Department of Technical Education
Government Polytechnic, Harihar

Format- 1

1. Capstone project Scope Document

Capstone project Title: Smart Factory

Group Members: Gagan M Kakol (170EC20017),
Ishrath Khanum (170EC20020),
Karthik B M (170EC20021),
Kavya N (170EC20022),

Problem Statement: To Make a Smart Factory using Microcontroller, Sensors, Actuators.

Objectives:

- Implement predictive maintenance to prevent equipment failures and reduce downtime.
- Improve product quality through real-time monitoring and quality control.
- Optimize production processes to increase throughput and reduce waste.
- Enhance worker safety by monitoring and preventing accidents.

Capstone project description: In this project we Sensors and Actuators to improve work efficiency and workers safety in the Factory

Capstone project Deliverables: A User Interface for system that displays the real time data of running factory remotely access the data.

Constraints: Budget constraints may limit the selection of hardware components, technical limitations and compatibility issues may arise.

Estimated Capstone project Duration: 12 Weeks (3 Months)

Estimated Capstone project cost: Rs. 3850/-

Date

Signature of the student

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Format- 2

Capstone project Name: Smart Factory
Capstone project Members: Gagan M Kakol, Ishrath Khanum, Karthik B M, Kavya N

2.Work Breakdown Structure - Deliverables

- Capstone Project Lead – Gagan M Kakol
- Capstone Document Lead – Kavya N
- Development Lead - Ishrath Khanum , Karthik B M

1. **Project Initiation**
    - Identify the need for the project
    - Develop a project charter
    - Develop project plan and schedule
2. **System Design**
    - Research THE technology and softwares for project
    - Identify and select hardware components
    - Develop system architecture and interface design
3. **Hardware Implementation**
    - Install hardware components
    - Configure sensors and actuators
    - Develop conveyor belt
    - Monitor hardware performance
4. **Software Development**
    - Develop a software for Smart Factory
    - Develop user interface software
    - Test and optimize system performance
5. **User Manual and Documentation**
    - Develop user manual and system documentation
    - Prepare system demonstration and training materials
    - Finalize project report and presentation
6. **Project Closure**
    - Conduct final testing and quality assurance
    - Deliver project deliverables to stakeholders
    - Close out project and conduct post-project review

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Capstone project Name: Smart Factory

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3. Time – line Schedule

Week-1: Discussing about our capstone project with the reference of marketing scope.
Week-2: Planning & designing of our project-“ Smart Factory" & related collecting document of our project
Week-3: To start basic requirement of project as per requirement & configuration.
Week-4: To by the electronic interfacing modules like controller, sensors, fabrication materials
Week-5: To start a programing for in our project we are using "ARDUINO IDE” software.
Week-6: As per programming to create as separate or individual components circuit diagram with reference of coding
Week-7: To complete coding part then finish up necessity of a fabrication works
Week-8: To connect the hardware components with the controller as per coding instruction then finalize our project
Week-9: To start necessity document preparation for individual components and make a Report of Week-11Finalize our Project designing, testing, and Plagiarism
Week-10: To check the report as per DTE plagiarism to check the Plagiarism and reduce up to 35%
Week-11: Finalize our Project designing, testing, and Plagiarism
Week-12: Planning for PPT and demonstration

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Capstone project Name: Smart Factory

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4. Cost breakdown structure

Sl. No	Components	Quantity	Cost
1	NodeMCU	2	1000
2	Load Cell	1	500
3	Flame Sensor	1	200
4	IR Sensor	1	200
5	DHT11	1	200
6	Mini Fan	1	200
7	Buzzer	1	100
8	Water Pump	1	200
9	DC Motor	2	300
10	jumpers	1set	250
11	Smoke Sensor	1	200
12	Wooden Board	1	200
13	Sun Board	1	200
Total			3850

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Capstone project Name: Smart Factory

Capstone project Members: Gagan M Kakol, Ishrath Khanum, Karthik B M, Kavya N

5. Risk Analysis

- Cybersecurity risks: Smart factories are vulnerable to cyber attacks that could compromise sensitive data, intellectual property, or disrupt operations.
- Technical failures: Smart factories rely on advanced technologies such as IoT devices, AI algorithms, and big data analytics.
- Employee resistance: The implementation of a smart factory could be met with resistance from employees who are not familiar with new technologies or processes.
- High upfront costs: Implementing a smart factory can be expensive, requiring significant investment in advanced technologies and infrastructure.
- Integration challenges: Smart factories require integration between various systems and technologies, which can be challenging to achieve.
- Regulatory compliance: Smart factories may be subject to regulatory compliance requirements, such as data privacy regulations, environmental regulations, or safety regulations.

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Capstone project Name: Smart Factory
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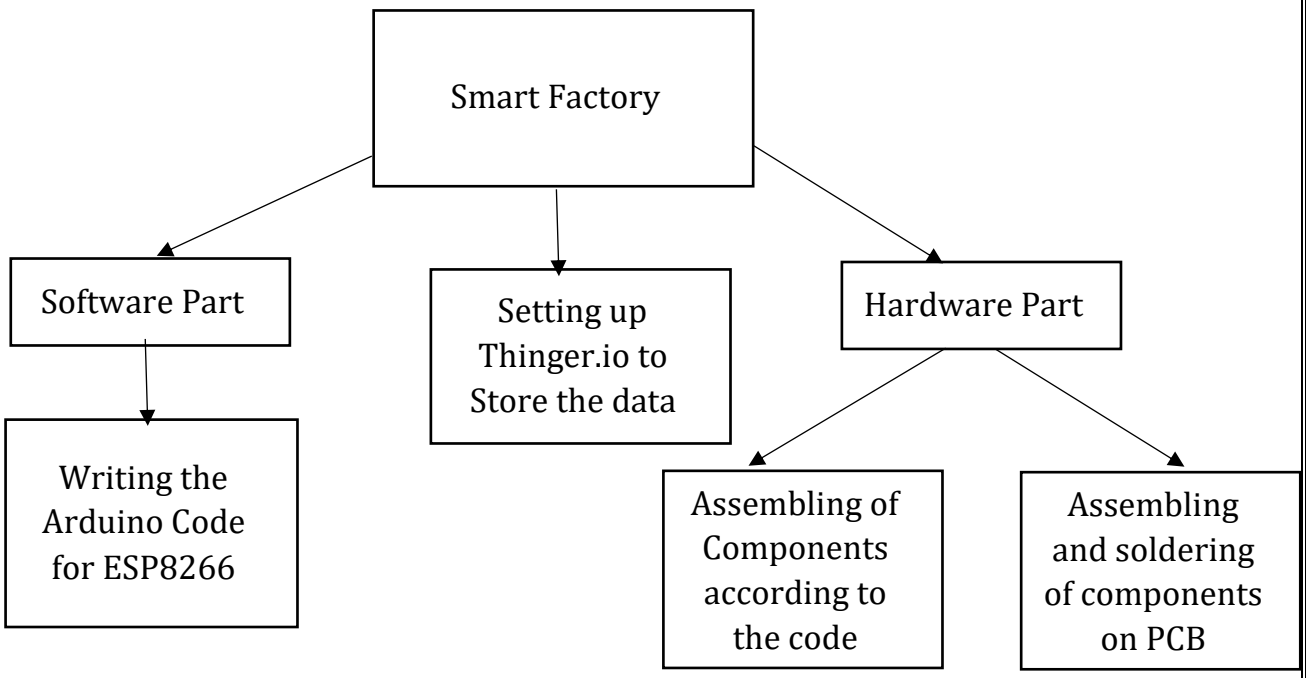
6. Methodology & Literature Survey



Sl. no	Project Title	Components Used	Advantages	Disadvantages	Conclusion
1.	Smart Factory	NodeMCU, Loadcell	Quality Control	High cost	Improves Workers Safety
2.	Smart Railway Gate	ESP8266, servo motor, HCSR04	Automate the gate opening	Chance of false alerts	Reduces accidents
3.	Smart irrigation system	Moisture sensor, Nodemcu	Reduces the	High cost for implementation	Improves harvesting

			watering problems		
4.	Home security system	Solenoid lock, nodemcu	Secure of informati on	Privacy issues	Helps in decreasing the theft
5.	Smart garbage	Arduino,dist ance sensor	Stops decaying	High cost for implementation	Cleans the city