

# *Chemical Safety Machine*

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# *Chemical Safety Machine*



## *Objective:*

- Idea
- Introduction about project.
- Our project with public Safety
- Problems
- Mechanical Functionality
- Electronic Functionality
- Software Functionality
- Demo

Safe is very important thing  
Safety is a pressing social need



# Idea



- **The basic idea of our project is public safety in chemical laboratories.**
- **Safety is first.**

## Idea (cont...)



- Chemical experiments may be **cause some dangerous.**
- Some of the possible outcomes of those interactions that cause **burns on the skin** or possible cause **suffocation** because of possible gas.

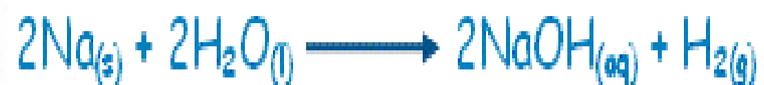
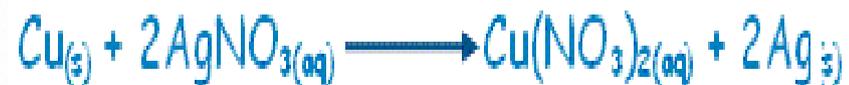


## **Idea (cont...)**

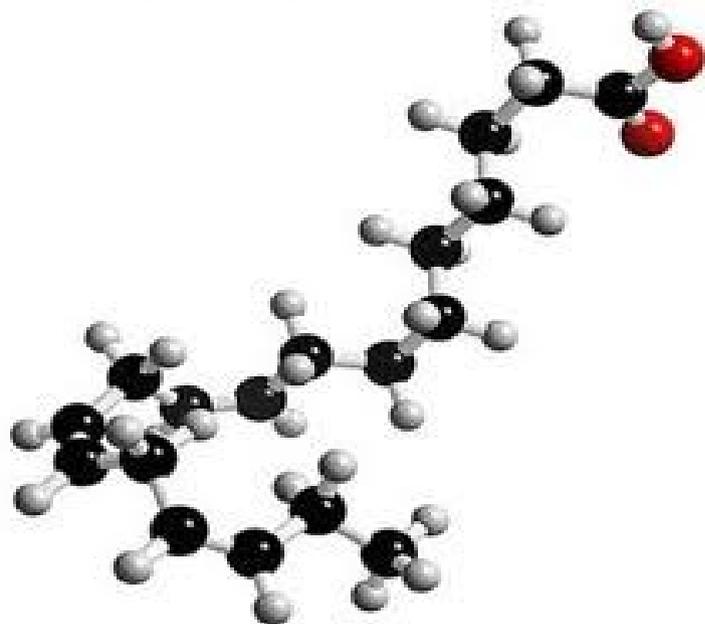


- In our project we isolate those hazardous chemicals on humans.
- The machine controls the mixing elements and chemical solutions with each other.
- So it is these interactions may be in a more safe and away from danger.
- This is keep you away to dealing directly with the products of these hazardous reactions, because all of things are done on away.

## Idea(cont..)



**Chemical Safety Machine (CSM)** apply chemical experiments by getting the chemical equation from chemists. that connect with server about network or Internet.



# First Steps



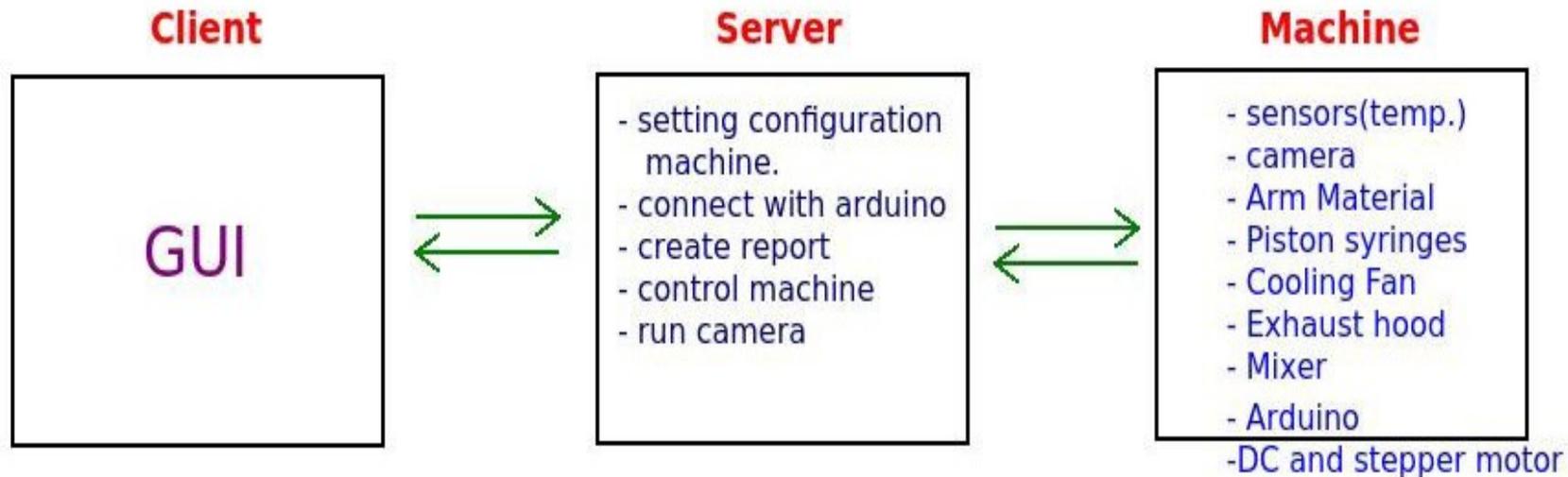
- We build our Machine from the **scratch**.
- We designed the outer Skeleton in mechanical engineering labs, we spent more than month to build this design
- We had faced some problems in the design, especially mechanical problems but we managed to overcome some of them, but not perfect accuracy.

## First Steps (cont....)



- Then the next step is put the rest of the elements on the Skelton such that (DC motor, Stepper Motor, some electronic circuit....etc).
- This design is built to isolate the tube in which you interact safely and away from danger is equipped with a cooling fan and a suction fan, and mixer

## First Steps (cont....)



**The system represent from software and hardware interact together.**

# Mechanical And Electronic Functionalities

# Arduino

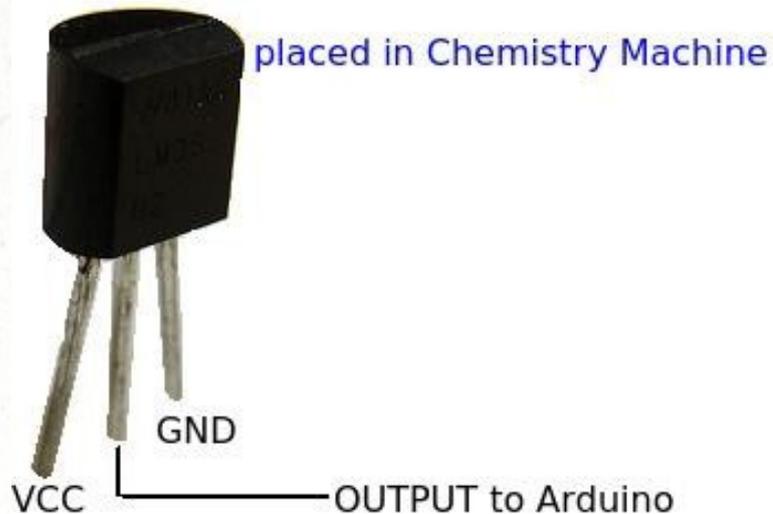
- Used to control all parts in the system .
- Receives commands from the application.



- Temperature sensor

-Used to measure the temperature of the experiment.

-When temperature greater than specified range cooler run



# Compressor Dc Motor

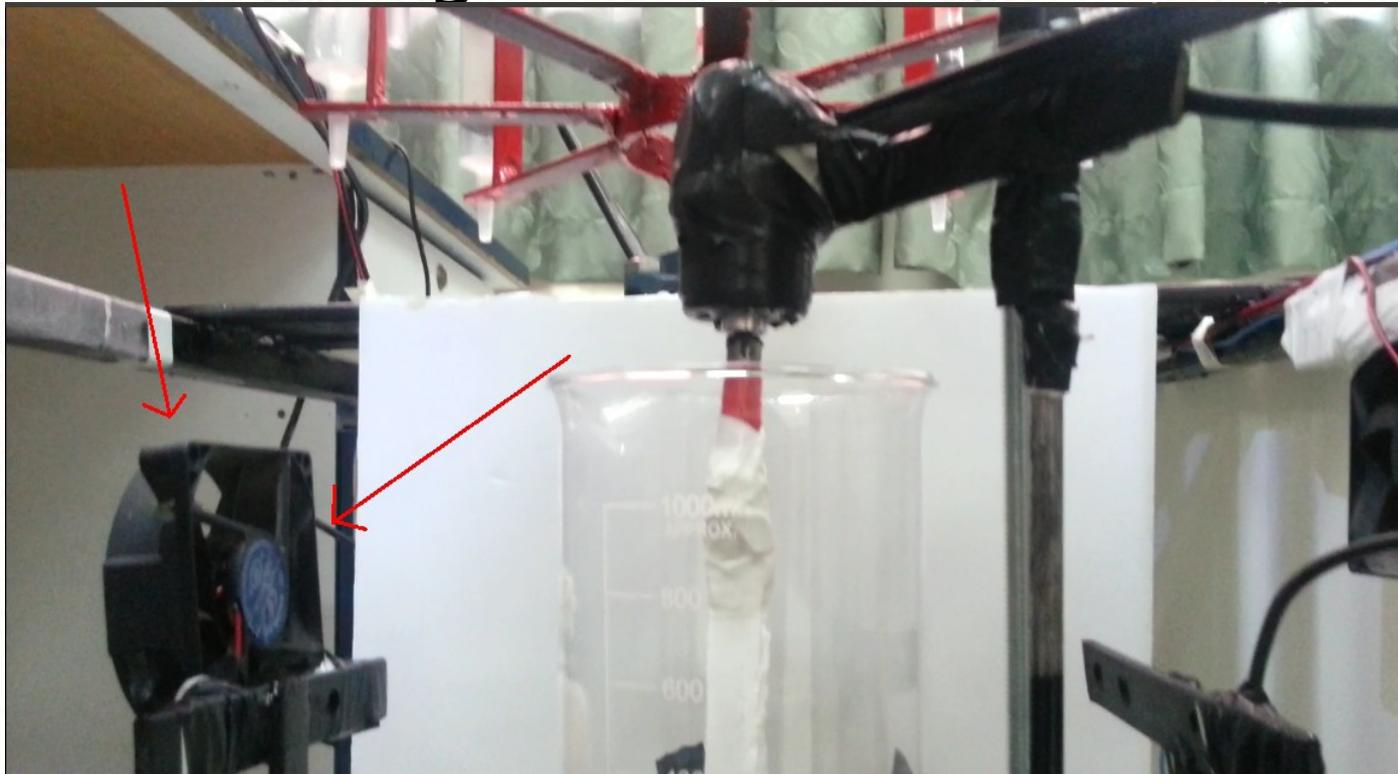
- Used to compress material syringes
- Move in two direction , down to compress the syringe and up to move back to the original position
- Specify the amount of material by moving time of th motor .

# Stepper Motor

- Used to move syringe bars to get to reaction materials .
- Divided to 8 parts (interval) ,each interval move bars to the following bar .

# Cooling fan

- Used to cool the experiment
- Automatically turned on when temperature high



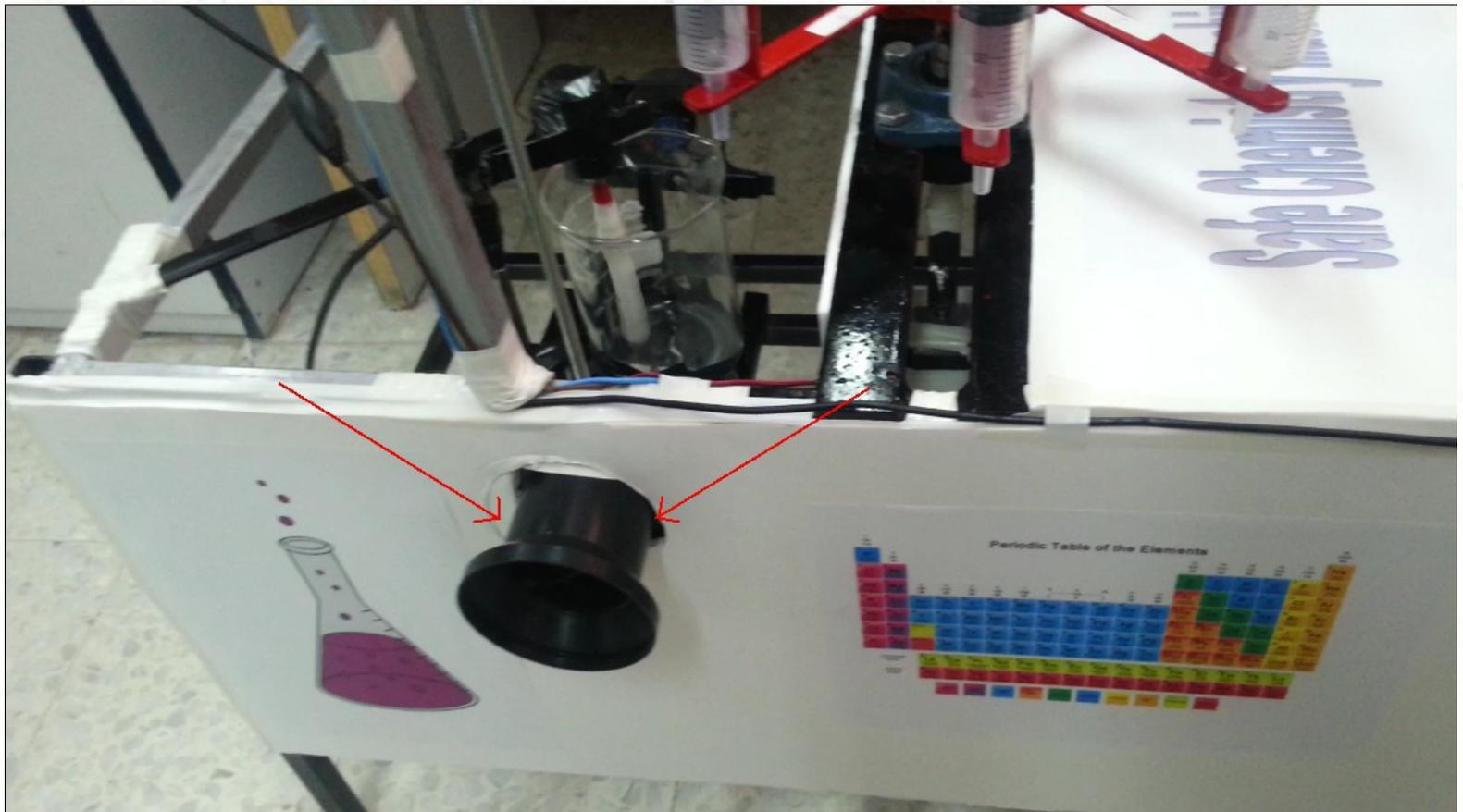
# Mixer

- Used to mix the materials in The reaction flask



# ***Hood Air***

- Used for Purification of the air in the system



# *Software*

- Arduino Programming: C Language
- Serial Control: Python

# *Software Functionality*

- Security.
- Network Camera for experiments monitoring.
- Configuration for Setting Machine and Message.
- Automatic Machine Control.
- Manual Machine Control.
- Sensors.
- Report.

# Security Software

Gate Permission Access

**Clasic ERP System**  
OPEN SOURCE MANAGEMENT SOLUTION

Server IP: 127.0.0.1

Server Port: 3333

Database Name: 

User Name: admin

User password: ....

Language: العربية

Login 

Database Management 

- Server and Client Data **Encryption**
- Login About Secure Network.
- **User name and password** to login.
- User levels

# Networking Camera

The screenshot displays a web-based application interface for a Networking Camera. At the top, there is a menu bar with 'File', 'Tools', 'View', and 'Help'. Below the menu bar is a toolbar containing various icons for file operations, navigation, and system functions. The interface is divided into several sections:

- Navigation Tabs:** 'CHEMICAL MACHINE', 'TOOLS', 'HUMAN RESOURCES', and 'ACCOUNTING'. The 'CHEMICAL MACHINE' tab is currently selected.
- Sidebar:** A vertical list of options including 'Camera', 'Sensors', 'Manual Control Machine', 'Automatic Control Machine', 'Configuration', and 'Report'. 'Camera' is the active selection.
- Form Area:** A central workspace titled 'Form' containing a 'Camera' section. It features a large, prominent button labeled 'Open Camera' with a green play icon. The text 'C-S-C' is visible in the background of the form area.
- Footer:** A copyright notice at the bottom center reads 'Copyright 2012 © C-S-C'. The word 'Company' is also visible in the background.

# Configuration Machine

File Tools View Help

Configuration Machine

CHEMICAL MACHINE TOOLS HUMAN RESOURCES ACCOUNTING MARKETING PROJECT ASSOCIATION TEST

Camera Configuration Machine Configuration Twitter Configuration Message

Sensors حفظ تعديل حذف بحث طباعة تقرير تحديث

Manual Control Machine Form List

Automatic Control Machine

Configuration

Report

## Configuration Machine

Arm Number: 1

Chemical Solvents: CO

Periodic Table:

Choice:  
 Chemical Solvents  
 Member

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# Configuration Machine

Classic ERP System (Enterprise Resource Planning)

File Tools View Help

CHEMICAL MACHINE TOOLS HUMAN RESOURCES ACCOUNTING MARKETING

Camera Sensors Manual Control Machine Automatic Control Machine Configuration Report

Configuration Machine Configuration Twitter Configuration Message

حفظ تعديل حذف بحث طباعة تقرير تحديث

Form List

Configuration Machine

Table Group

Edit	Arm Number	Choice	Periodic Table	Chemical Solvents
<input checked="" type="checkbox"/>	1	Chemical Solvents		CO
<input type="checkbox"/>	2	Chemical Solvents		H2O
<input type="checkbox"/>	4	Chemical Solvents		AGH
<input checked="" type="checkbox"/>	3	Member	Mg	CO
<input type="checkbox"/>	7	Member	Au	CO
<input type="checkbox"/>	5	Member	Cu	FFFF
<input type="checkbox"/>	6	Member	Lr	C2H5

# Configuration Message

File Tools View Help

Configuration Machine Configuration Twitter Configuration Message

حفظ تعديل حذف بحث طباعة تقرير تحديث

Form List

Configuration Message

**Configuration Message [Twitter-Facebook-Mobile]**

Consumer Key:

Consumer Secret:

Access Token Key:

Access Token Secret:

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# Automatic Machine Control

The screenshot displays a web-based interface for a Classic ERP System. The main window title is "Classic ERP System (Enterprise Resource Planning)". The menu bar includes "File", "Tools", "View", and "Help". A toolbar contains various icons for file operations, navigation, and system control. The interface is divided into several sections:

- Navigation Tabs:** CHEMICAL MACHINE, TOOLS, HUMAN RESOURCES, ACCOUNTING, MARKETING, PROJECT.
- Sub-Tabs:** Full Auto Run, Auto File Control, Automatic Control.
- Action Buttons:** حفظ (Save), تعديل (Edit), حذف (Delete), بحث (Search), طباعة تقرير (Print Report), تحديث (Update).
- Form Controls:** Form, List, Graph.
- Main Content Area:**
  - Section: Full Auto Run
  - Text: Advanced Performance For The Experience
  - Text: C-S-C
  - Chemical Equation:  $30(\text{Au})+30(\text{AGH})+20(\text{Mg})\rightarrow(\text{MIX-COLD-FAN})$
  - Start button

# History for Equation

Classic ERP System (Enterprise Resource Planning)

File Tools View Help

CHEMICAL MACHINE TOOLS HUMAN RESOURCES ACCOUNTING MARKETING PROJECT

Camera Sensors Manual Control Machine Automatic Control Machine Configuration Report

Full Auto Run Auto File Control Automatic Control

حفظ تعديل حذف بحث طباعة تقرير تحديث

Form List Graph

Full Auto Run

Table Group

Edit	Chemical Equation
<input type="checkbox"/>	$10(\text{H}_2\text{O})+3(\text{H})\rightarrow(\text{MIX-COLD-FAN})$
<input type="checkbox"/>	
<input type="checkbox"/>	$10(\text{H}_2\text{O})+3(\text{CO})\rightarrow(\text{MIX-COLD-FAN})$
<input type="checkbox"/>	$10(\text{H}_2\text{O})+3(\text{CO})\rightarrow(\text{MIX-FAN-COLD})$
<input type="checkbox"/>	$30(\text{Au})+30(\text{AGH})+20(\text{Mg})\rightarrow(\text{MIX-COLD})$
<input type="checkbox"/>	$30(\text{Au})+30(\text{AGH})+20(\text{Mg})\rightarrow(\text{MIX-COLD-FAN})$

# Manual Control Machine

File Tools View Help

Control Machine Tools

Camera  
Sensors  
Manual Control Machine  
Automatic Control Machine  
Configuration  
Report

TOOLS HUMAN RESOURCES ACCOUNTING MARKETING PROJECT ASSOCIATION TEST

حفظ تعديل حذف بحث طباعة تقرير تحديث

Form List Graph

Control Machine Tools

Step Number: 1 Rotate

Amount Material: 2 mm Press Down Move UP STOP

File Tools View Help

CHEMICAL MACHINE TOOLS HUMAN RESOURCES ACCOUNTING

Camera Read Sensors

Sensors

Manual Control Machine

Automatic Control Machine

Configuration

Report

حفظ تعديل حذف بحث طباعة تقرير تحديث

Form List Graph

Read Sensors

Sensors Data Reader

C-S-C

Choice Rensors:

- Tempreture
- CO2
- H2O
- N
- H
- Light

Read Sensors

Company

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*Sensors*

*Future Work*

Classic ERP System (Enterprise Resource Planning)

File Tools View Help

CHEMICAL MACHINE TOOLS HUMAN RESOURCES ACCO

Camera  
Sensors  
Manual Control Machine  
Automatic Control Machine  
Configuration  
Report

Download Report Upload Report

حفظ تعديل حذف بحث طباعة تقرير تحديث

Form List Graph

Download Report

Print Report

File selection

/home/omar/Desktop/Browser

Folders	Files
./	run
../	uds_socket
debug/	
documents/	

Home Desktop Documents

New Folder Rename File Delete File

Selection: /home/omar/Desktop/Browser

result.pdf

Cancel OK

*Report*

*Demo*

*Thank You*