

Context Information v2.0

These are the Context Information that I have thought of:

1. **Type of Order (XML Files)**

a. An **Open Order** Message

i. **Individual Order**

If the amount to be produced is small, it's advisable to deploy more manual workforce which will be economic for the company rather than deploying high-end machines with lots of surveillance and maintenance measures. Typically if the Number of Units Ordered ≤ 1000 .

ii. **Large Scale Order**

If the amount to be produced is large and the delivery period is less, it's advisable to deploy both machines and manual workforce which will be efficient to keep the business running. Certain thresholds need to be planned:

1. $1000 < \text{Number of Units Ordered} \leq 3000$: Both Manual and Machines works preferred.
2. $\text{Number of Units Ordered} > 3000$: Mass Production needs preferably only Machine works.

b. A **Cancel Order** Message

i. **Fully Cancel**

If the customer cancels the order completely and don't want to receive already produced products, calculate the compensations and pile up the items in Inventory for others.

ii. **Partially Cancel**

If the customer is ready to accept already produced units, perform the set of ad-hoc tasks.

2. **Order Forecasts (MySQL Forecast Database)**

It's done by the Marketing and Business Analysts of the company for a specific period e.g. FY, Month etc.

a. **Low Forecast**

It need not put more stress upon supply-chain to procure raw materials as it can meet demands.

b. **High Forecast**

It need to optimize the supply-chain to procure raw materials well before receipt of order to for a faster throughput and delivery of goods.

3. **Inventory Status (RFID Tag + RFID Sensor Network + MySQL Sensor Database)**

Keep track of the count of Tags in the vicinity of warehouse using a Wireless network. Each item may have a RFID Tag attached. The end users can find out the exact location of the item and tally the number of items in the same category.

a. **Sufficient**

If number of units order is 50% of the number of units piled up in inventory, dispatch directly.

b. **Not Sufficient**

If number of units order is more than the 50% threshold, required amount need to be produced.

4. **Warehouse Status (RFID Tag + RFID Sensor Network + MySQL Sensor Database)**

Keep track of the count of Tags in the vicinity of warehouse and also logistics using a Wireless network. Each item may have a RFID Module attached.

a. **Sufficient**

If required amount of raw materials are ready for the production process.

b. **Not Sufficient**

If required amount of raw materials is critically low for the production to start.

5. **Employee Availability (GPS Enabled Devices + MySQL Sensor Database)**

Using the GPS locations of the employees and logistics around the production location, people of certain profile can be allotted to a specific task to perform.

For simplicity we will use **3 profiles**: Quality Inspectors (Testers), Machine Operators and Manual Workers.

a. **Not Available**

Processes have to wait for 15 minutes if no one is available in the premises and again search if someone is nearby to look after the machine.

b. **Available** means follow the workflow smoothly.

6. Other Sensor Messages (**Wireless Sensor and Actuator Network** + **MySQL Sensor Database**)

Following types of messages (Statuses) can be sent from one sensor assuming Sensors don't really fail.

- a. **Started** (OK)
- b. **Ended** (OK)
- c. **Halted** (Not OK → Repair)
- d. **Stopped** (Not OK → Repair)
- e. **Malfunctioned** (Not OK → Maintenance)

Following types of Sensors can be used to monitor the real-time details of the machines whether they are properly working or not:

- I. **Lining Machine** will be tracked by Ultrasonic Thickness Gauge, Flame Detector, Pressure Sensor
- II. **Welding Machine** will be tracked by Ultrasonic Thickness Gauge, Flame Detector
- III. **Skinner** will be tracked by Heat Sensor, Voltage Sensor
- IV. **Connecting Machine** will be tracked by Heat Sensor, Voltage Sensor
- V. **Squirting and Molding Machine** will be tracked by Heat Sensor, Laser Sensor
- VI. **Test Bed** will be tracked by Current Sensor, Voltage Sensor
- VII. **Sewing Machine (Interlocking and Bordering)** will be tracked by Pressure Sensors, Voltage Sensor
- VIII. **Packet Sealer** will be tracked by Infrared Sensor, Shock Detector

Each machine unit will have a RFID chip inside to keep track of its location in the premises of the company and to find the nearest worker to deploy at the location. Various Watchdogs in conjugation with the mentioned sensors will be coupled with the machines to form a Wired or Wireless network of their selves.

A following sample schema of database can be seen upon by the before mentioned details. It will be fully planned and designed during the realization of scenarios:

Sensor DB (Diff Tables for Diff Machines)					
<u>Sensor_Name</u>	<u>Machine_Name</u>	<u>Location</u>	<u>Owner</u>	<u>Status</u>	<u>Replaced_By</u>

Forecast DB				
Inventory_Table	<u>Inventory_Name</u>	<u>Total_Units</u>	<u>Ready-to-Go_Units</u>	<u>Bad_Units</u>
Warehouse_Table	<u>Materia_Name</u>	<u>Supplier_Name</u>	<u>Quantity</u>	<u>Date_of_Receipt</u>
Order_Table	<u>Customer_Name</u>	<u>Date_of_Order</u>	<u>Units_Ordered</u>	<u>Payment</u>
Forecast	<u>Forecaster_Name</u>	<u>Forecast_Type</u>	<u>Reasons</u>	<u>Date_of_Validity</u>