Aniruddha Kudalkar

aniruddha.kudalkar@gmail.com, +919607352625

Industry 4.0 implementation using Open Source projects

Aniruddha Kudalkar

aniruddha.kudalkar@gmail.com, +919607352625

Introduction

Founder, Industry 4.0 Consultant

Startup Founder with 9 years of experience in providing Software Services to manufacturing industries. Also 4 years back, I have started working on Smart Factory and Industry 4.0

Aniruddha

Aniruddha Kudalkar

aniruddha.kudalkar@gmail.com, +919607352625

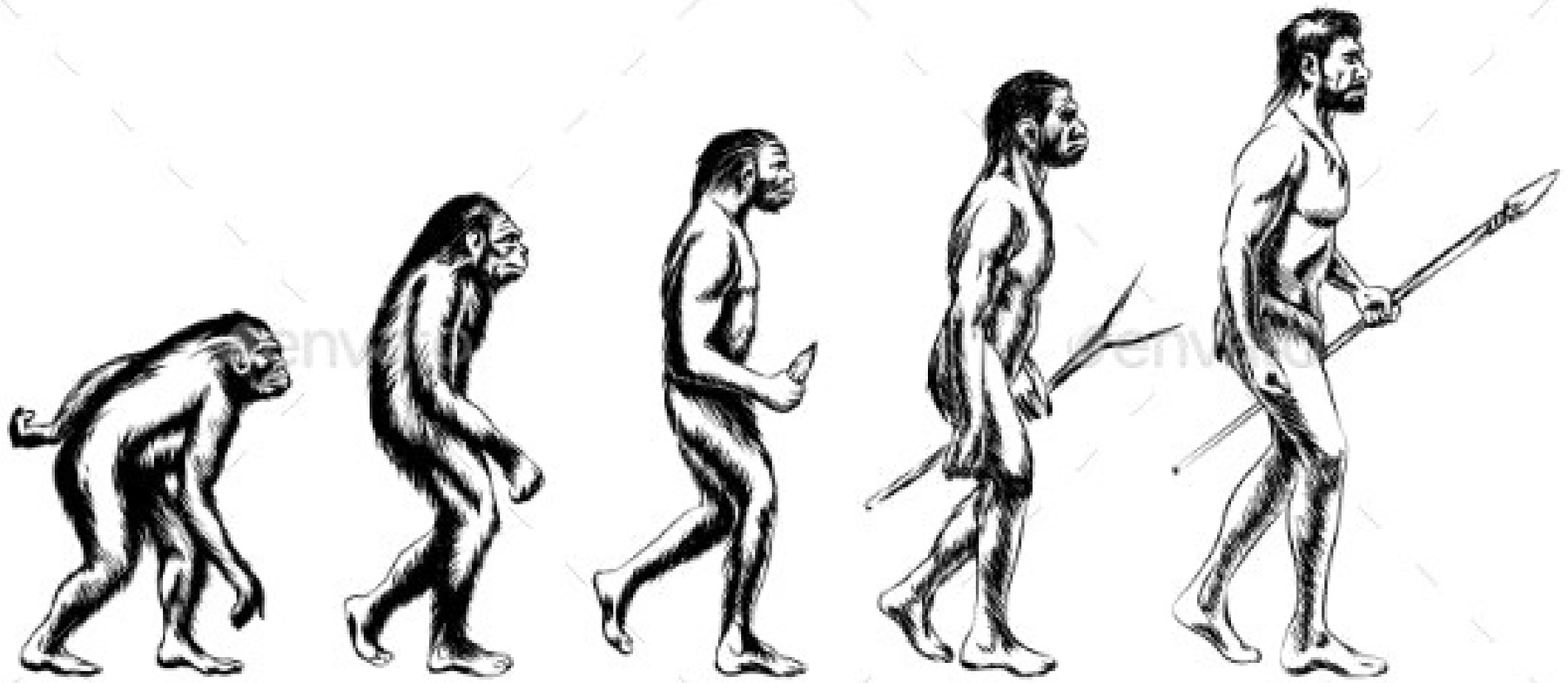
Know WHY

what is Industry 4.0 ?

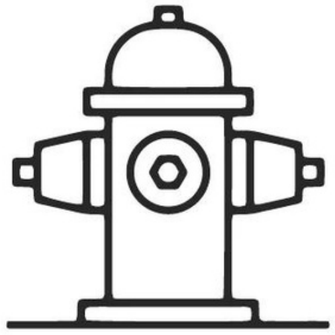
Aniruddha Kudalkar

aniruddha.kudalkar@gmail.com, +919607352625

automation of traditional manufacturing and industrial practices, using modern technologies like M2M and IoT

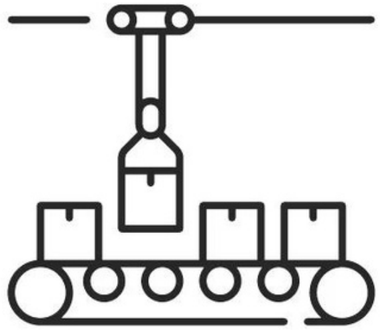


human evolution



1st

Mechanization, water power, steam power

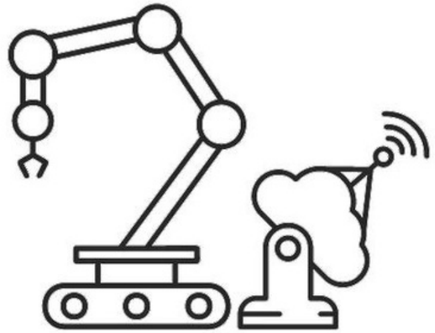


2nd

Mass production, assembly line, electricity

3rd

Computer and automation



4th

Cyber Physical Systems

Aniruddha Kudalkar

aniruddha.kudalkar@gmail.com, +919607352625

1st revolution

transition from hand production methods to machines through the use of steam and water power; 1760 and 1820, or 1840

Aniruddha Kudalkar

aniruddha.kudalkar@gmail.com, +919607352625

2nd revolution

technological revolution; installations of extensive railroad and telegraph networks. Use of electricity for deploying production lines. 1871 and 1914

Aniruddha Kudalkar aniruddha.kudalkar@gmail.com, +919607352625

digital revolution, with extensive use of computer and communication technologies in the production process; late 20th century.

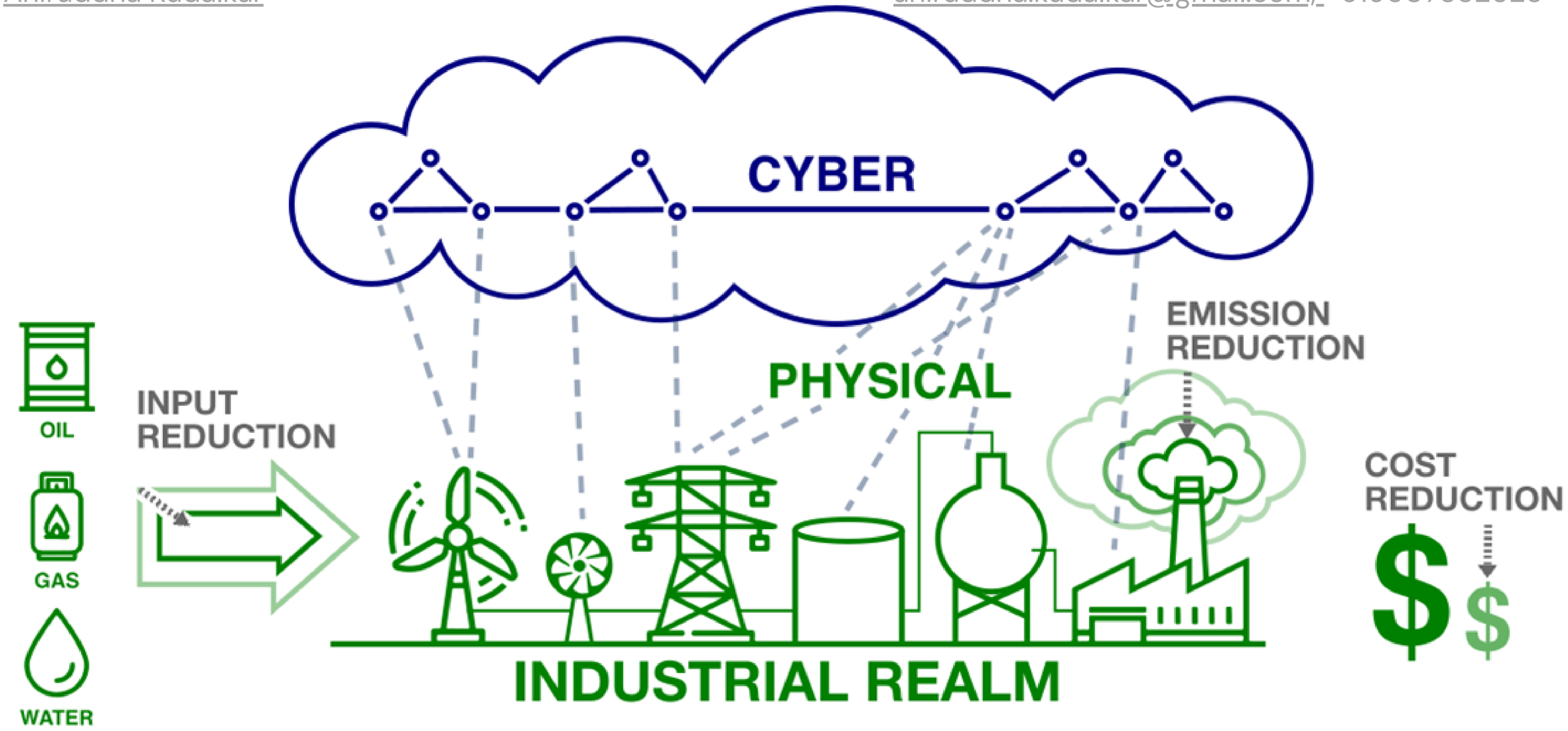
3rd revolution

Aniruddha Kudalkar aniruddha.kudalkar@gmail.com, +919607352625

cyber physical systems; integrations of computation, networking, and physical processes; computers and networks monitor and control the physical processes; 2011

4th revolution

Aniruddha Kudalkar aniruddha.kudalkar@gmail.com, +919607352625



Aniruddha Kudalkar

aniruddha.kudalkar@gmail.com, +919607352625

4th revolution

is all about
DATA

Aniruddha Kudalkar

aniruddha.kudalkar@gmail.com, +919607352625

Why Industry 4.0 ?

1. Interconnection
2. Information Transparency
3. Technical Assistance
4. Decentralised Decisions

Aniruddha Kudalkar

aniruddha.kudalkar@gmail.com, +919607352625

Know HOW

what is Open Source ?

Aniruddha Kudalkar

aniruddha.kudalkar@gmail.com, +919607352625

source code that is made freely available for possible modification and redistribution

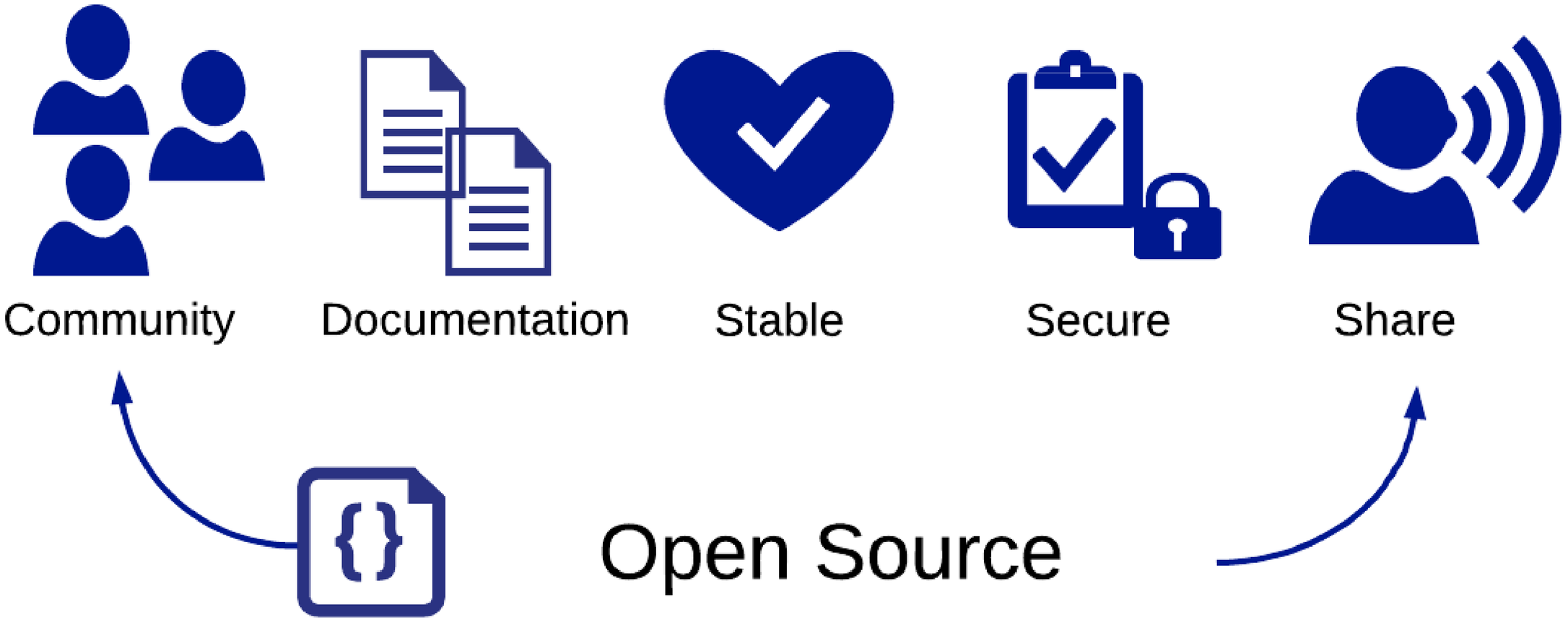
Aniruddha Kudalkar

aniruddha.kudalkar@gmail.com, +919607352625

open source technology and thinking benefit both programmers and corporate

Aniruddha Kudalkar

aniruddha.kudalkar@gmail.com, +919607352625



Aniruddha Kudalkar

aniruddha.kudalkar@gmail.com, +919607352625

Why Open Source ?

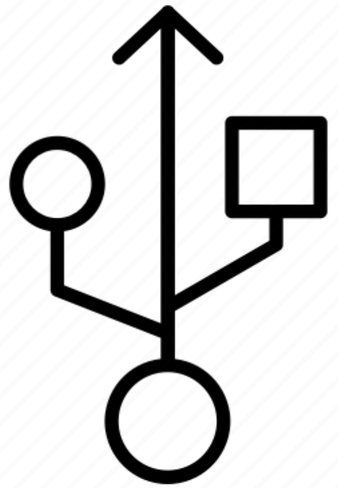
1. Control
2. Training
3. Security
4. Stability
5. Share

Aniruddha Kudalkar

aniruddha.kudalkar@gmail.com, +919607352625

know WHAT

Project Implementation



Aniruddha Kudalkar

aniruddha.kudalkar@gmail.com, +919607352625

IIoT Ecosystem

IIoT Platform

Edge Gateway

OPC-UA

Low Code Engine

Aniruddha Kudalkar

aniruddha.kudalkar@gmail.com, +919607352625

use of these frameworks can build complete IIoT ecosystem

Aniruddha Kudalkar

aniruddha.kudalkar@gmail.com, +919607352625

Eclipse Kapua

Modular IoT cloud platform to manage and integrate devices and their data. A solid integrated foundation of IoT services for any IoT application.

1. platform for IoT devices and smart sensors.
2. Management of edge IoT nodes .
3. Data Aggregation for analysis purpose
4. Web Console for management
5. REST Api are available

Aniruddha Kudalkar

aniruddha.kudalkar@gmail.com, +919607352625

Eclipse Kura

1. I/O Services
2. Data Services
3. Cloud Services
4. Configuration & Remote Management
5. Networking and Watchdog
6. Web administration interface

IOT Gateway provides or, when available, aggregates open source implementations for the most common services needed by M2M applications.

Aniruddha Kudalkar

aniruddha.kudalkar@gmail.com, +919607352625

Eclipse Millo

OPC Unified Architecture is an interoperability standard that enables the secure and reliable exchange of industrial automation data while remaining cross-platform and vendor neutral.

1. Supports (1.03) of the UA specifications.
2. compliant UA client and server applications.
3. interface between Clients and Servers
4. access to real-time data
5. monitoring of alarms and events
6. historical data access
7. data modelling

Aniruddha Kudalkar

aniruddha.kudalkar@gmail.com, +919607352625

1. Low-Code Engine
2. Browser-based flow editing
3. Built on Node.js
4. Social Development
5. Run Locally, On SBCs and Cloud

Node-RED

Node-RED is a programming tool for wiring together hardware devices, APIs and online services in new and interesting ways.

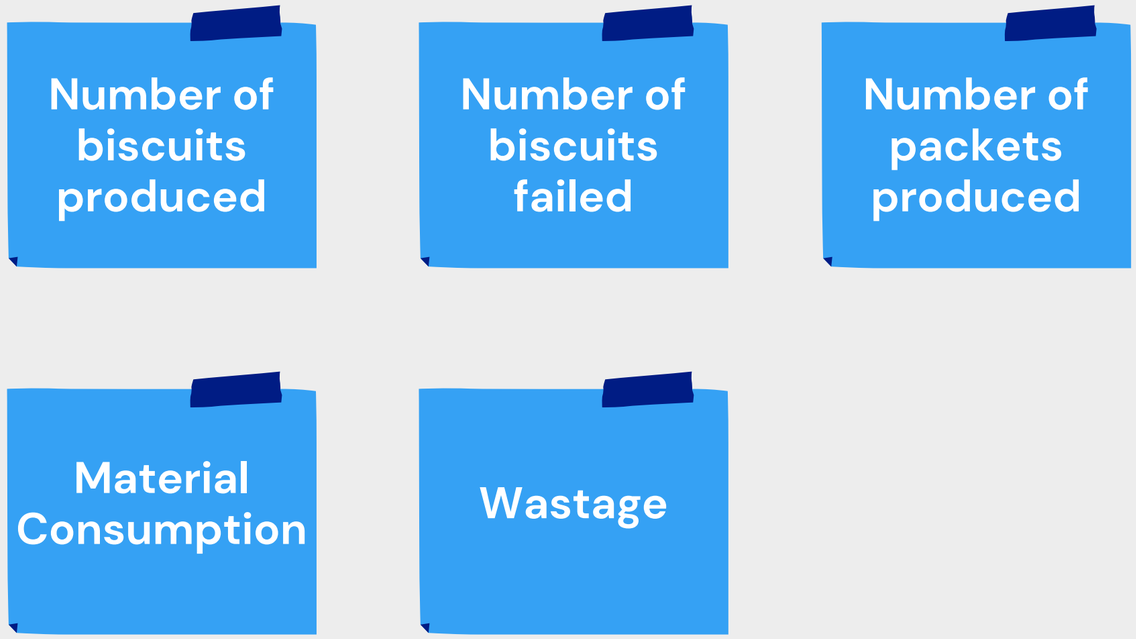
Aniruddha Kudalkar

aniruddha.kudalkar@gmail.com, +919607352625

it covers IIoT Platform, IoT Gateway, OPC-UA Implementation and Low-Code Engine

Case Study

Aniruddha Kudalkar
aniruddha.kudalkar@gmail.com, +919607352625



Biscuit Production company wants to track these details.
Every end of the day IIoT system should send qn email and telegram message about these 5 parameters.

Aniruddha Kudalkar

aniruddha.kudalkar@gmail.com, +919607352625

Thank you !
contact me for your questions and queries

Aniruddha Kudalkar

aniruddha.kudalkar@gmail.com

+91 9607352625

Aniruddha Kudalkar

aniruddha.kudalkar@gmail.com, +919607352625

credits for content

1. wikipedia
2. berkeley.edu
3. flaticon
4. canva
5. google