bases. Moreover, it has been identified works of literature on logistics and transportation capabilities and the various elements and dimensions that contribute to supply chain agility [9]. In today's competitive environment and pandemic situations, businesses are increasingly reliant on the relationships they have with their suppliers or buyers in a timely manner. The purpose of this paper through reviewing cross literature analyzes critical determinants of the agile supply chain and provides a new theoretical framework for underpinning and driving the supply chain agility [10]. Choi [11] identified that the supply chain disruption can be controlled and smoothen by efficient logistics systems. They have also supported the "bringservice- near-your-home" concept to deal with the disruptions due to Coronavirus. Mehrotra et al. [12] procreated demand scenarios based on the multi-period stochastic programming model for distribution of ventilators for COVID-19 patients. Ivanov et al. [13, 14] developed a plan of digital supply chain model to cope with the issues of supply chain disruptions during and post COVID-19. Shahed et al. [15] formulated a mathematical inventory model based on the renewal reward theory to diminish the risk of supply chain discontinuity. They also suggest agile supply chain networks. There is the utilization of optimization techniques to help the manufacturer for decisions making & maximizing

the profit [16]. Sing et al. [17] worked up a simulation model for public distribution of foods and other essentials. They have identified a breach in the food supply chain due to COVID-19 and suggested that their simulation model assist in decision-making and procreate agile supply chain networks.

In this work, a critical review of published articles, books, and magazines has been carried out in the field of agile supply chain management and its applicability during the COVID-19 pandemic. Several authors have developed various empirical, mathematical, and simulation models on the concept of agile supply chain management but none of them has applied those models for efficient delivery and distribution of essential commodities during the COVID-19 pandemic. It is required to examine the influence of supply chain collaboration and flexibility in pandemic circumstances. It is also crucial to investigate the impact of supply chain agility on the smooth delivery of commodities in need of people. However, it has been found that very little research has been performed to apply the concept of agile supply chain management to deliver medicines, equipment, and essential items in a challenging pandemic situation.

III. METHODOLOGY

A. Supply Chain Agility

Agility refers to the effective and flexible accommodation of unique customer demands. The major role to impart an agile response is flexibility throughout the supply chain. In modern manufacturing, this could necessitate the capability to manufacture and supply in large or small batches, reducing the pain related to machines and product changeovers, often known as a critical component of lean manufacturing. Agility must also require flexible personnel with members cross-trained or capable to carry out a variety of jobs as directed by the demand condition during the COVID-19 pandemic. Product development and design would also reflect mitigated in the assembly that allows for quick transformation of materials from raw to finished good. Beyond the capabilities of the dedicated industries, the rest of the supply chain must be responsive as well for agile market accommo-dation. Moreover, the term short is used for feedback-related supply chains where fewer or no middleman is allowed. The delivery and distribution could be located at appropriate places, and information sharing among the companies should be transparent and frequent. The fundamental elements of a supply chain are shown in figure 2. A well-known example of agile industry transformation is exercised by Dell in its direct-to-consumer business model. The computer maker holds inventories of component parts such as hard drives, processors, memory storage media, monitors, speakers, and a host of other supplies at each of the company's three assembly plants in the U.S.



Fig 2: Fundamental elements of a supply chain.

B. Methodology for agile supply chain

The methodology for obtaining the agile supply chains during the circumstances of COVID-19 pandemic can be discussed under the following four viewpoints:

- Agile Planning
- · Manufacturing and supply chain systems
- Utilization of technology
- Manpower planning

a) Agile Planning

A novel agile structure system needs to be developed for the COVID-19 pandemic based on the well-established architecture of supply chain systems. The context such as processes, control & monitoring, information, and data sharing, development, delivery, and distribution are primary elements of the architecture of agile manufacturing and supply chain systems. In the present portion, the strategically consummated structure of agility is explained. High-level integration of suppliers, manufacturers, distributors, retailers, and delivery personnel for each and every product is significant for supply chain management in pandemic conditions.

b) Manufacturing and Supply Chain Systems

The first pace of methodology of agility is to combine a designed route sheet, schedule, control, monitoring, and feedback system. Real-time monitoring of essential commodities from their production to end use is an important criterion for expedient development and implementation of an agile supply chain. Since the essential items are well-established products, there is no need to waste time in design and process planning. The production should be continued by using automatic machinery in less time and at minimum cost based on the demands during an emergency. The shop floor manager furnishes the items' requirements to the automatic machines. The manufacturer has knowledge about the functionality, process plans, capabilities, schedules, and tooling. Collaborating with suppliers or traders is a matter of concern and a traditional task in the agile supply chain rather than timely dispatching and delivery are complicated in dynamic market conditions. The parameters such as timely dispatching and delivery,

location, quality of and quantity of essentials responsiveness, and costs, and online platforms should be considered primary during collaboration with partner companies during pandemics. The conventional way of collaboration will not work in emergency conditions like COVID-19.

c) Utilization of Technology

It is a crucial circumstance, when everyone should learn from Indian e-commerce giants such as Amazon, Flipkart, shopclues, Paytm mall, Zomato, swiggy, Jiomart, Domino's and many more how they are utilizing the modem technologies such as internet, robots, automation in materials handling, drones, artificial intelligence, and machine learning, IoT, etc. How do they manage their physical resources and manpower to achieve agility and high-level flexibility? In this pandemic, Government and private sectors should utilize these advanced techniques and managerial concepts effectively and expeditely. Agility in the supply chain can also be augmented by the use of these appropriately integrated technologies.

d) Manpower planning

Manpower is the crucial factor for acquiring agility in the supply chain and logistics for loading, unloading, and distribution of products. Several authors have found that it is hard to organize and directs people towards flexibility in supply chain and logistics. Manpower planning significantly influences the decisiveness and ideas of obtaining agile supply chain systems. Many authors suggested that there should be openness and transparency to sharing information from top management to bottom and vice-versa in a speedy growing agile environment. In COVID-19 circumstances, novel challenges have occurred for HR managers as the deadly coronavirus spreads from person to person who is working together without maintaining social distancing. So many personnel are in fear of getting affected by COVID-19; therefore, they refuse to work in a flexible environment. It is very difficult to encourage people to join their duties on time and work efficiently. This scenario originates & new research challenges for industries and academia.

IV. DISCUSSION AND DISSEMINATION

A. Agile Supply Chain

Basically, the agile supply chain is referred to the concept of responsiveness, competency, flexibility, and quickness to manage a supply chain entity that operates on a daily basis. The benefit of Agility in the supply chain is to focus on avoiding quick shortages and eliminating excessive stocked inventory. 1. The concept of the agile supply chain is first built by Dr. Fisher's which works with efficient and responsive supply chain strategies. 2. That involves Conditions of demand uncertainty and implicitly of stable characteristics. 3. After Dr. Fisher's concept of an agile supply chain is described that supply uncertainty also needs

to be considered for varying conditions of the supply chain.

4. Focusing on the Agile supply chain there should be high demand uncertainty and supply uncertainty which means high responsiveness and risk-hedging.

B. Agile Supply Chain Strategy involves

1. Relationships 2. Sensitivity 3. Processes 4. Information 5. Flexibility

In a complex covid-19 situation, the supply chain management plays a crucial role and due to this pandemic, there are lots of failures of this process: 1) missing documentation, 2) late for damage shipment, 3) quality issues, and 4) ingredient shortages. Due to these kinds of failures, new challenges occur in front of industries which is something extraordinary and unexpected that's why we should have the ability to identify, track and manage issues anywhere in the supply chain. To improve the way of supply chain management Agile supply chain is used which basically focuses on being responsive and flexible towards customer changing needs while in disruption risks. The goal of agile supply chain management is to quickly respond to changing supply and demand conditions. The essential components of agile supply chain are shown in figure 3.

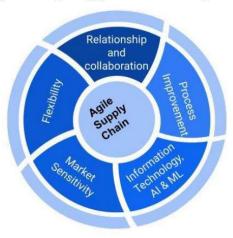


Fig 3: Essential components of agile supply chain.

C. Five dimensions of the agile supply chain

The five dimensions of the agile supply chain suggested by Gligor et al.[9, 10] his article are alertness, accessibility, decisiveness, swiftness, and flexibility. These dimensions are sequential and mandatory criteria to obtain an agile supply chain in any industry & Government organization. The intended zone of agility will be consummated by effectuating these five capabilities in their organizations for supply chain management in normal conditions as well as COVID-19 pandemics. These five dimensions of the agile supply chain are illustrated in figure 4.

a) Alertness

When we start discussing the dimensions of agility in the supply chain, alertness comes first. The alertness is the characteristic of being attentive in all conditions similar to what happens in sports and the military. The sportsperson and army men are always alert when they are on duty in the battleground. In the case of the COVID-19 pandemic, the Government entities and private sectors which are involved in supply chains of essential commodities should be alert when coronavirus is surging rapidly and different waves are about to attack the people of the various country. The Government authorities also need to be alert for stopping the perfidious black marketing of life-saving drugs and equipment, foods, and other important things.

b) Accessibility

Accessibility is the quality of using the information right away to study the data concerned with an event. In another word, it is the approachability towards facts based on the relevant data. In a pandemic situation, it is imperative to present the related data about the number of active COVID patients, medications, foods, and health care equipment required for them, the time required to deliver these items to respective places, so that the government executives can coordinate and makes plans for delivery of commodities at right places and distribute it at right time.



Fig 4: The five dimensions of the agile supply chain.

c) Decisiveness

Decisiveness is the third dimension of supply agility which is one of the crucial dimensions. It is the potential to decide to execute the plans firmly based on the accessed data and facilities available. Decisiveness plays a crucial role in emergency circumstances like the COVID-19 pandemic as it is the question of life and death. The decision-making time should be as minimum as possible to attain agility in the supply chain during pandemics. In several countries, it was a challenging question of who will and how will make decisions regarding lockdowns and supply of commodities to the people who are in need.

d) Swiftness

Swiftness deals with the proper action decided during the decisiveness phase and the implementation required coping up with changes. The swiftness is the criterion on which the agility relied. For example, as soon as the decision is made to increase the production of medicines and smooth its delivery, all the stakeholders should work hard to achieve the production rate decided. They should be capable of speedily pursuing the new transitions such as new machines, raw materials, required to accommodate the changes that occurred due to pandemics thereby agility can be obtained in supply chains. It is a prerequisite to expediting all the activities necessary for increasing the production as well as delivery of life-saving drugs, equipment, and significant groceries.

e) Flexibility

To completely actualize the agility in supply chain flexibility is the important dimension. Flexibility is the changeability in materials and machines within a specified limit. It is a versatility of manpower to accomplish different tasks for the fulfillment of organizational objectives. As far as the CAVID-19 pandemic is concerned. flexibility in manufacturing and supply chain is a means of framing the agility. The pharmaceutical company manufacturing traditional drugs should be flexible to manufacture drugs for the treatment of COVID-19 patients. Textile factories should be flexible with present circumstances to produce masks and personal protective gowns for people. The steel plants, which are traditionally producing Oxygen gas for metallurgical work, should be flexible and they have delivered medical Oxygen gas to hospitals for COVID-19 patients. With the proper attention and utilization of these five dimensions of supply chain agility, Government entities and private sectors all over the world can mitigate the influence of COVID-19 as minimal as possible, and thereby we can win the war against the uninvited evil.

V. CONCLUSIONS

In the COVID-19 pandemic and lockdown circumstances, the success of delivery and public distribution of essential goods depends on efficacious management and advancement of the supply chain system by utilizing supply chain concepts. To end the dependency on imports from other countries, Indian Government entities and private companies had to develop a framework based on the lean and agile manufacturing concepts. Several authors and researchers are suggesting that India has to establish its supply networks and delivery systems by implementing the lean and agile supply chain concepts thereby it will be capable to deal with pandemics like COVID-19 in the future.

It is believed that the suggestions given in this article will assist the organizations to re-establish their supply chain strategies and re-direct their workforce to deal with the pandemic environment and survive in the long run.

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Shreeyash College of Engineering & Technology



Central Activity

"FACULTY DEVELOPMENT PROGRAM"

Faculty Development Program - 2017 conducted during 03rd January, 2017 to 05th January, 2017. Dr. Satish Patil (Director, BCUD, Dr. B.A.M.U. Aurangabad) Dr. Sunil Kute (Professor, K. K. Wagh IOE & Research, Nashik), Prof. Sachin Lomte (MIT, Aurangabad), Prof. Sandeep Patil (MIT, Aurangabad), Dr. Ram Marlapalle (Executive Vice President - HR, Endurance Techologies Ltd., Aurangabad), Dr. Vihar Rakhunde (President - HR & Admin., Garware Polyesters Ltd., Aurangabad), Dr. P. S. Wakte (Professor & Head - Dept. of Chemical Technology, Dr. BAMU, Aurangabad), Dr. Ravi Damodaran (President - Technology & Strategy, Varroc Engineering Pvt. Ltd., Aurangabad), and Mr. Kerron Vaishnav (Founder Secretary - DISHA International Foundation Trust, Aurangabad) were invited as the Experts and Chief guests for the FDP-2017.

Photographs of the event:









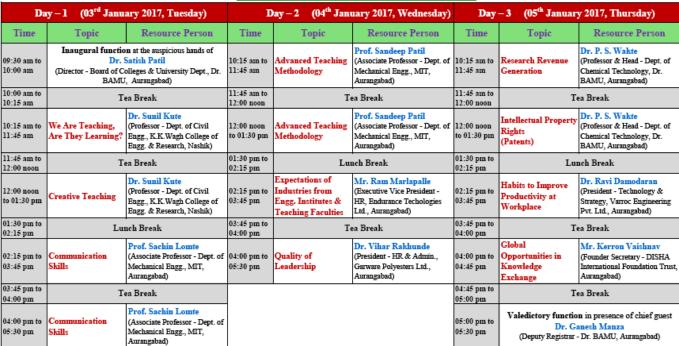
Shreeyash Pratishthan's

SHREEYASH COLLEGE OF ENGINEERING AND TECHNOLOGY, AURANGABAD In Association With



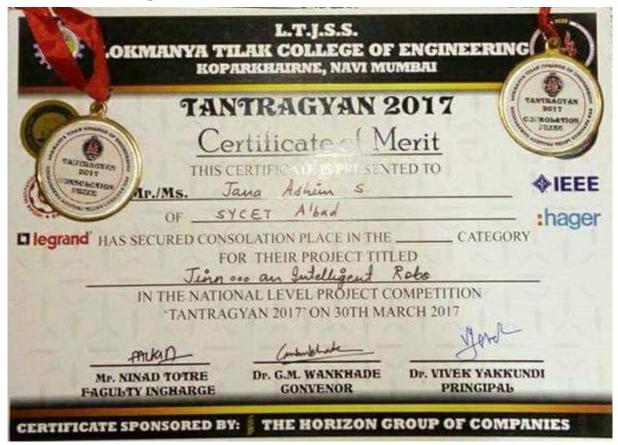
Organizes

3 DAYS FACULTY DEVELOPMENT PROGRAM





- 4. Students participation in various competitions
- 4.1 Students Participation in TANTRAGYAN





4.2. Tata Ready Engineer



4.3 Students Participation in SAEINDIA TIFFAN Competition

SAE-TIFAN

Team Name: TEAM SHREEYANTRA

Team ID : tifan20shreeyantra@gmail.com

College : Shreeyash College Of Engineering

& Technology, Aurangabad



SAE-TIFAN VEHICLE

SAE-TIFAN NEWS

सकाळ

विद्यार्थ्यांनी बनविले कांदा काढणी यंत्र

सकाळ चुत्तसेना

औरमामान्न, ता. ५ : मांगा नावर-पानंतर निद्ध्यारे आप वैसे आणि कावर्णाताती त्याणारे प्रमेड अम पात कमीन आस्थानचा परक आहे. प्रामीण भागातून आहेल्या विद्याल्यांनी हेच हेला बीच्या आध्यात्रिका महाविधात्रात्र्या मांगा व्यवत्या गेव नामको. कमी अचीन सुक्रम गेव वर्ताव्यात्र्यात्रे वाद्यात्री कीतृकाला विद्या अस्ति आसी

उस्त आहेत.

इ. बावस्याहीन आंगीहरूत संग्रहान
विक्रामीआर्था विक्रमीस इमीर्थ्याम
अंग्रह आवर्षिया गर्नेराम इमीर्थ्याम
अंग्रह आवर्षिया गर्नेराम स्मार्थ होत
काहे. या स्मार्थिया विक्रमीत विक्रमीत प्रेमित जार्था विक्रमीत विक्रमीत विक्रमीत इमीर्था भागा भेटी देखन अञ्चास करत. त्यानक याज्यो निर्देशीत करते काव्या विक्रमात याज्यो निर्देशीत करते काव्या विक्रमात क्यां हार्या क्रिया व्यावस्था देखनी क्यां हार्या अंग्रहित करते स्मार्था विक्रमात क्यां हार्या स्मार्थ्य स्मार्था स्मार्थिया क्यां हार्या हार्या देशकार्याच्या विक्रमात क्यां हार्या स्मार्थ्य स्मार्था स्मार्था विक्रमात हार्या ह



औरंगाबाद : कांदा काढणी यंजालोबन श्रीयशचे विद्यार्थी,

औरराज्या संतक्ष्मको २६ विद्यार्थी जारितः या चंत्रासीयत पॅकेविनाची सुर्वियक पुर्वाप्रयात आरली आहे. संचाने नेतृत्व कुणांक गाँउ करोत त्यान्त्र, त्यावीयत प्रावित्यत ठीको, प्रायान्त्र प्रवाद स्वाद्यान्त्र स्वाद्यान्य स्वाद्यान्त्र स्वाद्यान्य स्वाद्यान्त्र स्वाद्यान्त्र स्वाद्यान्त्र स्वाद्यान्त्र स्वाद्यान्य स्वाद्यान्त्र स्वाद्यान्त्य स्वाद्यान्त्र स्वाद्यान्त्र स्वाद्यान्त्र स्वाद्यान्त्र स्वाद्यान्त्र स्वाद्यान्त्र स्वाद्यान्य स्वाद्यान्त्र स्वाद्यान्त्य स्वाद्यान्य स्वाद्य स्वाद्यान्य स्वाद्य स्वाद्यान्य स्वाद्यान्य स्वाद्यान्य स्वाद्यान्य स्वाद्यान्य स्व

वस्तवराज मंगरहते, आपार्थ कार. एस. पवार, संचारकंत प्रमावतः मायाहतकर, विभागवसुष्य सोविद हार्थ पार्थ कितावस्त केते. आ स्वस्तवाद विश्वते, आ काहित पार्टीक, आ अधिकाश करवसीके, आ नार्थेश डींगरे, आ अधीक अवस्तिके, प्रा. जीवके बेरायुक्त मा गीयक केश्यार्थ पार्थ पुक्रक्वर मेटराय

TEAM SHREEYANTRA **FACULTY ADVISOR** Sakharam A. Shimple Yashoda A. Kale **TEAM CAPTAIN** Kunal A. Gonte ANALYSIS MANUFACTURING MARKETING **FINANCE & DESIGN TEAM** TEAM TEAM PROCUREMENT TEAM **Bhagwat Magar** Gajanan Taur Ishwar Chaudhari Dnyaneshwar Kunal Gonte Thombre Omkar Salunke Ratan Kshirsagar Piyush Srivastava Shivaji Pawar Saurabh Sangave Aarati Dorle Sagar Somase Sagar Agharde Vishwambhar Joshi Aditya Suryawanshi Tushar Idhate Komal Wagdare Shubhangi Pawar Pallavi Padam Nilesh Ghaywat Mahendra Dound Yogita Gaikwad Harish Tandale Sonaji Rathod Tanuja Kale



Shreeyash college of engineering and technology, Aurangabad



Project Title-: Design and Development of self propelled onion harvesting machine

Description: This invention provides self propelled onion harvester by using adjustable digging angle. Depth of harvesting is adjustable to the operator whenever required. This project had successfully participated in SAE India TIFAN competition



GROUP PHOTO OF SAE-TIFAN TEAM MEMBERS













SAE-TIFAN WORKSHOP FACILITIES





































College Facilities - CNC, Vertical Drilling, Surface Grinding, UTM, Lathe, Arc Welding, Horizontal Milling, TIG Welding.

Outside Facilities- VMC, Pipe Bending, Gear Hobbing, Leaser Cutting, Metal Testing Machine

4.4 Students participation SAE-BAJA



TECHNOLOGY, AURANGABAD





48.19

TEAM

>>> SHREEYASHTRA 2.0

	OLD TEAM ID : CAR NUMBER :	18085 46
	OVERALL SCORE	451.15
ND	OVERALL RANK	13
	☐ ENDURANCE SCORE	247.06
	☐ ENDURANCE RANK	6
	□ AWARDS	NIL
	☐ SUSPENSION & TRACTION	0 (NA)
	☐ MANEUVERABILITY	0 (NA)
	□SLED PULL	63.1

□ACCELERATION

TEAM COMPOSITION AND WORK ALLOCATION Captain : Aneesh Jayashankar Faculty Advisor: Prof. Kapil Patil No.of old members: 05 Vice-Captain: Saurabh Kulkarni Prof. A. U.Karadkhele No.of new members:20 ROLLCAGE **BRAKES** SUSPENSION TRANSMISSION STEERING Sachin Thombre Aneesh Jayshankar Rohit Kadam Madhusudhan Wani Saurabh Kulkarni Samadhan Bachhav Ganesh Jadhav Pavan Dhakne Amar Tejas Avishkar Jadhav Akshay Krishna Shubham Akshay Rahul Sumant Shantanu Khilare Shailesh Suraj Kadam Bandu Shinde Sarika Maya Nandini Supriya **Outside Facilities College Facilities**



<u>College Facilities</u>: CNC, UTM, TIG Welding, Vertical Drilling, Lathe, Milling, Grinding, Spot welding, Arc welding, etc.



<u>Outside Facilities</u>: VMC, Pipe bending, Gear hobbing, Leaser cutting, Metal testing machine.





औरंगाबाद : बाहा स्पर्धेत यशस्वी झालेली श्रीयश महाविद्यालयाची श्रीयस्त्र टीम.

'बाहा'मध्ये श्रीयशचा संघ सहावा

सकाळ वृत्तसेवा

औरंगाबाद, ता. १८: आयआयटी रोपर (पंजाब) येथे झालेल्या बाहा एसएई स्पर्धेत श्रीयश अभियांत्रिकी आणि तंत्रज्ञान महाविद्यालयाच्या 'श्रीयश टीम'ने सहावा क्रमांक पटकावला आहे. देशभरातून ६० संघांनी सहभाग नोंदविला होता.

सोसायटी ऑफ ऑटोमोटिव्ह इंजिनिअरिंगतर्फे (एसएई) बाहा स्पर्धा भरवली जाते. सुरवातीला व्हर्च्युअल स्पर्धेत ४०० संघांनी सहभाग नोंदवला. यातून २०० संघांची निवड करण्यात आली होती. त्यातील १४० संघांची स्पर्धा पहिल्या टप्प्यात इंदोरमध्ये झाली. त्यानंतर रोपर येथील स्पर्धेत श्रीयश टीमने सहभाग घेतला.

विद्यार्थ्यांनी तयार केलेल्या

गाडीची विविध तांत्रिक पातळीवर चाचणी केली जाते. त्यानंतर मुख्य स्पर्धा इन्डग्रुरन्स रनमध्ये सहभागाची परवानगी मिळते. चार तासांत खडतर लॅप्स पूर्ण करायचे असतात. यात श्रीयश टीमने २२ लॅप्स पूर्ण करीत देशभरातून सहावा क्रमांक मिळविला. सुमंत उखाली याने गाडी चालवली. कर्णधार विशाल वाघ होता, तर उपकर्णधार अनिश जयाशंकर होता.

संस्थेचे अध्यक्ष बसवराज मंगरुळे, संचालक डॉ. उत्तम काळवणे, प्रभाकर माशाळकर, प्राचार्य डॉ. आर. एस. पवार, यांत्रिकी विभागप्रमुख गोविंद ढगे, आस्थापना अधिकारी दीपक पवार यांनी टीमचे मार्गदर्शक डॉ. कपिल पाटील, प्रा. अविनाश करडखेले यांच्यासह टीममधील १९ विद्यार्थ्यांचे अभिनंदन केले.



This is to certify that

REVNATH SHINDE

representing

Shreeyash College Of Engineering And Technology, Aurangabad

has participated in the Virtual SAJA SAEINDIA 2018, organized by SAEINDIA

on 13th & 14th April 18 at Chitkara University, Punjab.

We wish him all the best for the future endeavours.





4.5 Students participation Smart India Hackathon Competition 2019-2020

SHREEYASH PRATISHTHAN'S Shreeyash Technical Campus





SHREEYASH COLLEGE OF ENGINEERING & TECHNOLOGY, AURANGABAD

Project Title	Name of Team Leader
Energy Management System with IOT	Rushikesh Warade
Tracking and Monitoring the child with help of IOT	Pavan Shinde
App development with help of flutter	Sagar Jangale
Smart Farming using IOT	Mohini Kharate



Project Title	Name of Team Leader
nti Theft System for Two Wheelers	Sanket Dhopate
Development of Kisan Mitra App	Yogeshri Jadhav





SHREEYASH PRATISHTHAN'S Shreeyash Technical Campus



SHREEYASH COLLEGE OF ENGINEERING & TECHNOLOGY, AURANGABAD



Project Title

Name of Team Leader

Crop Disease Prediction with Help of ML

Mayuri Swami



Project Title

Name of Team Leader

Students Grievance Redressal Mechanism App

Development

Vaishnavi Kulkarni





Dr. R. S. Pawar

Principal



SHREEYASH PRATISHTHAN'S SHREEYASH COLLEGE OF ENGINEERING & TECHNOLOGY, AURANGABAD

SataraParisar, Beed By-Pass Road, Aurangabad -431010 (M.S.)

Department of Computer Science & Engineering

Academic Year - [2019-20]



Smart India Hackathon 2020

Sr. No.	Project Title	Name of Team Leader	Funding
1	Energy Management System with IOT	Rushikesh Warade	Self Funded
2	Tracking and Monitoring the child with help of IOT	Pavan Shinde	Self Funded
3	App development with help of flutter	Sagar Jangale	Self Funded
4	Smart Farming using IOT	Mohini Kharate	Self Funded
5	Anti Theft System for Two Wheelers	Sanket Dhopate	Self Funded
6	Development of Kisan Mitra App	Yogeshri Jadhav	Self Funded
7	Crop Disease Prediction with Help of ML	Mayuri Swami	Self Funded
8	Students Grievance Redressal Mechanism App Development	Vaishnavi Kulkarni	Self Funded

Sol HOD(CSE)



5. Student's participation in technical trainings



Red Hat, Inc. hereby certifies that

DEEPAK VITTHAL NAGRE

has successfully completed all the program requirements and is certified as a

RED HAT CERTIFIED SYSTEM ADMINISTRATOR

Red Hat Enterprise Linux 7

RANDOLPH, R. RUSSELL

DIRECTOR, GLOBAL CERTIFICATION PROGRAMS

2016-02-12 - CERTIFICATE NUMBER: 160-024-998

ESTO SE TE SERVITORIE ITOMBER: TOS SEA 770



Course completion Certificate.

Certificate No:SAP/SYCET/2018/065

Date of Issue: 27/09/2018

We hereby confirm that

Renuka Manohar Patil

has attended and completed SAP ABAP Basics with NW 7.5

Certificate obtained via SAP Education's Site License Program

Authorized Signatory







MINION DISCRIPTION AND ADMINISTRATION OF THE SERVICE OF THE SERVIC

6. Development of Laboratories and Purchasing of Equipment's/Machinery Sample Copy of tax invoice and goods received receipt for Renewable Energy Lab development

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FEDANT ENERGY SOLUTIONS LLP	Invoice No.	Dated
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E-Mail :sales@vadantenergysolution.com	27	IMMEDIATE
	Supplier's Ref.	Other Reference(s)
	SYCET/EE/RES/15-16/PO/050	Other Reference(s)
Buyer	Buyer's Order No.	D
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Tax I	nvoice	(Original)
X 122 VITTHAL MANDIR ROAD BAJAJ NAGAR, WALUJ, AURANGABAD E-Mail :sales@vedantenergysolution.com Buyer SHREYAS COLLEGE OF ENGINEERING & Management Satara Pariasar Aurangabad	Invoice No. 27 Delivery Note 27 Supplier's Ref. SYCET/EE/RES/15-16/PO/050 Buyer's Order No. SYCET/EE/RES/15-16/PO/060 Despatch Document No. Despatched through BY HAND Terms of Delivery	Dated 9-May-2016 Mode/Terms of Payment IMMEDIATE Other Reference(s) Dated

SI No.	Description of G	oods	Quantity	Rate	per	Disc. %	Amount
1	Supply of 1KWp Solar Power System Includes Solar Ups 600VA /12V-2 Nos Along with Polycrystaline Solar PV Cells- 11nos (Detailed BOQ Affached Along with This Propsal) Expriments on 1) Single PY Module LV & P-V Characteristics (with Radiation & Tempreture Changing Effect) 2)L-V & P-V Characteristics with Series & Parellel Combination of Modules 3) Effect of Shading & Tilt Angle 4) Battery Changing & Discharing Characteristics 5) Demo of Only AC Lode System With & Without Battery 6) Demo of Only DC Lode System with & Without Battery 7) Combine Ac & Dc Load System	Genration & Training	1 numbers	3,04,000.00	runbes	3%	(2,94,880.00

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Head OND epartment Electrical Engineering Surceyash College Of Engg. & Toch. Aurangabad

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	VEDANT ENERGY SOLUTIONS LLP X 122 VITTHAL MANDIR ROAD BAJAJ NAGAR, WALUJ, AURANGABAD E-Mail:sales@vedantenergysolution.com	Invoice No. 0026	Dated 9-May-2016
		Delivery Note 0026	Mode/Terms of Payment IMMIDIATE
		Supplier's Ref. SYCET/EE/RES/15-16/PO/050	Other Reference(s)
	Buyer	Buyer's Order No.	Dated
	SHREYAS COLLEGE OF ENGINEERING & Management Satara Pariasar Aurangabad	SYCET/EE/RES/15-16/PO/050	5-Feb-2016
		Despatch Document No.	Dated
			9-May-2016
		Despatched through	Destination
		BY HAND	AURANGABAD
		Terms of Delivery	

SI No.	Description of Goods	Quantity	Rate	per	Disc. %	Amount
1	Software Development Charges	1 numbers	50,000.00	numbers	3 %	48,500.00
	Service Tax Payable @ 14% SWACCH BHARAT CESS @ 0.5% Round Off		14 0.50			6,790.00 242.50 0.50

INR Fifty Five Thousand Five Hundred Thirty Three Only

Company's VAT TIN : 27445287273V

Declaration

I/WE hereby certify that my/our registration certificate under the Maharashtra Value Added Tax Act 2002 is in the force on the date on which the sale of goods specified in this tax invoice is made by me / us and that the transactions of the sale covered by this "TAX INVOICE" has been effected by make and it shall be accounted for the turnover of sales. me/us and it shall be accounted for the turnover of sales while filling of return and the due tax, if any payable on the sale has been paid or shall be paid.

Company's Bank Details Bank Name : IDI : IDBI BANK LTD A/c No. 0633102000003902

Branch & IFS Code : NEW OSMANPURA AURANGABAD & IBKLOGG0833
for VEDANT ENERGY SOLUTIONS LLP

Maintainence or Repair

Tax Code: UOAA0245

Authorised Signatory

This is a Computer Generated Invoice

Shreeyash Pratishthan's



Shreeyash College of Engineering & Technology, Aurangabad





(An ISO 9001 : 2008, ISO 14001:2004 EMS & ISO 18001:2007 OHSAS, Certified Institute)

Approved by : AICTE, New Delhi. Recognised by : Govt. Of Maharashtra & DTE, Mumbai Affiliated to : Dr. Babasaheb Ambedkar Marathwada University, Aurangabad. (Institute Code 2112)

SYCETEE RES 15-16 PO 050 ...

Date: 05/02/2016

Date: 29th Jan, 2016

To,

M/s, Vedant Energy Solutions LLP X-122, Vithal Mandir Road, Bajaj Nagar, Waluj, Aurangabad

Kind Attention :- Mr. Kailash Deshmukh (Contact No.- 8888875805

Subject: Supply of the lab equipments for Renewable Energy lab at Shreeyash College of Engineering & Technology Aurangabad.

REF: Our Enquiry dated- 10/01/2016

Your quotation Ref. no VES /1-16/0015 dated 18/01/2016

The undersigned is pleased to accept the rates quoted by you & request you to please Sir. arrange to supply the following Equipments as per the specifications, terms & conditions stipulated there in.

You are requested to please acknowledge the receipt of the order & convey your acceptance within week's time for supply.

Encl.-1. List of equipments.

Chairman

(Er.Basawaraj Mangrule) Shreeyash Pratishthan,

Aurangabad.

Copy to - 1) Dept.of Electrical Engineering through Principal & Director campus for follow up & needful.

2) Accounts Section for needful action.

3) Stores In charge for record.

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List of equipment:

Sr.No.	Description	Qty.	Rate per unit(Rs)	
1	Supply of 1 KWp Solar Power genration and Training System Includes solar ups 600VA/12V -2 Nos along with Polycrystaline solar PV cells -11 Nos (Detailed BOQ attatched along with this proposal)	01 No's	3,04,000	
2	Software development charges	01 No's	50,000	
3	32" LCD display for voltage and current measurement *	01 No's	25,000	
	3,79,000			
	Discount @3%		11,370 🕸	
	3,67,630			
T	22,989			
	TAXES :- 5% VAT (3,19,130) + 14.5% Service Tax (48,500) Total Amount			

(Three tack Ninety thousand Six hundred nineteen rupees only)

General terms & Conditions:-

LTaxes

a) VAT @ 5% .for Rs (3,19,130) .

b) Service Tax @ 14.5% for Rs (48,500)

2. Delivery Period - Within 30 days from the date of this order.

3.FOR Destination – At the site of Shreeyash College of Engineering & Technology Gat no. 258 Satara Parisar, Beed Bypass Aurangabad 45.

4. Specifications of Material – The equipment supplied should be strictly as per specifications given in the order otherwise material will be rejected.

5. Payment – 50% advance along with PO & balance after satisfactory demo & working of the equipment.

6. Legal Dispute - Regarding any dispute, if arises, the decision of the undersigned will be final & will be binding on you. Court of jurisdiction will be Aurangabad for any legal dispute.

Chairman.

(Er.Basawaraj Mangrule) Shreeyash Pratishthan.

@ As continued

Aurangabad

24/22

Date: 27th June 2016

Office Note

Sub: Release of payment for Renewable energy lab.

Ref: 1) PO number Sycet/EE/RES/15-16/PO/050 dated 5.02.2016 2) M/s Vedant Energy Solutions LLP, Waluj, Aurangabad

Invoice No 26 & 27 dated 9th May 2016.

With reference to the purchase order as mentioned above, the following equipments have been received, installed and successfully tested by department of electrical engineering in the presence of Prof.J.S.Shastri and Prof. Amit Kumar.

As per the conditions laid in the purchase order (as referred) it is kindly requested to release the remaining payment for M/s Vedant Energy Solutions LLP, Waluj, Aurangabad.

As against total order of Rs3,35,086.00 as per our terms conditions we have released 50% amount of Rs.1,83,815.00

Balance amount of Rs.1,51,271.00 may be released.

Please find PO & Invoice attached.

chase Cordinator

(Prof. G.D. Karanjgokar) Hospital (Dr.R.S. Pawar)

a Steet of Period Resident

Head & Dent training

Director (Campus)

(Dr.U.B.Kalwane)

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7. Expert talk on Start-Up Entrepreneurship and its benefits.



Shreeyash College of Engineering & Technology



Name of the event: Expert talk on Employee Stock Options for Start-ups & its benefits

Date of the event: 11th October 2019

Class: All students

Summary of the event: One day workshop on "Employee Stock Options for Startups & its benefits" was arranged at our college by Mr. Ashfaque Aalam, Executive Director, Scilhouettez Pvt. Ltd, MIDC Waluj, Aurangabad. He explores the concept of start up right from origin and how to continue it. He say Startup India Hub is a one-stop platform for all stakeholders in the Startup ecosystem to interact amongst each other, exchange knowledge and form successful partnerships in a highly dynamic environment. Ashfaque Sir also given brief idea about how to become an entrepreneur and what are the ways to get avail benefit of government schemes. There were some success stories which sir discussed with some hands on exercises. In this expert talk all faculties of Electronics and telecommunication engineering department were present and get knowledge about how to develop an idea and how to startup and get benefit of Startup India schemes. The session was very interactive and knowledgeable. We all get benefited and upgraded.

Outcome:

- ➤ Due to this expert talk, we get updated regarding startup
- > Students aware about startup schemes and basic requirement for the same.
- Confidence to make our idea as product & become an entrepreneur.







8. Conducted Technical Training Session



Shreeyash College of Engineering & Technology



Department of Electronics and Telecommunication Engineering

Name of the event: Webinar

Date of the event: 6th May 2021

Class: SE, TE & B.E.

Expert / Guest of the event: Dr. Zakee Ahmed (Assistant Professor, ETC Dept. PICT Pune)

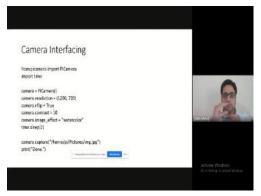
Summary of the event: This is Expert talk on "Development of Projects using Raspberry-Pi". Prof. Zakee Ahmed has focused on how to prepare a project and implement own idea using Raspberry-Pi board. He also explain all the key features and the main parts of Raspberry-Pi board. He has guided the students thoroughly about the importance of project work implementation with examples. Also He has cleared the queries raised by the students.

Outcome: Students come to know about the importance of project development through Raspberry-Pi board. Also they come to know about the basics theory behind it.

Photographs of the event:









Develop the Research Culture among Students (Paper publication by student)



International Journal for Research in Engineering Application & Management (IJREAM) ISSN: 2454-9150 Vol-0

Need of Computerized Early Fire Detection System

Renuka Hingolikar¹, S.S.Gadekar², S.P.Kharde³

¹PG Student, ²Asst.Prof., ³HOD, Dept. of ETC, Shreeyash College of Engineering and Technology, Aurangabad (MH), India

Abstract: Every year, fire is a common calamity that claims thousands of lives and causes incalculable material damage. As a result, early fire detection has become increasingly vital in order to defend against this hazard. In 2015, 17,700 people died in fires, a number that has steadily decreased each year, with just 10,915 people dying in fires in 2019. In the recent year, different computerized systems are developed, which is very useful to control the deaths due to the fire accidents. This paper provides the important of computerized fire detection system and also gives the theoretical survey on the systems which are developed in the recent year.

Keyword: Fire Detection System, Hazard, Computerized.

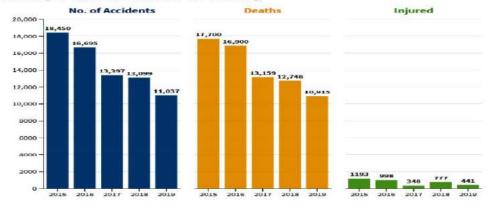
INTRODUCTION

In the industrial and process industries, vision-based fire detection and automated suppression (VFDAS) systems are one of the most significant mechanisms. It is especially important in businesses that rely on oil, gas, and petrochemicals as fuels. To avert fire accidents and loss of life and property, a quick automated detection system must be available.VFD (vision-based fire detection) system has a number of advantages over traditional fire detection technologies, including quick response, non-contact detection, and no installation restrictions. Sensors are currently used in the majority of fire detection systems to detect smoke, temperature changes, and other events [2].It is vital to build a monitoring system that can detect early flames in order to prevent fires and slow their spread. The rapid development of urban monitoring systems provides the framework for camera-based fire detection, and establishing a camera-based automatic fire monitoring

algorithm may achieve 24/7 automatic fire monitoring without interruption, which considerably decreases personnel expenses.

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In 2019, there were 11,037 fire accidents registered across the country, according to the ADSI-2019 data. In comparison to 2018, the number of such recorded fire accidents decreased by roughly 16 percent. The reduction was more pronounced than the year before, when it was roughly 2%.In addition, the number of people injured in fires has decreased by more than half, from 1193 in 2015 to 441 in 2019. During this time period, however, the least number of people were harmed as a result of fires. According to the statistics presented in ADSI reports, the overall number of fire accidents has decreased over the last five years in all locations of occurrence. Figure 1 shows the Fire Accidents in India (2015-2019).



DOI: 10.35291/2454-9150.2021.0399

Figure 1Fire Accidents in India (2015-2019)



III. LITERATURE SURVEY

Several approaches for detecting fire in videos or photos captured by typical video security cameras have been proposed in recent decades. All forms of fire detection use some form of color evaluation. Color information can be recovered using chromatic segmentation techniques that use numerous color spaces. Manjunatha K.C. et al. [2] describe computer vision-based automated fire detection and suppression system for manufacturing businesses and it plays a critical part in the Onsite Emergency System (OES), which can help the industry avoid accidents and losses. The exact placement of fire pixels in the image frame is determined using a Neuro-Fuzzy algorithm. Based on the region of the fire and the intensity values of the fire pixels, fuzzy logic is proposed once more to determine the valve to be controlled.

Faming Gong et al. [3] have developed a novel detection method based on flame multifeature fusion. As a fire preprocessing stage, we merged the motion detection and color detection of the flame. In screening the fire candidate pixels, this strategy saves a significant amount of computing time. Second, despite its irregularity, the flame has a considerable resemblance to the image's sequence. In order to acquire the spatiotemporal information of the flame centroid, we calculated the centroid of the flame region in each frame of the image and included the temporal information. Then, to improve recognition accuracy, we retrieved information such as spatial variability, shape variability, and area variability of the flame. Finally, we trained using a Support Vector Machine (SVM), finished analyzing candidate fire photos, and accomplished automatic fire monitoring. According to the results of the experiments, the proposed method's right rate is close to 95.29 %, demonstrating that it is more accurate and stable.

A video-based early fire detection system is presented by Pedro Santana et al. [4]. The obstacles associated with the actual deployment of the vision system are highlighted. Most importantly, background subtraction is done in a windowed manner for better accuracy, an attentive mechanism is used to focus a computationally expensive frequency analysis of potential fire regions, and interaction with people detection and tracking system is included to allow model-based false alarm rejection. The camera-world

mapping is approximated using a GPS-based learning calibration technique, and new color-based models of fire's look as well as a new Wavelet-based model of fire's frequency signature are presented. The model's applicability to real-life applications is demonstrated by a 92.7 percent average success rate at a processing rate of 10 Hz.

Mohammad Sultan Mahmud et al. [5] describe a smart fire detection system that can alert the appropriate authorities even before the fire breaks out. A signal processing unit, an image processing unit, and a GSM module unit have been combined in a model. To gain more accurate detection, a machine learning approach is adopted and compared to the result. A multi-level approach for fire detection that chromatic information patterns, shape examines randomization, and fire optical flow estimation proposed by Arnisha Khondaker et al. [6]. To extract the regions of interest, the decision function of fire pixels based on chromatic information first employs majority voting among state-of-the-art fire color detection algorithms. Finally, an upgraded optical flow analysis technique evaluates turbulence to establish the existence of fire. We use videos from the Mivia and Zenodo datasets to assess the proposed model's performance. These datasets offer a varied collection of scenarios, including indoor, outdoor, and forest fires, as well as videos with no fire. For our test dataset, the proposed model has an average accuracy of 97.2 percent.

K.K. Wong et al. [7] use video flame detection analyses to offer segmentation and recognition methods. The Otsu multi-threshold approach can provide clear flame only images when used with Rayleigh distribution analysis. To detect specific image types, the Nearest Neighbour (NN) method can be utilized. In the segmentation of flame photos, Otsu's method's multi-threshold algorithm and the Rayleigh distribution analysis method (modified segmentation algorithm) can be employed. The updated segmentation technique, on the other hand, can be improved to extract pool fire photos using the best threshold values. Following this segmentation, the Nearest Neighbor (NN) method can be utilized to recognize pool fire photos using the centroid analysis technique. The table 1 gives the literature survey on Methods, Algorithm or Techniques used for fire detection system in the recent

Table 1 Methods, Algorithm or Techniques used for fire detection system.

r. No.	Reference	Method/Algorithm/Technique Used	Accuracy
1	Manjunatha K.C. et al. [2]	Neuro-Fuzzy algorithm	99 %
2	Faming Gong et al. [3]	Support Vector Machine (SVM)	95.29 %,
3	Pedro Santana et al. [4]	Wavelet-Based Model	92.7 %
4	Arnisha Khondaker et al. [6].	Enhanced LKT Optical Flow Analysis Algorithm	97.2 %
5	Jareerat Seebamrungsat et al. [8]	HSV and YCbCr Color Models	90 %
6	Pedro Gomes et al. [9]	Wavelet-Based Model	93.1 %
7	Kumarguru Poobalan and Siau-Chuin Liew [10]	Segmentation Technique	80.64 %

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8	Turgay Çelik et al. [11]	Fuzzy Logic	99.00 %
9	Raam Pujangga Sadewa et al. [12]	Convolutional Neural Networks (CNN)	92 %
10	Sally Almanasra and li Alshahrani [13]	Alternative Image-Based Algorithm	95.10 %
12	B. Triveni et al. [14]	RGB color model Algorithm	80.64 %
13	S. Sree Southry et al. [15]	Supervised Multi-Model Image Classification Algorithm (SMICA)	98.38 %
14	John Adedapo Ojo and Jamiu Alabi Oladosu [16]	Support Vector Classifier	99.30 %
15	Bo-Ho Cho et al. [17]	statistical color model	85 %

IV. CONCLUSION

One of the changeable risks that cause property destruction is fire. Many academics are working on early warning systems that help to reduce the effects of fire damage. Many existing image-based fire detection systems, on the other hand, can perform effectively in a certain field. Different computerized technologies have been created in the last year that are highly useful in reducing the number of deaths caused by fire accidents. This study discusses the significance of computerized fire detection systems and provides a theoretical overview of systems that have been created in the last year.

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