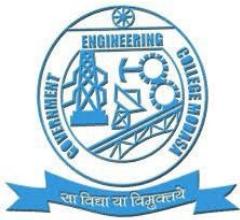


# GUJARATTECHNOLOGICALUNIVERSITY



## Government Engineering CollegeModasa (Affiliated with GTU)

### A Project Repor t On **INDUSTRY4.0AUTOMATION** **(programmablecontroller)**

Prepared as a part of requirements for  
subject  
of DESIGN ENGINEERING-1A  
B. E.III, Semester –  
IV(E.CEngineering)

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## **ABSTRACT:**

An automated machine is increased in this globalised world. This project outlines the timer controller for multiple machines. Over the years, the demand increases for high quality, greater efficiency and automatic machines. In this project, the main application is control of Oven operation and movement of conveyer using PLC. The initial phase of the project focuses on passing the inputs to the oven at a required temperature, so as to constantly maintain a particular temperature in the ovens. The project mainly focuses on level, pressure and flow control at the various stages of the project plant. Thus the temperature in the ovens is constantly monitored and brought to a constant temperature as required by the project plant. The automation is further enhanced by constant monitoring using SCADA screen which is connected to the PLC by means of communication cable. By means of tag values set to various variable in SCADA the entire process is controlled as required. This project has proved to be very efficient practically as the need for automation grows day by day. SCADA (Supervisory Control and Data Acquisition) system monitors the plant and helps reduce the errors caused by humans. While the SCADA is used to monitor the system, PLC (Programmable Logic Controller) is also used for the internal storage of instruction for implementing function such as logic, sequencing, timing, counting and arithmetic to control through digital or analog input/output modules and various types of machines processes. Systems are used to monitor and control a plant or equipment in industries such as telecommunications, water and waste control, energy, oil and gas refining and transportation.

## **1. INTRODUCTION**

Originally PLCs were designed as a replacement for hard-wired relay and timer logic control systems. PLCs have the great advantage that it is possible to modify a control system without having to rewrite the connections to the input and output devices, the only requirement being that an operator has key in a different set of instruction. The result is a flexible system which can be used to control systems which vary quite widely in their nature and complexity.

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# **CHAPTER 1:**

## **INDUSTRY AUTOMATION**

### **1. Problemdefinition&PossibleSolution:-**

In industry we require more and more work to do our specified work, and we have to provide their demanded salary to do our work. It is not easy to find as many number of workers as we needed. We can't provide their demanded salary. By using this machine we don't required many number of worker, so it provides less number of worker. And working efficiency of worker is less and working efficiency of the automated machine is high. Worker will finish the task with more time consumption and machine will finish the task with less time consumption. Some machine provide best quality work in less time.

### **2. ProjectOverview:-**

This Automatic machine is design for industrial uses and further it is used for converting hard-work into automatic work. This machine will do all possible work automatically. Time to time update is provided by us, because some parts of the machine are needed maintenance and replacement. This idea of this machine is developed from the home industry. The machine is operated by the engineer. Every small detail of machine is provided in description below.

### **3. ProductDescription:-**

The entire project consists of following modules:-

- User module (Investor/owner)
- Production module (machine)
- Marketing module
- Distributing module

First we want to make our new automatic machine, therefore we require someone who have interest and want to invest his money on our machine making. Production of that automatic machine is laid down by professional engineer. checking of the working

machine is taken by machine makers. After checking we need to sell our machine to the market and the investor will provide marketing team. And in the end the machine is distributed to the buyer.

## **CHAPTER 2: DESIGN THINKING PHASE**

### **2.1 AEIOU Framework:**

#### **ACTIVITY:**

Using (automatic machine), it will be easy to work automatically in industry. In

the Activity section of this Framework we have included:

- Information
- Observation
- Discussion
- Management
- And Study Of Automatic Biscuit Making Machine.

#### **ENVIRONMENT:-**

In This Particular Component we will talk about our project related environment.

The Tool can be used in:-

- Cleanliness
- Free-wifi
- Noisy
- Violence
- Hotblooded atmosphere
- Smokey clouds

## **INTERACTIONS:-**

This Section used to give knowledge about some connection in design or anything:

- C.E.OTOM.D
- M.DTO H.R
- HRTOWORKER
- WORKERTO PEON
- HRTOVISITOR

## **OBJECTS:**

This Section Will include information about main objects in our project:

- MACHINES
- COMTPUTER
- FIRE-EXTIGUISHER
- SAFTYEQUIPMENTS
- ROUTERS

## **USERS:**

This Section Will Include The Actual or Realtime Users of this tool:

Users are those persons who are going to use our AUTOMATIC MACHINE.

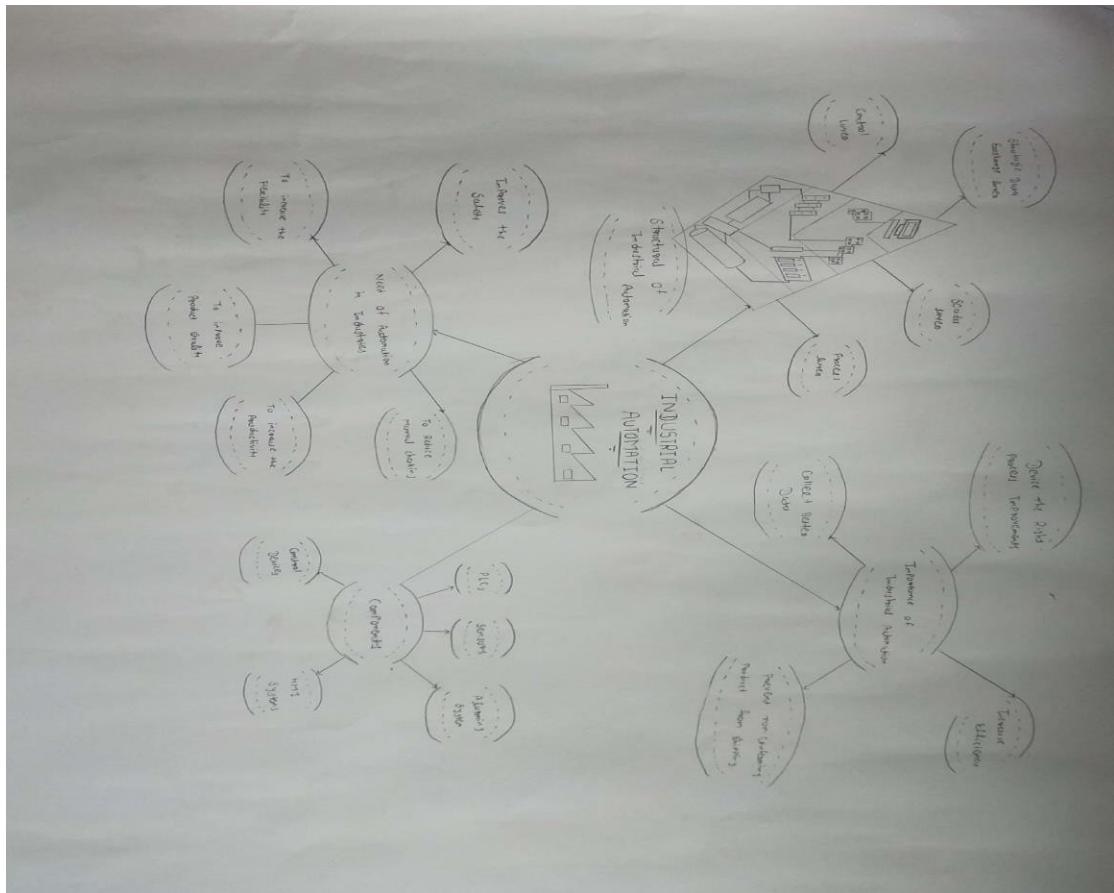
- INVESTOR
- WORKERS
- VISITOR
- ENGINEER

FIGURE1:AEIOUCANVAS:

AEIOU Summary:		Group ID: Domain Name:	Industry	Date:	Version:
<b>Environment:</b>  Noisy Violence Free-wifi cleanliness Hot blooded Atmosphere		<b>Interactions:</b>  CEO to MD MD to HR HR to worker Worker to person HR to Visitor		<b>Objects:</b>  Machines Computer Fire Extinguisher Safety Equipments Routers	
<b>Activities:</b>  Checking Maintenance Colouring Packaging Distributing		<b>Users:</b>  Investor Workers visitor Engineers Accounter			

## 2.2 MINDMAPPING:-

FIGURE2:MINDMAPPING CANVAS:



Mindmap describes the basic functioning of Our Tool.

It shows the whole automation process, it provides information about need and the last on importance of the industrial automation.

## **2.3 EMPATHY CANVAS:-**

### **USERS:**

The users of this Tool are those who are interacting with the other person through the software.  
Following are users:

- Investor
- Workers
- Visitor
- Engineer

### **STACKHOLDERS:-**

Stackholders are those who use and inspect the system.

m. These are:

- Investor
- Businessman
- Authorised dealer

### **ACTIVITIES:-**

Using the automatic machine in industry some activities are done as shown as

follows The Activities are:

- Checking
- Maintaining
- Packaging
- Distributing

- Meeting

## **STORY BOARDING:-**

### **HAPPY STORIES**

Story boarding is an activity where we try to show the emotions related with the activities and users.

It tells where the Tool was useful in any situation or harmful by not using it.

### **SAD STORIES**

Story boarding is an activity where we try to show the emotions related with the activities and users.

It tells where the Tool was useful in any situation or harmful by not using it.

Figure3:EMPATHYCANVAS:

Design For	Design By				
Date	Version				
<table border="1"> <thead> <tr> <th>USER</th> <th>STAKEHOLDERS</th> </tr> </thead> <tbody> <tr> <td>I nvestor Worker Owner</td> <td>Visioner Investor Distributor Organisational decider</td> </tr> </tbody> </table>	USER	STAKEHOLDERS	I nvestor Worker Owner	Visioner Investor Distributor Organisational decider	
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<table border="1"> <thead> <tr> <th>ACTIVITIES</th> </tr> </thead> <tbody> <tr> <td>Checking Manufacturing Marketing Participating</td> </tr> </tbody> </table>	ACTIVITIES	Checking Manufacturing Marketing Participating			
ACTIVITIES					
Checking Manufacturing Marketing Participating					
<p><b>STORY BOARDING</b></p> <p><b>HAPPY</b></p> <p>Once upon a time we require more workers or more man power to do our work because of this device requirement of workers man power became less.</p> <p><b>HAPPY</b></p> <p>When I meet one of our customer he was happy with this machine because it's provide more production in less time and it's save his time.</p> <p><b>SAD</b></p> <p>On one day, one of the owner, who was not proper operator but in the absent of the main operator he operated automatic machine without proper knowledge. Thus it's creates some machine problems.</p> <p><b>SAD</b></p> <p>One there is mechanical issue in that automatic machine due to this issue we face some production problem, this problem create some economical issues.</p>					

## **2.4 IDEATIONCANVAS:-**

### **PEOPLE:-**

The users of the Tool are those who are interacting with the other persons through the automatic machine.

Following are users:

- Investor
- Worker
- Engineer
- Visitor

### **ACTIVITIES:-**

Using the automatic machine, work in industry is done automatically. Activities are;

- Distribution
- Marketing
- Investment
- Donation

### **CONTEXT/LOCATION/SITUATION:-**

The location where the tool works are:

G.I.D.C, INDUSTRIAL PARKS

The context for  
automatic system are shown below. Production  
Marketing  
Investment

The situation where this system helps OR when we provided this system.

On demand

Instant available

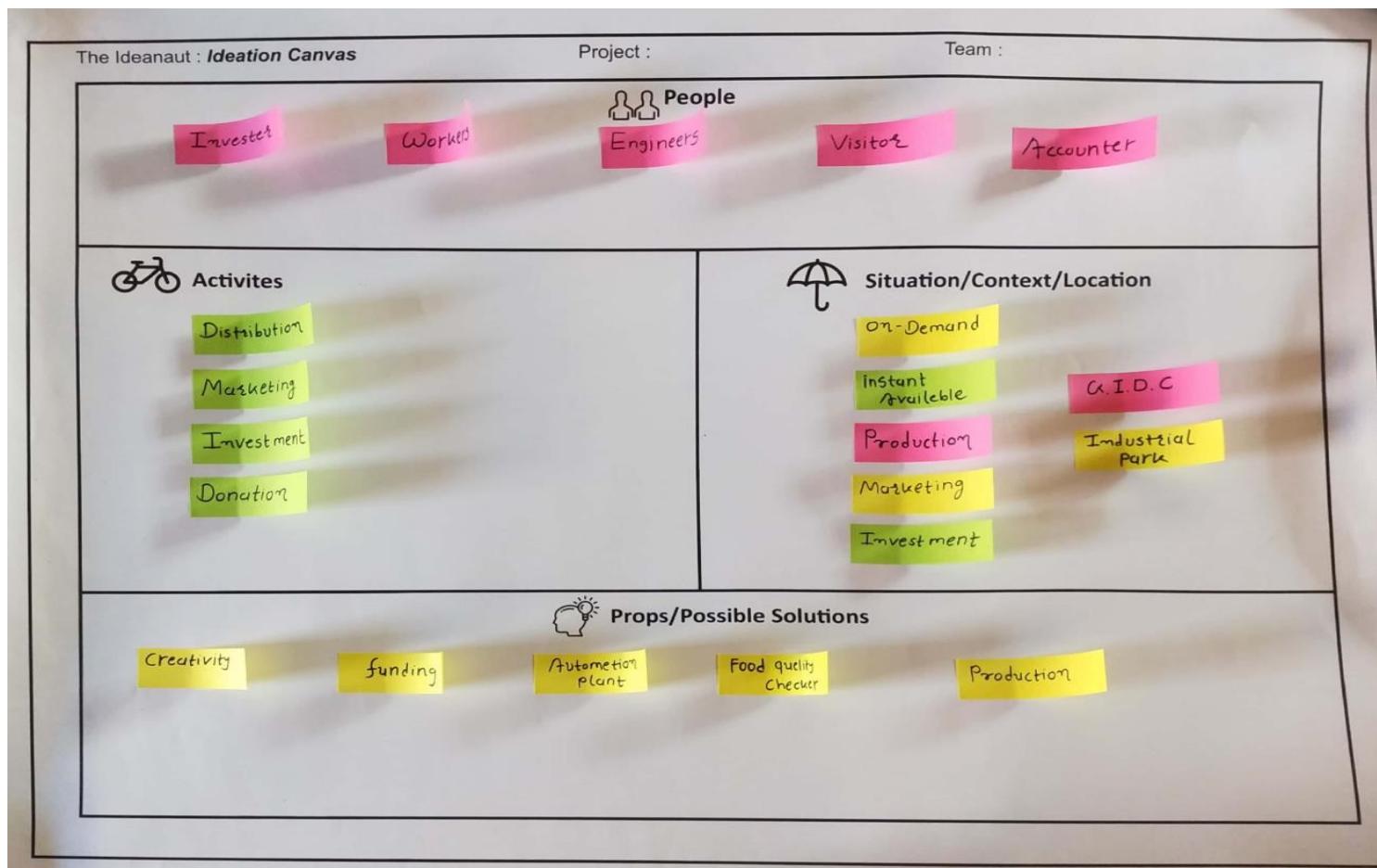
## PROPS/POSSIBLESOLUTIONS:

This section of ideation canvas help in carving out different requirement in line with attempting/ looking forward to have an idea about addressing a problem.

Props/possible solutions are:

- Creativity
- Funding
- Automation plant
- Food quality checker
- Production

Figure 4: IDEATION CANVAS:



## **2.4 PRODUCT DEVELOPMENT CANVAS:-**

### **PURPOSE:-**

In the last sheet we will be precise about the purpose of our topic (Industry automation) Our main aim is to minimize the requirement of workers and do work as soon as possible. Machine provide efficient work is less time.

### **PEOPLE:-**

The users of the automatic machine are those who work on the machine or who depend on the work done by the automatic machine.

Following are users:

- Investor
- Worker
- Engineer
- Visitor
- Accountant

### **PRODUCT FUNCTION:-**

As we are working for automation all possible work is done automatically

- Safe automation
- Multitasking

### **PRODUCT COMPONENTS**

This Section Includes The things That Are Required to Make The Automatic machine.

- Conveyor
- Emergency stop
- Start button
- Delta series PLCs
- Lm35

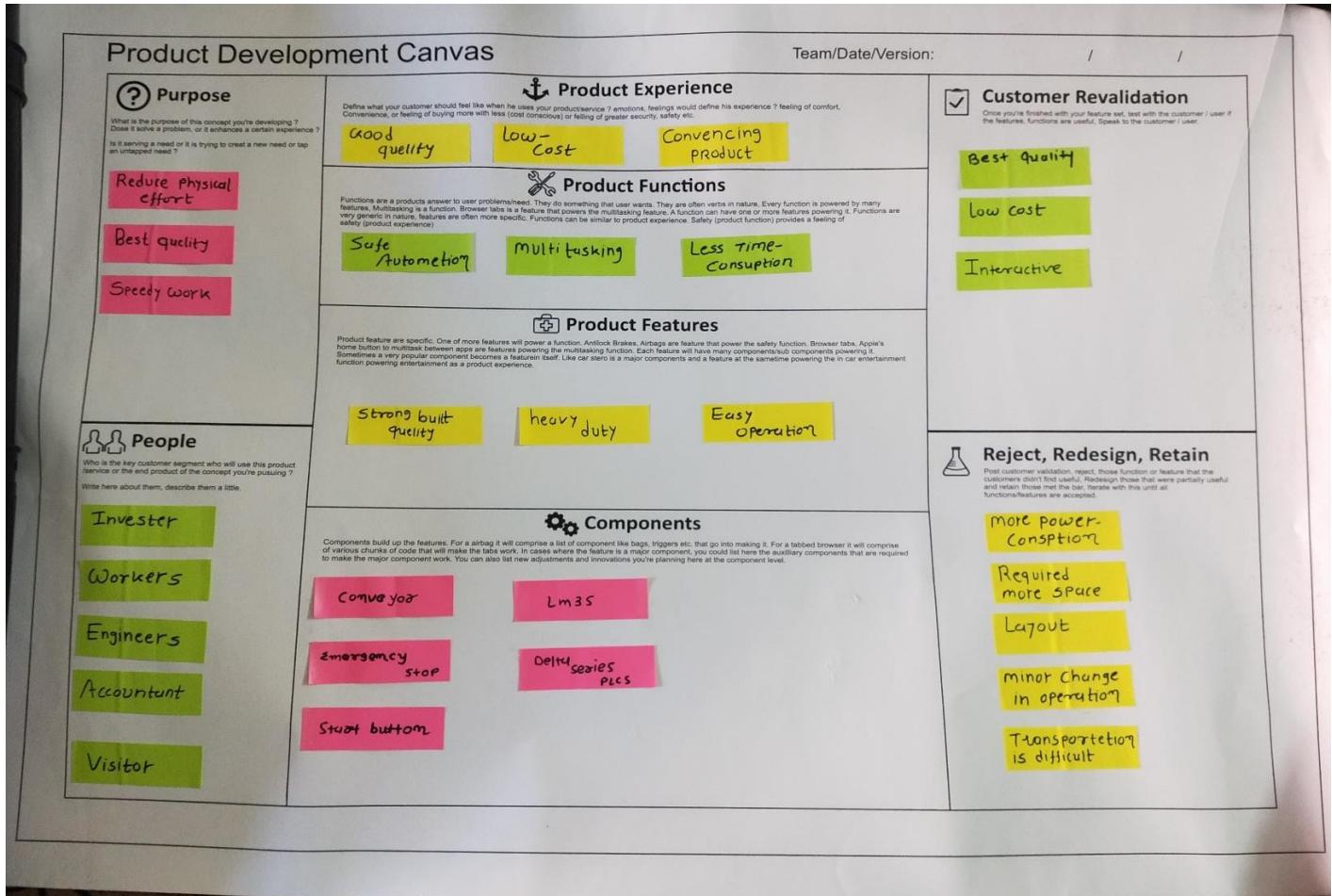
## **PRODUCTEXPERIENCE:**

- Good quality
- Lowcost
- Coefficientproduct

## **PRODUCTFEATURES:**

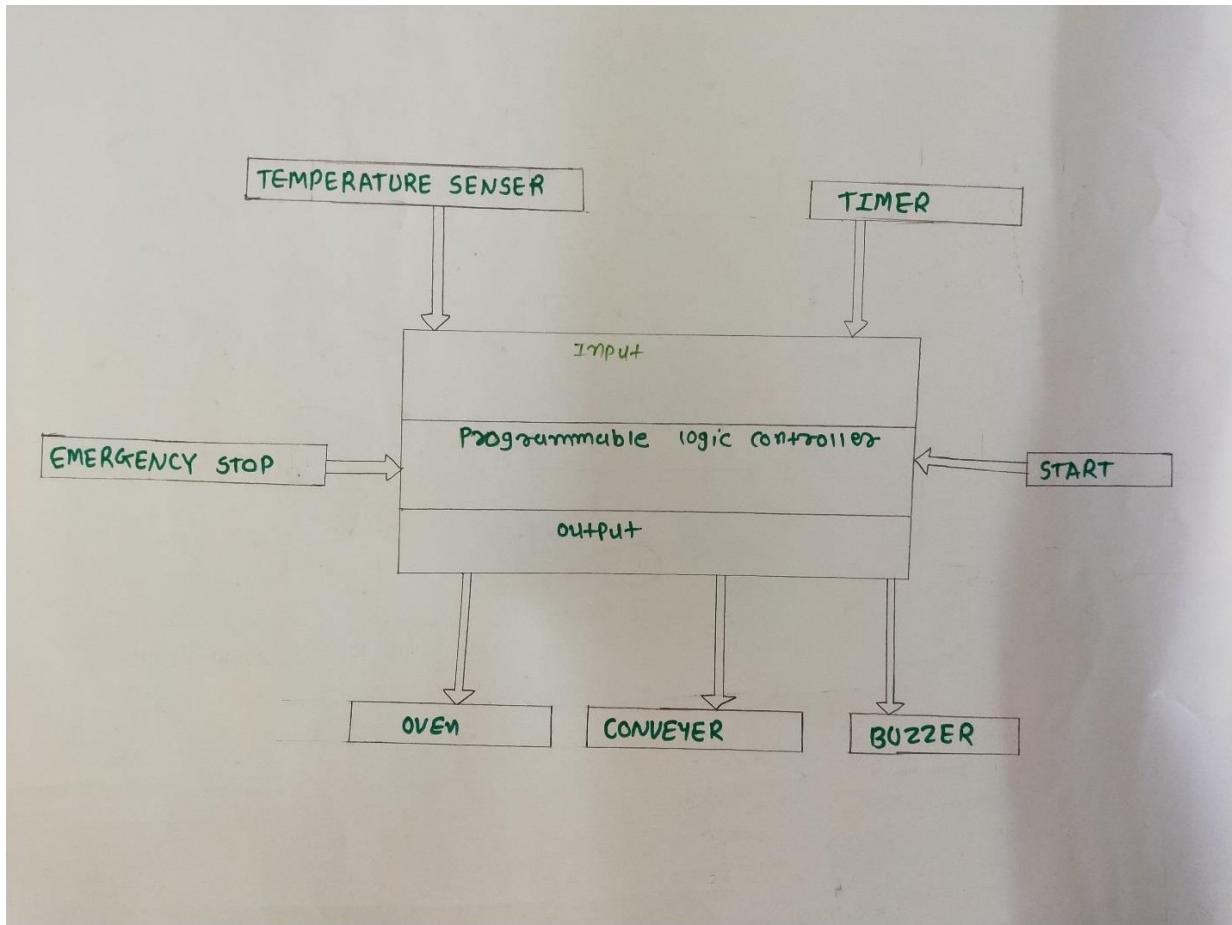
- Strongbuiltquality
- Heavyduty
- Easyoperation

Figure6:ProductDevelopment Canvas:



## 2.5 PROTOTYPE:

Figure6:Prototype:



## **CONCLUSION**

By studying this project along with the existing system, we can conclude that this project helps to improve the output accuracy with greater efficiency by reducing the man power. As the existing systems using microcontroller increases the complexity as well as the wiring required for the system is more also we can't rewrite the program in the microcontroller when it is already burned by the program. As we are using PLC which is reprogrammable with security and easy to use as compared to relay logic we can control multiple machines with multiple parameters with a single PLC.

## **REFERENCES**

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