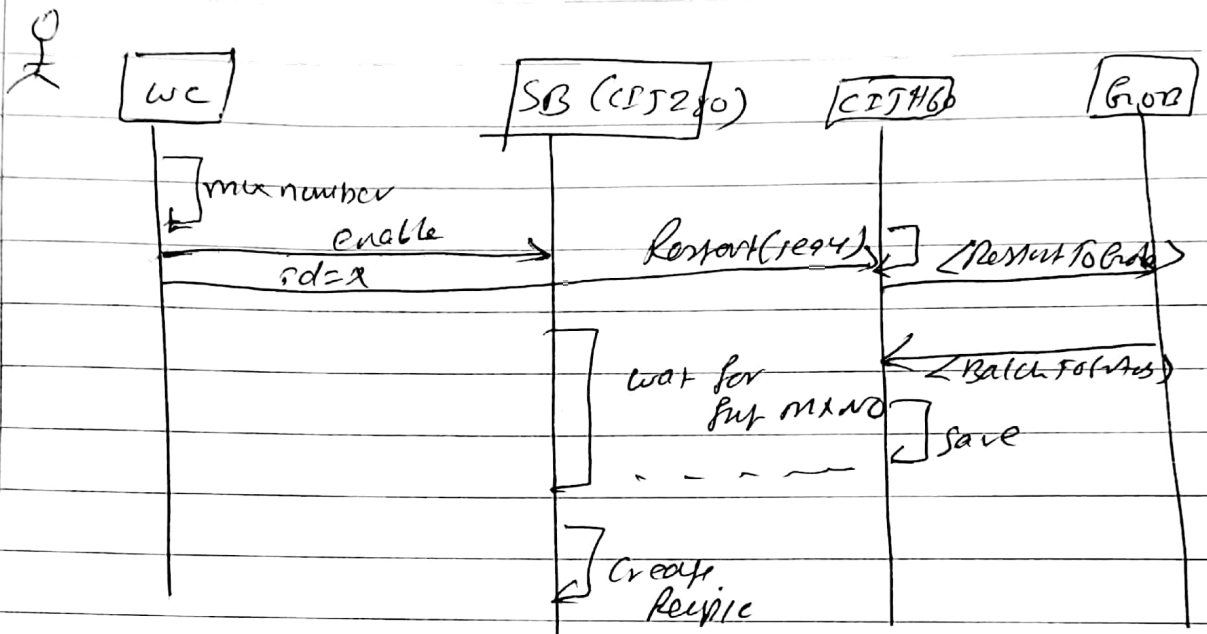CIR 375
CIR 364
CIR 366

CIR109: PIC (IQ, RegClock) + BPDIOPNR?

GOB → currently me have Message (XMC)
CIJ160 → thread will run and will read its message.
and save it is database.

get Side
good
gife   Vceney Ryaganti

TCID Replacement:

Background
TCID Functionality
Solution overview   AD lagager enterprise M608
Implementing TCID functions
Shedule overview   PN Number
Monitoring & support   PR 4 2 / 3 2
Application management   Volvo car Semdeva 46 31 59/000
                                          Vo soca

* TCID is a link between the shop floor in the c-shop.
* TCID was carried in 2002, but functionality is still (2015) being
  changed and added.

REM

RTM 04 2015

Project goals :-
            • Replace TCID to reduce the risks associated with
the current situation

            • Shive towards Common Vcc solutions.

        TCID is replaced by
            • new functionality in SAMS
            VO Communication
            The new Data PLC

One Data PLC for each assanbly line section, and one
Data PLC for all pre-assembly sections

Seperate Processes in VO and ~~SASA~~ ~~SAS~~ SAMS for each Data plc

1304:-

Problem Statement :-

TCID (Tracking Controlling and Identification) is used in the TC-Factory for Controlling the assembly line and is highly production critical. the System is dependent on a single key resource for maintance and support
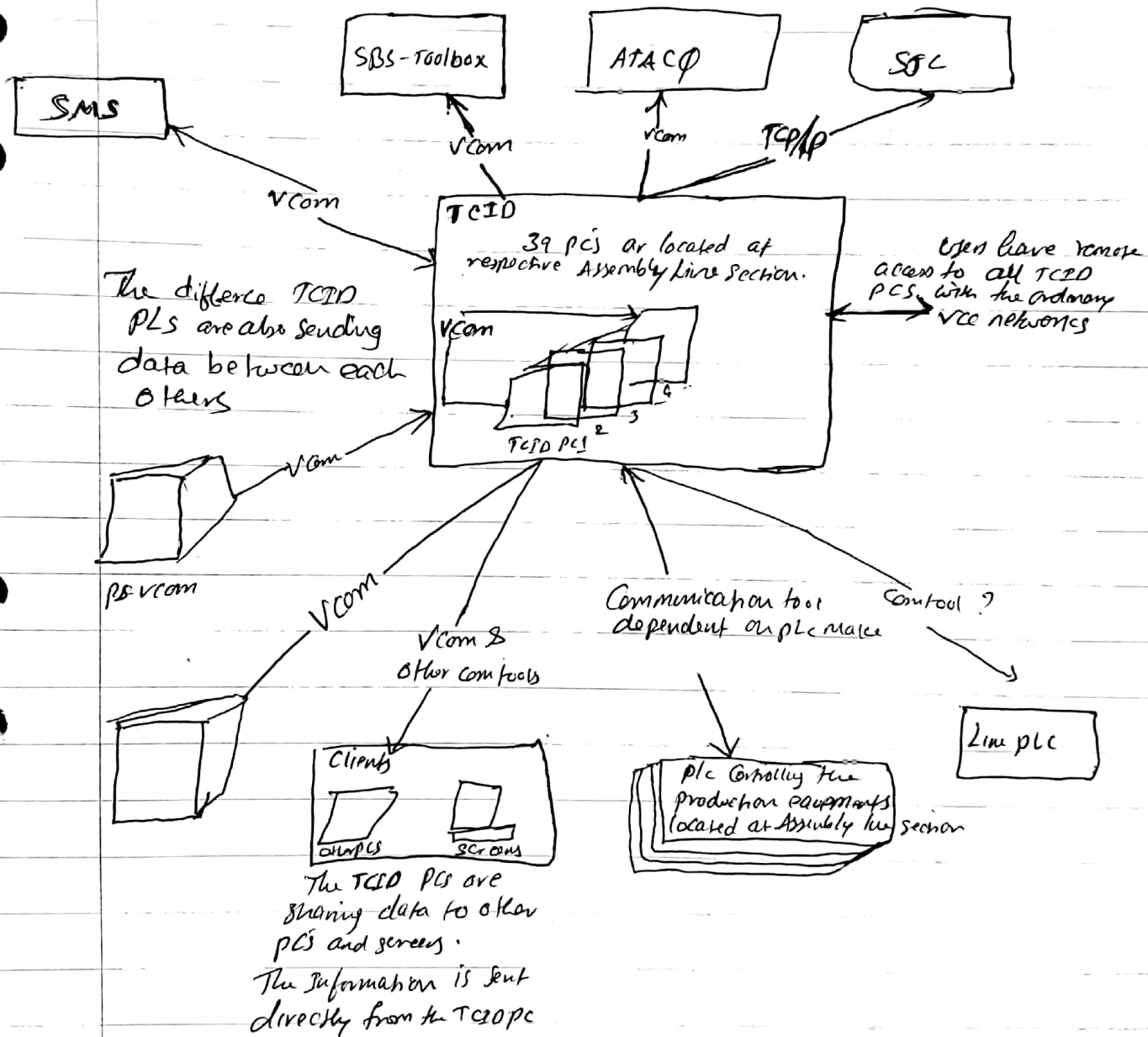
plcs -

PS-vcom is an old application that had been used for different purpose to control plc's in Assembly workshop in Torslanda

Now Application is used for different purposes and may be divided in two main functionalities

~~poka yoka, reye by light, reye assule~~
- Trasfer location information to SAMS.
- Support to handle operations at Pre Assembly Stations.
    (poka yoka & poka yoka Andon2)
- Submit tagging information to the ssc server for plc not Controlled by PS-vcom.

Current It Environment for TCID

SMS

SBS-Toolbox

ATACφ

SFC

vcom

vcom

TCP/IP

Vcom

TCID

39 pc's ar located at respective Assembly Line Section.

Vcom

TCID pc's 1 2 3 4

users have remote access to all TCID PCS with the ordinary vcc networks

The differco TCID PLS are also sending data between each others

Vcom

ßs vcom

Vcom

Vcom & other com tools

Communication too dependent on plc make

Control ?

Clients

other pc screens

The TCID PCS are sharing data to other pc's and screens.

The Information is sent directly from the TCID pc

plc controlling the production equipments located at Assembly line section

Line plc

Scanned by CamScanner

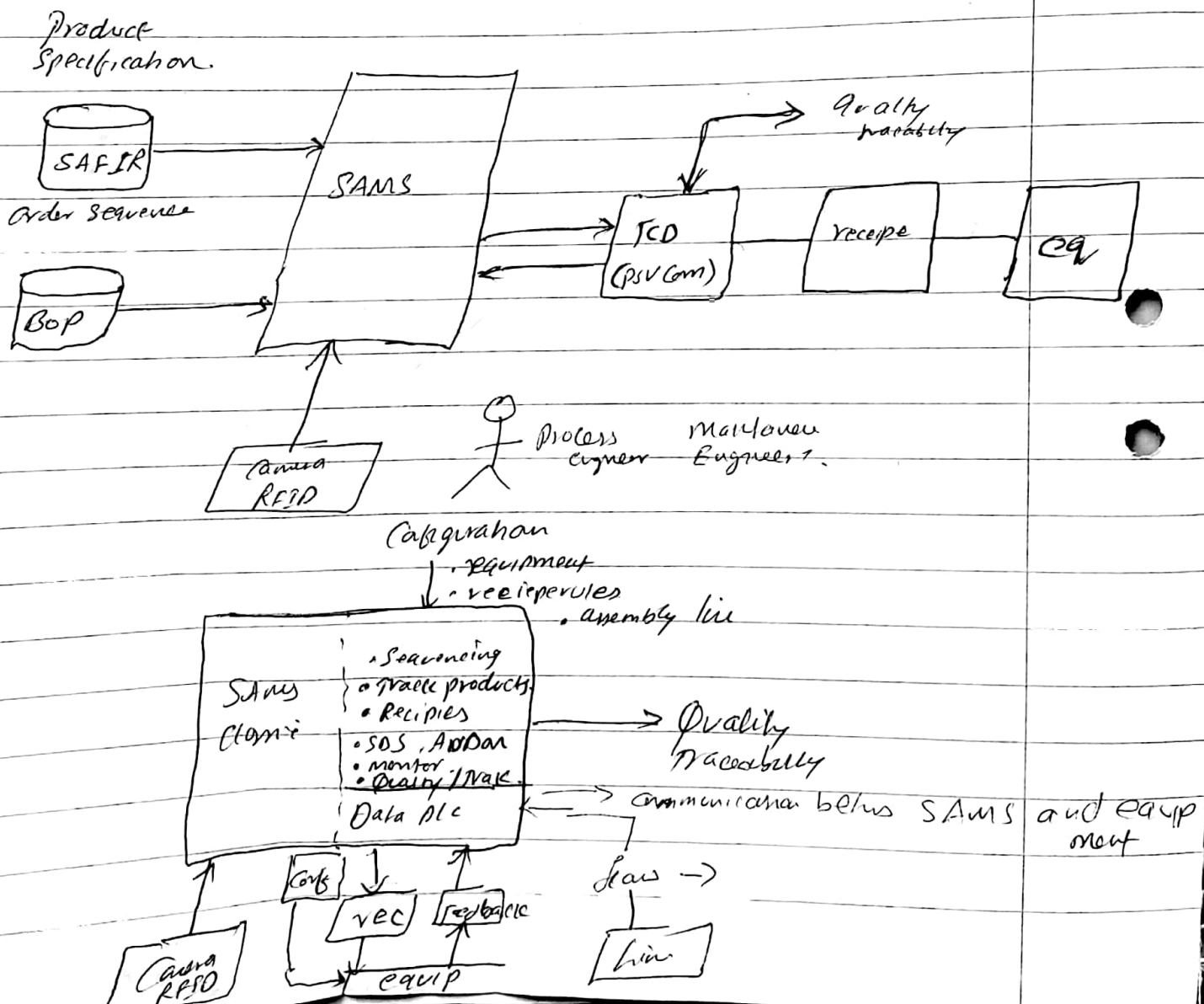Torslanda C-factory. Marriage point is where the car body and engine are put together.
This was implemented and used during 1994 when the 900-series (line1) and the 850-models (line2) was built

A - Shop - body   Assembly line divided into 39 section
D - Shop - painting   Each section has → RFID, came a loader
C Shop - Assembling   → .

Product
Specification.

0779114950

~ vagani
9250
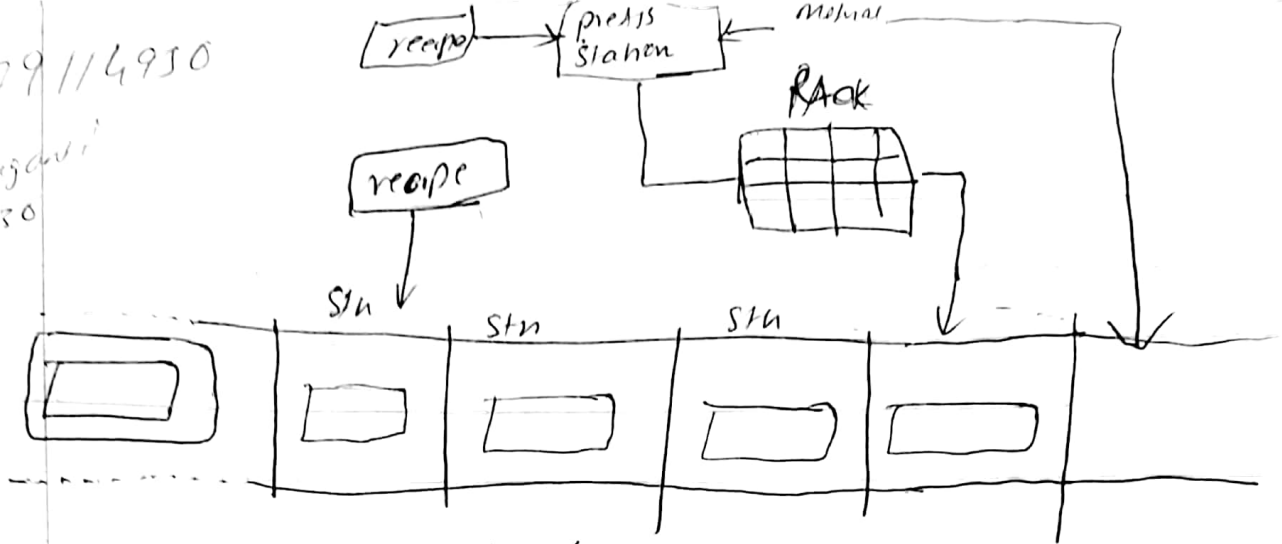
Assembly line section -

Cauhol poka.yoke → doing light thing for the product
(Japanese concept)

SBS → Sequence Balancing Systems/Stems
SJC → Sever for controlling Screw Joints- (one type of equipment)

CSDLGC2
GoT 100 CSDLGC2

(Tracking Controlling and identification System).

facing order ~ cube

CarFlowLog Handler. Java
CIR097 → need to update (or) add logs

BILTYP
CHASSINR
FORBUK
BEOLOPNR
STATIONNR.

```
┌─────────────────┐              ┌──────────────────────────────┐
│ UC - Frontend   │  HTTP        │ WebSphere . Liberty type     │
│ (Angular)       │──JSON───────▶│                              │
└─────────────────┘              │  ┌────────────────────┐      │
                                 │  │ (JAX-RS) API       │      │
                                 │  │ Resources          │      │
                                 │  └────────────────────┘      │
                                 │           │                  │
                                 │           ▼                  │
                                 │  ┌────────────────┐          │
                                 │  │ Service        │          │
                                 │  │ Layer          │          │
                                 │  └────────────────┘          │
                                 │           │                  │
                                 │           ▼                  │      ┌──────────────┐
                                 │  ┌────────────────┐          │      │ JPA entities │
                                 │  │ Data Access    │◀─────────┼─────▶│ (journalise4)│
                                 │  │ Layer          │          │      │              │
                                 │  └────────────────┘          │      └──────────────┘
                                 │           │                  │
                                 └───────────┼──────────────────┘
                                             ▼
                                    ┌────────────────┐
                                    │ Mimer          │
                                    │ DB             │
                                    └────────────────┘
```
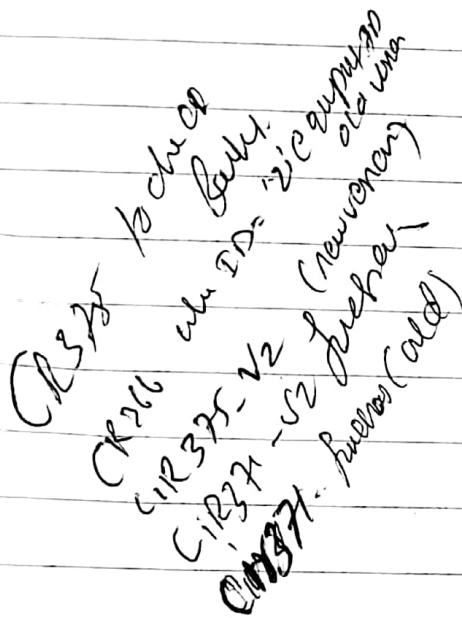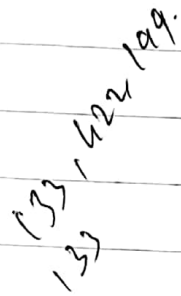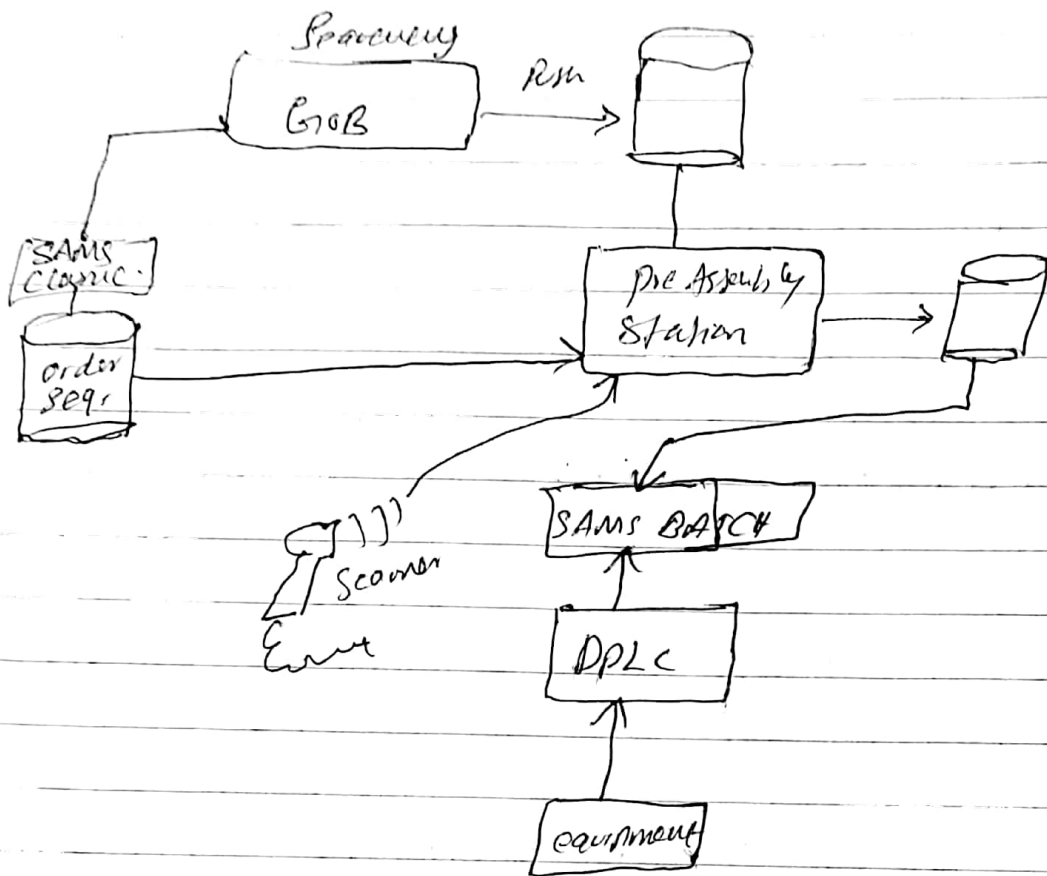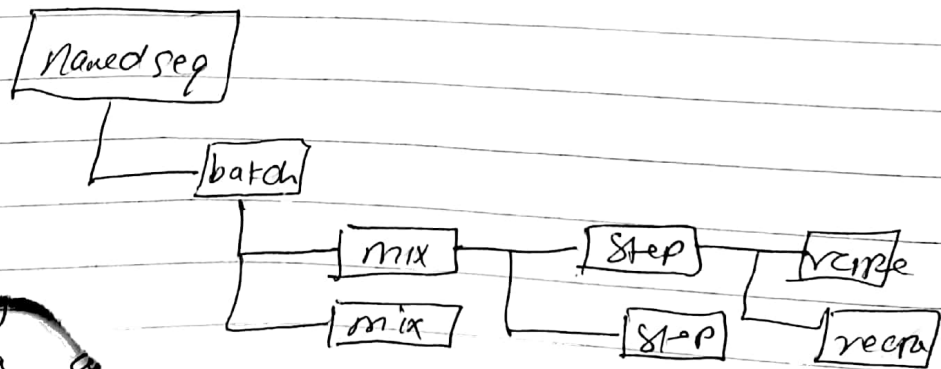
(33 / 422 / 199.

(33

CR375 /0 chuce

CR266   uhu ID- "2/c qupusgp
                        old uha

CiR375-V2 (newvenary)

CiR371 -V2 Juchar

CiR371- Rucvos (old)

GOB-Architecture

Spacewey
GOB → RSM →

SAMS Classic
Order Seq.

Pre Assembly Station →

SAMS BATCH

Scanner
Event

DPLC

equipment

Recipe

Sequencing 4. presauk.

```
        ┌─────────────────────┐
        │ Scauuy 4 pre-answer │
        └──────────┬──────────┘
                   │
        ┌──────────┴──────────┐
        │ Capigrable seq      │
        └──────────┬──────────┘
                   │
        ┌──────────┴──────────┐
        │ Store named seq     │
        └──────────┬──────────┘
    ┌──────────────┼───────────────────────────┐
    │              │                            │
┌───────────┐ ┌──────────────────┐ ┌─────────────────────────┐
│ Capigur   │ │ Configure Station│ │ locu  and store         │
│ named      │ │ to use named·seq │ │ seque (mix nes) form GroB│
│ sequenes   │ └──────────────────┘ └─────────────────────────┘
└───────────┘
```

```
                    ┌───────┐
                    │ Gruf  │
                    └───┬───┘
                        │
                    ┌───┴───┐
                    │ API   │
                    └───┬───┘
                        │
┌───────┐  ┌───────┐    │      ┌────────┐
│ GroB  ├──┤ msg   ├──▶ DB  ──▶│ creau  │
└───────┘  └───────┘  (DB)     │ recipi │
                               └────────┘
```

```
┌────────────┐
│ Named seq  │
└─────┬──────┘
      │
      └──────┐
         ┌───┴────┐
         │ batch  │
         └───┬────┘
    ┌────────┴────────────────────────────┐
 ┌──────┐      ┌──────┐       ┌────────┐
 │ mix  │──────┤ Step ├───────┤ recipe │
 └──────┘      └──────┘       └────────┘
 ┌──────┐      ┌──────┐       ┌────────┐
 │ mix  │──────┤ Step ├───────┤ recipu │
 └──────┘      └──────┘       └────────┘
```

→ Usi
data a
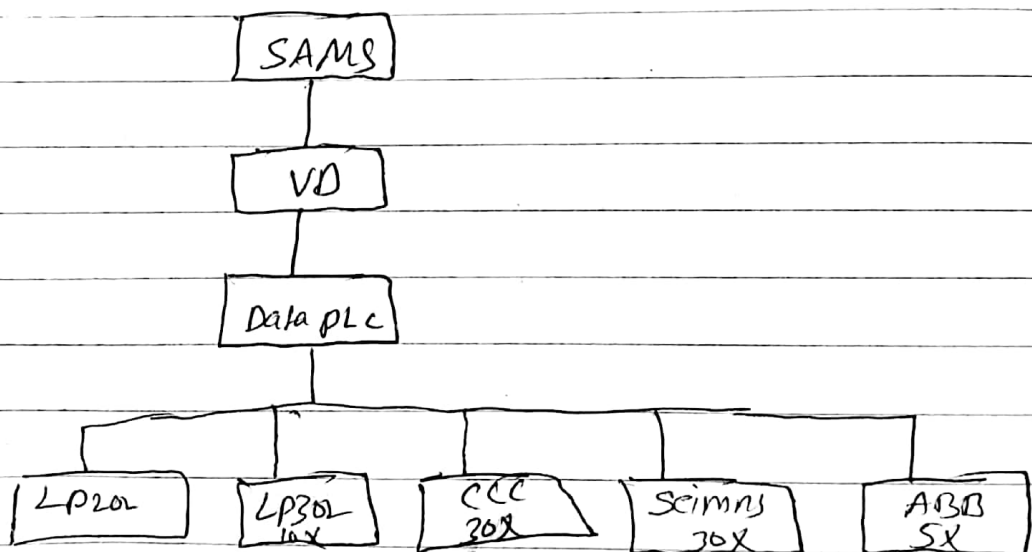
Database - Development

Cir353

POC System Capacity - Design verified

1. Each line has its own processes in VD and SAMS
2. Each line has its own physical Data plc
3. The Data plc is designed for the number of equipment PLCs per line seen in the diagram, which means we have a future capacity of aprox. 4000 pics in C-shop.

Design per line

```
        ┌────────┐
        │  SAMS  │
        └────────┘
            │
        ┌────────┐
        │   VD   │
        └────────┘
            │
        ┌──────────┐
        │ Data PLc │
        └──────────┘
            │
   ┌────┬────┼────────┬──────────┐
┌──────┐ ┌──────┐ ┌──────┐ ┌────────┐ ┌──────┐
│LP202 │ │LP302 │ │ CCC  │ │Siemens │ │ ABB  │
│      │ │ 10X  │ │ 20X  │ │  30X   │ │  5X  │
└──────┘ └──────┘ └──────┘ └────────┘ └──────┘
```

POC Funtional Test

- Request, create and distribute recipies from SAMS to LP202
- Request line info from the line plc = ✓
- manage inventory in SAMS and update Data PL
- manage Configuration in SAMS and update LP202

type Sams_com: Samsbatch-common.com
@ Sams_Com: Samsbatch_common.com
@ Sams_com: Samsbatch

Application

SAMSweb → Gui and Backend deployed on webspheare. Configuration and monitoring of equipment and Recipes

SAMSBatch → Background process on open VMS - one instance per Data plc. Generating and distributing Information to the shop floor and collecting Results.

VD → Virtual Device application for Communication between ST and Shop floor - one instance per Data plc
— one instance per Data plc

Data plc: one plc per assembly line Section with the various Stations and equipment

Application Functional Knowledge:

Communication between SAMS Batch and VD is by VCom.
           every process will have its own expediter and partner

Communication between VD and the Data PLC is done by the VD com protocol.

Communication between SAMSBatch and SAMSweb uses single single partner/expediter pair for

for sending messages to and receiving message from the web application

To send messages to SAMSBatch, SAMSweb uses corresponding Vcom partner for every SAMSBatch listener. So that message from VD and from SAMSweb are read from the same queue
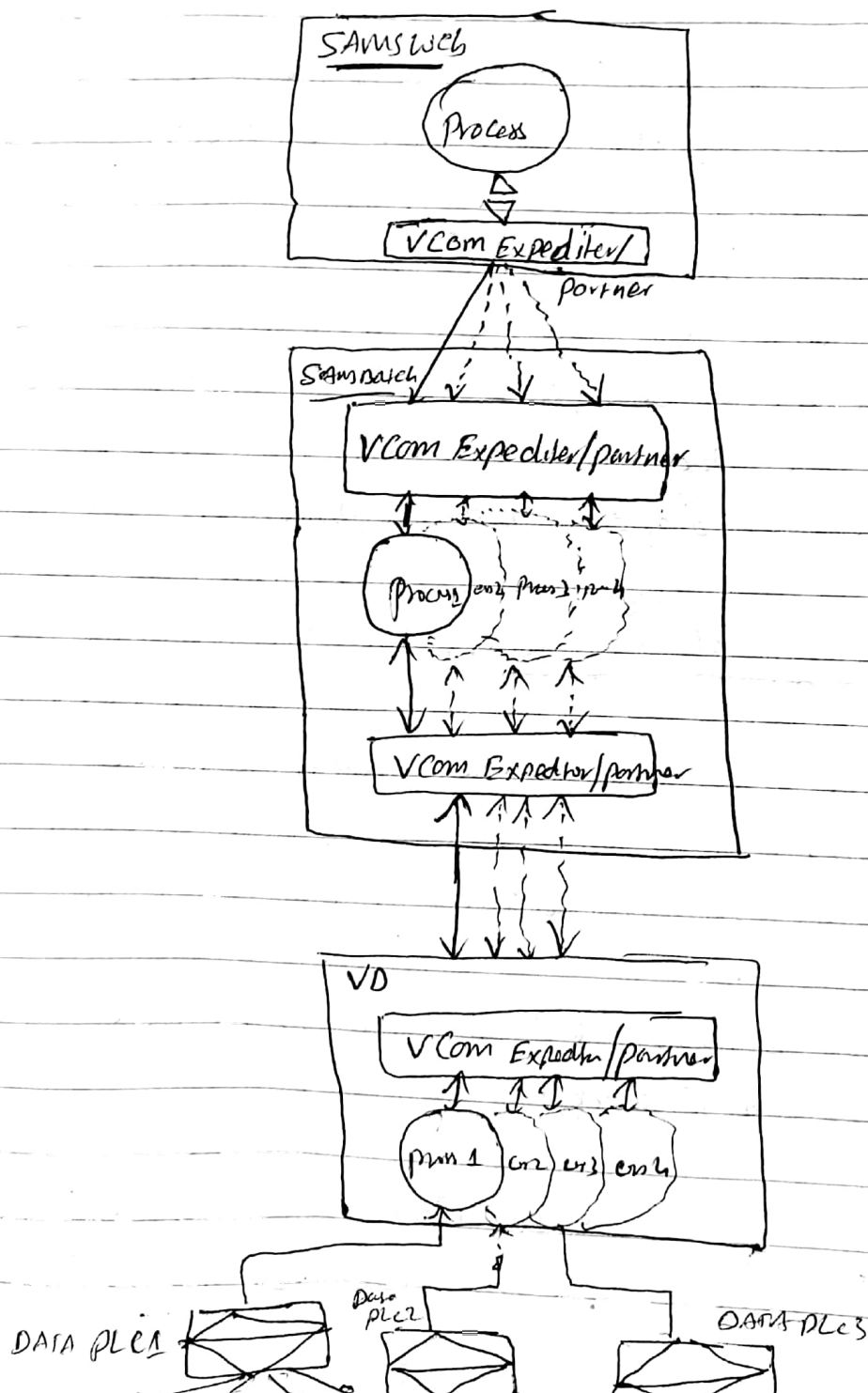
Architecture

SAMS

It manages location of production objects as they move through the plant together with a local application called TCID (Transaction Control and Identification)

SAMS is responsible for managing the object specific data for each production object through the plant, and communicating this data and other specific informations to different systems

TCID Uses their information to create equipment Recipes and control codes

Project Description:

Business objective:1:- Reduce risk for production stop in VCT C-factory

The Business goal to have the TCID Systems replaced, is based on the target to create resilience and Significantly reduce the risk for assembly line manufacturing interruptions or incidents at VCT

Busines object-2: - Long term cost reduction thru Strategic planning for common factory system. Secure that implemented IT Solution has a direction that makes it possible to use for other factories than VCT
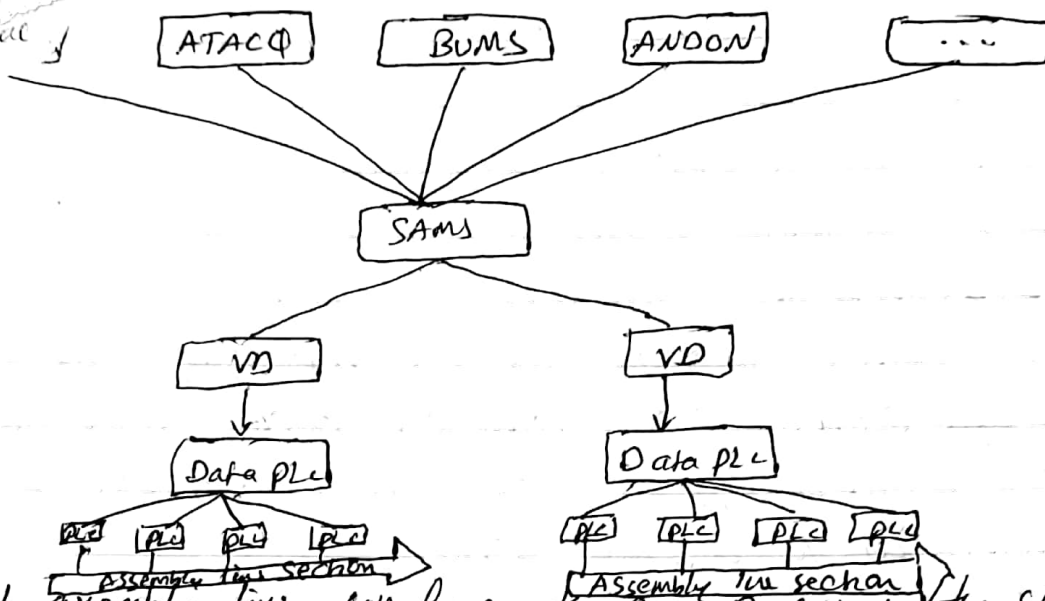
Each assembly line will have its own process in the SAMS System, If own VO processes and its own plc

This first of all to ensure performance, throughput, response times and high Concurrency.

But it also to meant to ensure that the impact of an incident is reduced to one subassembly, and not a larger part of the factory,

The part of middle is Covered by the project scope

- Creating Proper SAMS Processes, and setting up the Instances.
- Setting up relevant VO Instances
- Creating the PLC Software, and setting up the Instances. — one for each line and 1 for preassembly

Systems behind SAMS are not to be Changed, Exept for Reconfiguration of Various System parameters, Such as host names, Channel names & c.