



Current state digital work instructions at Swegon

2023-05-10

Our purpose in the world

We enable healthy and comfortable indoor environments for people to be at their best, today and tomorrow.



The Kvänum Factory



9 000 AHU/year

5 Final assembly lines

Set takt-time Mixed model assembly

AHU Configurations (From assembly)	Modules	Options
86 986 368 089 038 900	3 267	6 731

Digital work instructions

1 Plant

7 Lines

90 Cells

24 000 Process steps

125 000 Instruction Rows

- Order data and configuration from ERP
- Each process step is coded for which configurations it is used
- The operator sees only the process steps needed for the current order configuration and in the correct order

1. Förmontera gångjärn-och bygelstolpe + 2 st...	25255	-00:14
2. Klipp korta lister till filterstolpar	25270	+00:36
3. Grada 2 st transportstag	28306	+01:30
4. Byt vagn, starta ny order	25423	+00:40

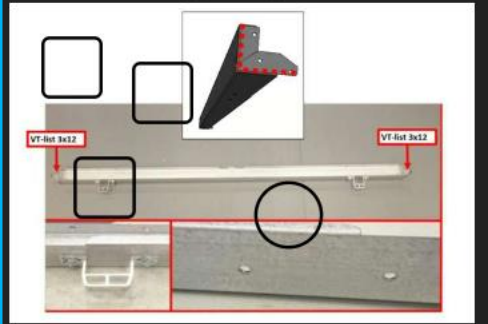
Work instructions

Förmontera gångjärn-och bygelstolpe + 2 st täckplåtar



Overview image showing finished result on current step – usually only information needed for experienced Operators

1. Förmontera bygelstolpe.



Montera 2 st byglar M6x16 (010899) och lista med VT-list 3x12.

2. Förmontera gångjärnsstolpe.



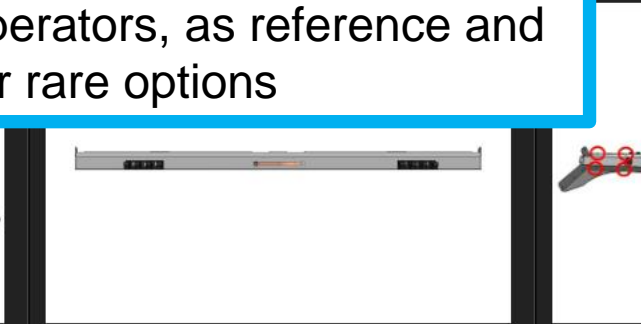
Montera 2 st gångjärn M6x16 (010899) och lista med VT-list 3x12

3. Kitta i hörnen



Kittspruta, smeta ut efter.

4. Montera täckplåtar



M6x16 (010899) Wingspe

-00:14
02:32

08:29:31

Johan Andersson, -

Logout

1. Förmontera gångjärn-och bygelstolpe + 2 s...
25255-00:14

2. Klipp korta lister till filterstolpar
25270+00:36

3. Grada 2 st transportstag
28306+01:30

4. Byt vagn, starta ny order
25423+00:40

Process Steps

Current step with remaining time for the step

Indicated step on which the operator should be

Steps not yet started

Allcated time per step

Förmontera gångjärn-och bygelstolpe + 2 st täckplåtar

1. Förmontera bygelstolpe.

2. Förmontera gångjärnsstolpe.

3. Kitta i hörnen

4. Montera jordfläta

5. Montera

Order status

Order time status on validated steps

Remaining Takt or Order time

02:32

TAKT TIMER
02:32 (00:14 of 02:46)

SEQ NR
1825001

WORK ORDER
2006431864 B04 EL

PRODUCT
FLFIV011-012F 2006431864 B04 EL -

CURRENT BUILD
382

FIFO IDENTIFIER VALUE

VALIDATED # OF # AVAILABLE
0 of 1 (0.00 %)

ANDON

REPORT INTERFERENCE

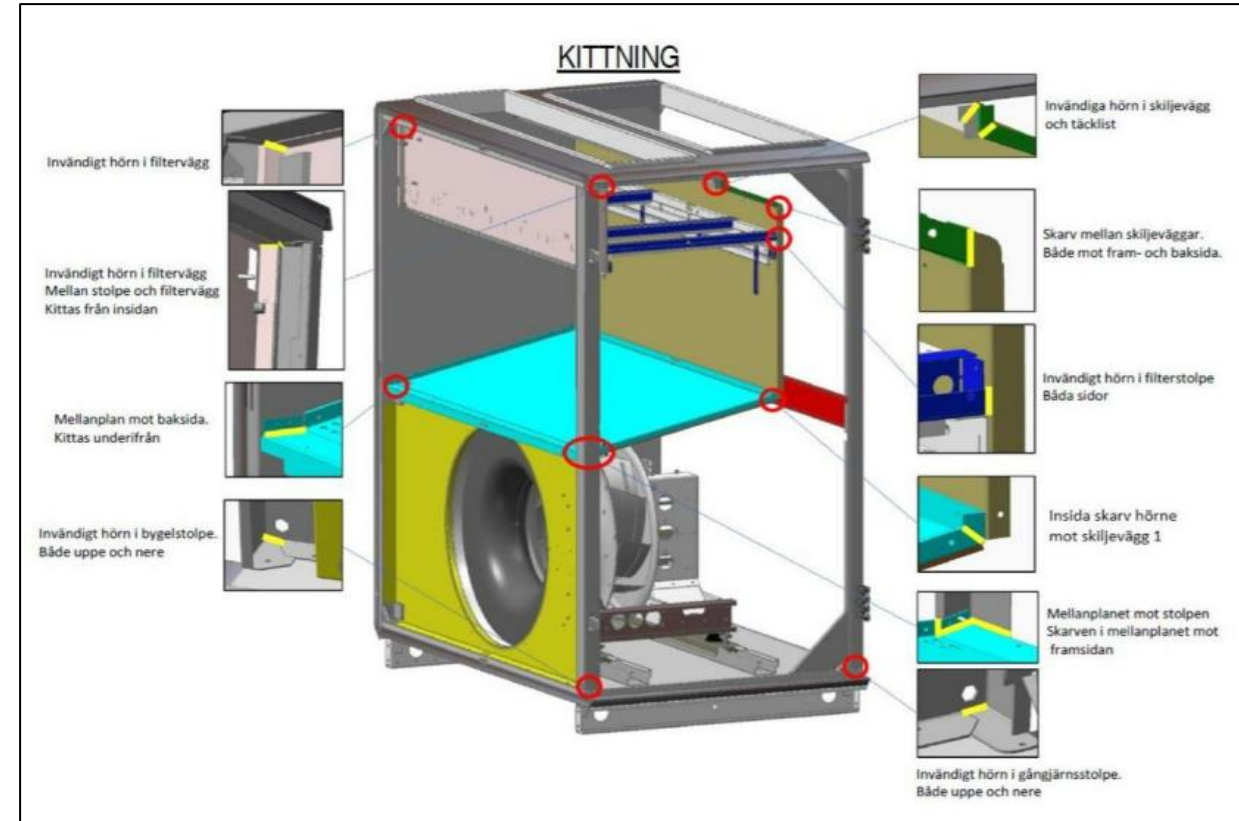
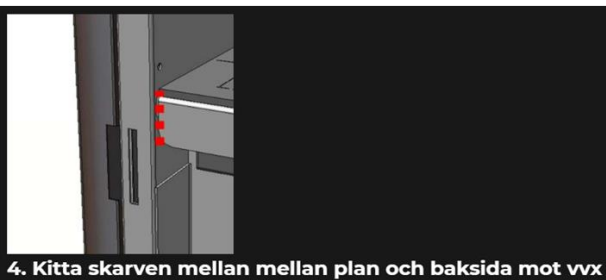
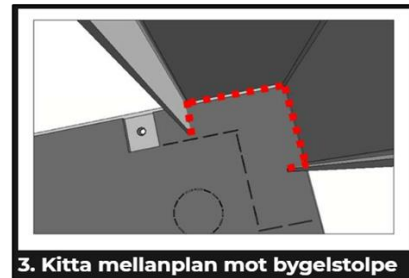
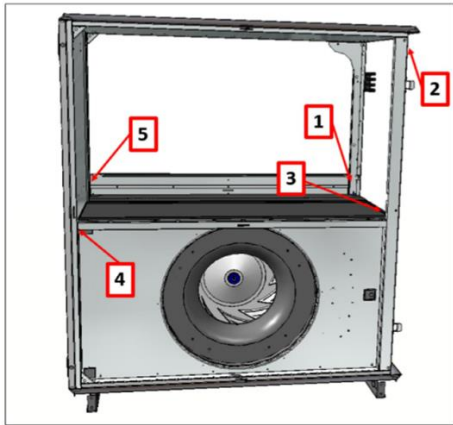
VALIDATE

Operator challenge

- Operators cannot choose which orders or configurations they work on
- Rare configurations should be completed with same level of efficiency and quality
- Assembling different configurations with similar design, how are they different?
- What is important for me as an operator to keep track of?

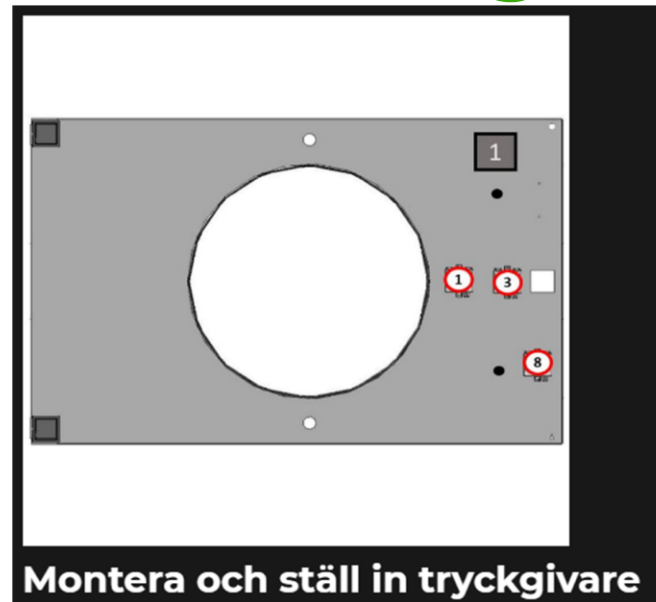
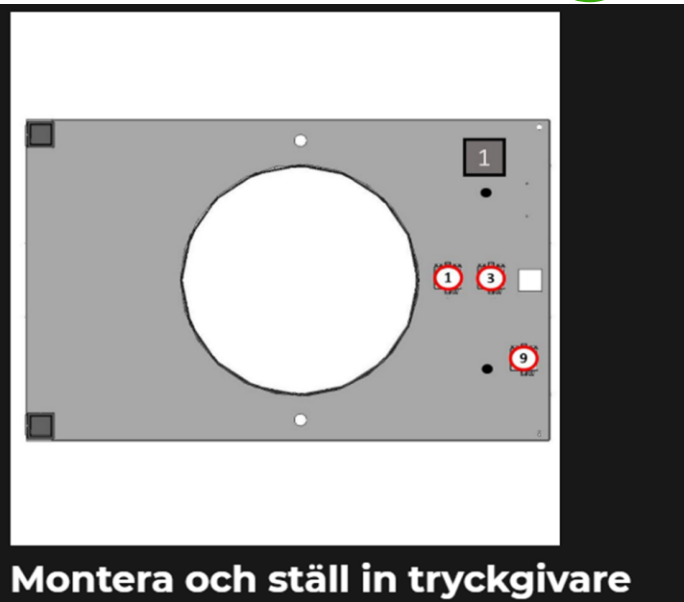


Challenge #1 Different design styles

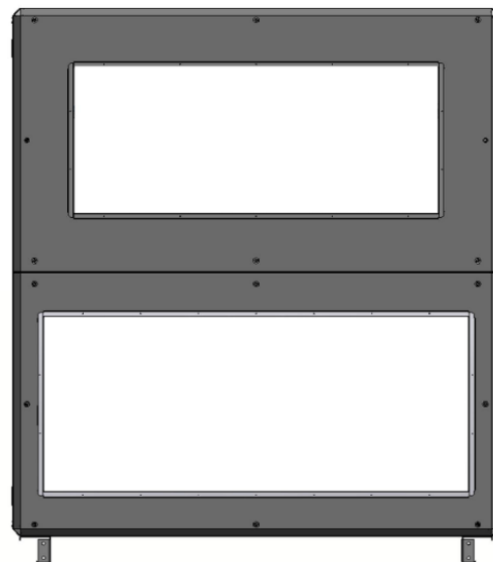
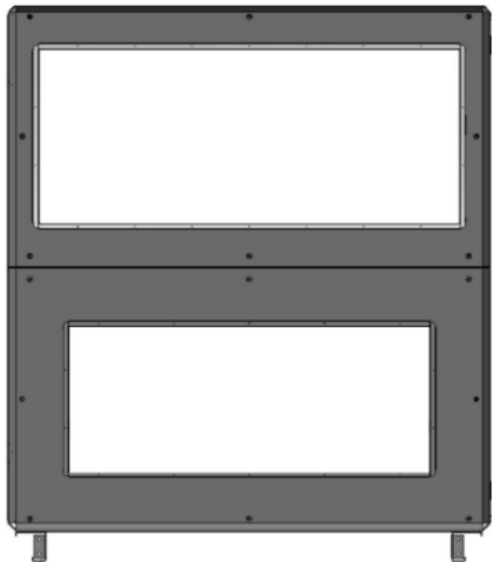


- Different designs by different preparers
- Preparers work by product, not by process

Challenge #2 Sorting the information **Swegon**



- Differences and Commonalities are indicated in the same way
- Information of different importance is indicated in the same way



To do:

Organization

- Work instructions on the same cell / work type / product part type needs to be designed as a complete information package

Design manual

- Define visual elements
 - Arrows, Text, Notations, Symbols etc.
- Define types of information and how they should be visualized
 - Variant differences, Quality highlights, Safety highlights etc.



Feel good **inside**



Current state in industry

DIGITALa arbetsInStruktioner för kognitivt arbete –
DIGITALIS

Results captured by:

*Sandra Mattsson, Ari Kolbeinsson, Urban Turesson,
Martin Kurdve & Peter Thorvald (project leader)*



Need summarized

1. Simplify the design of instructions
(for design preparation)

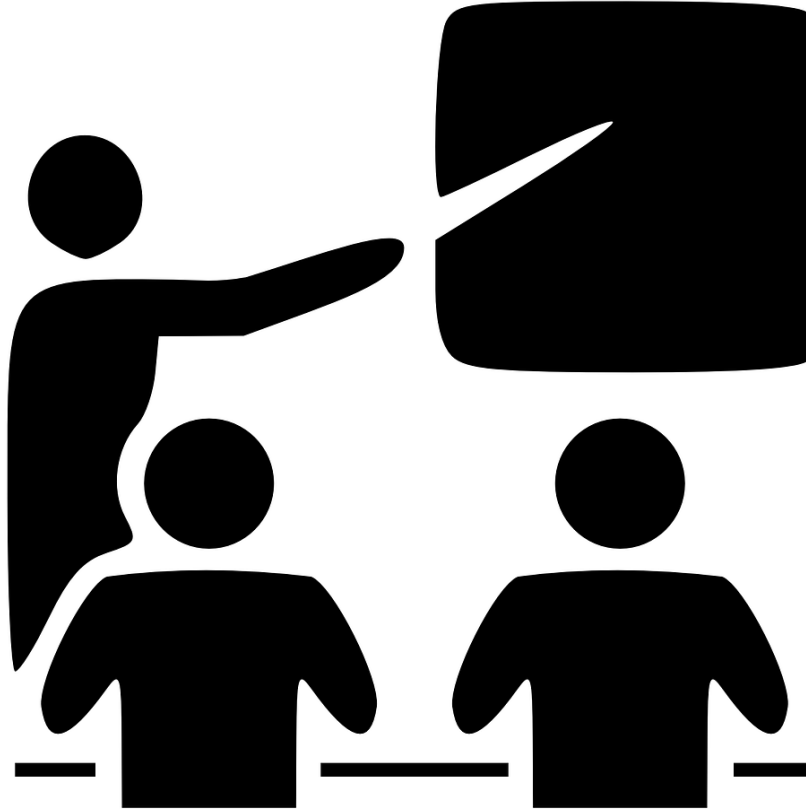
2. Reduce training/learning times

3. Visualize process updates

4. Knowledge increase in general

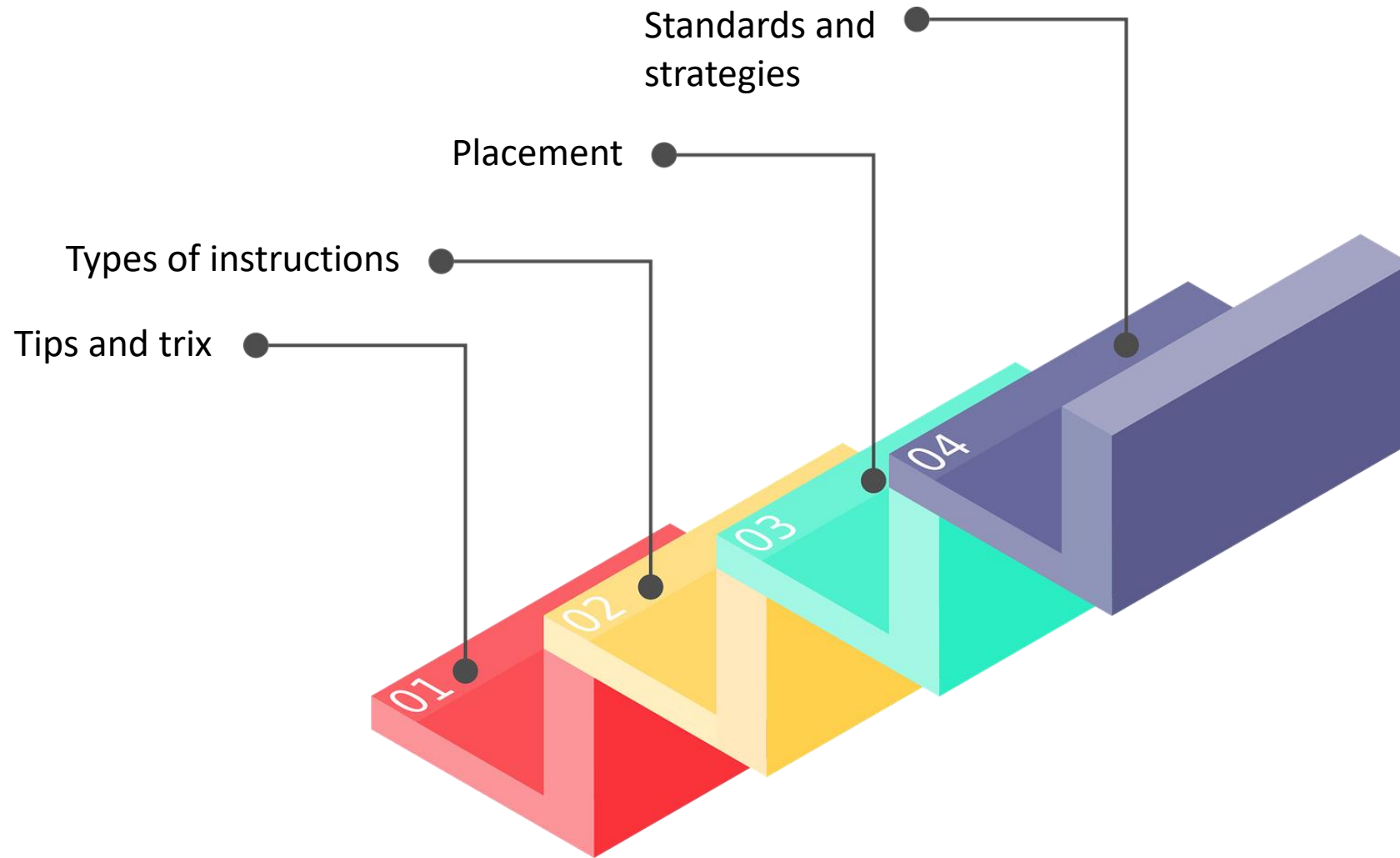
Main findings (2/4)

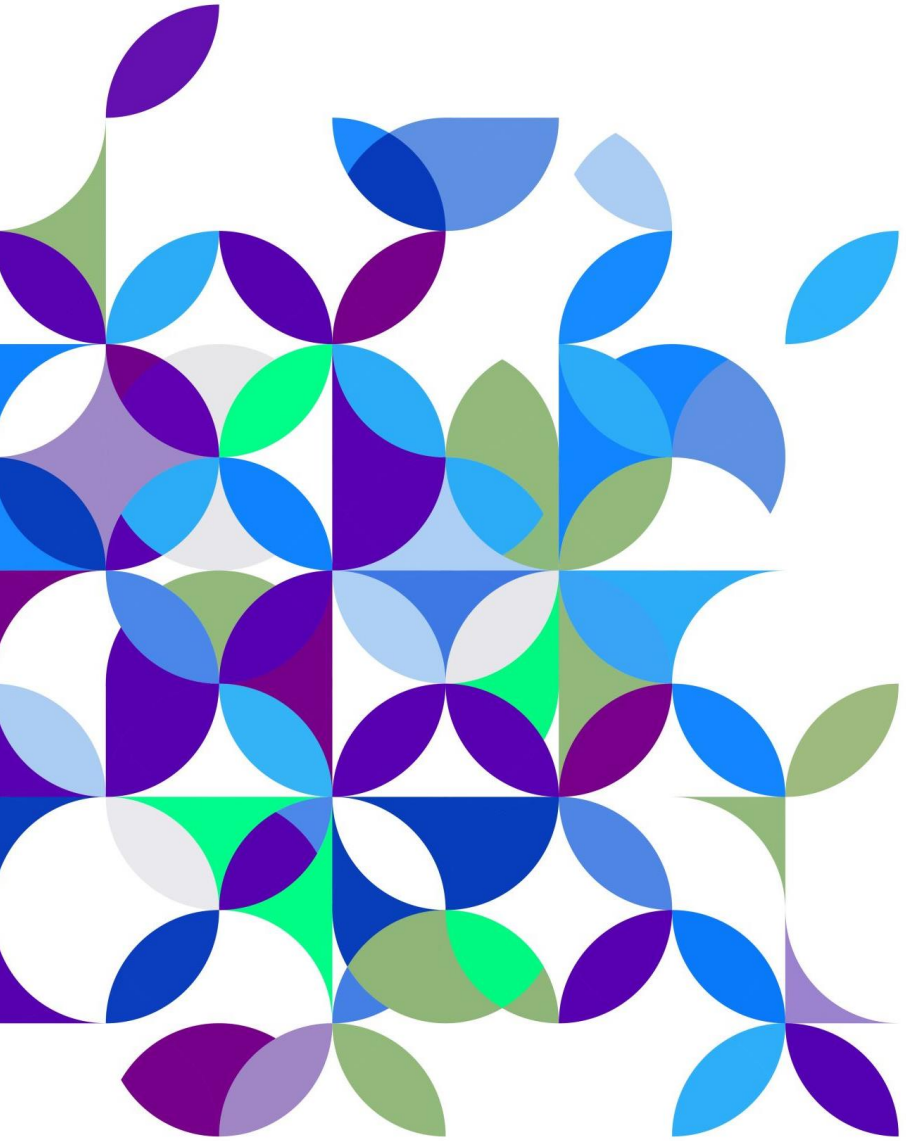
2. Reduce training/learning times



Main findings (4/4)

4. Knowledge increase in general



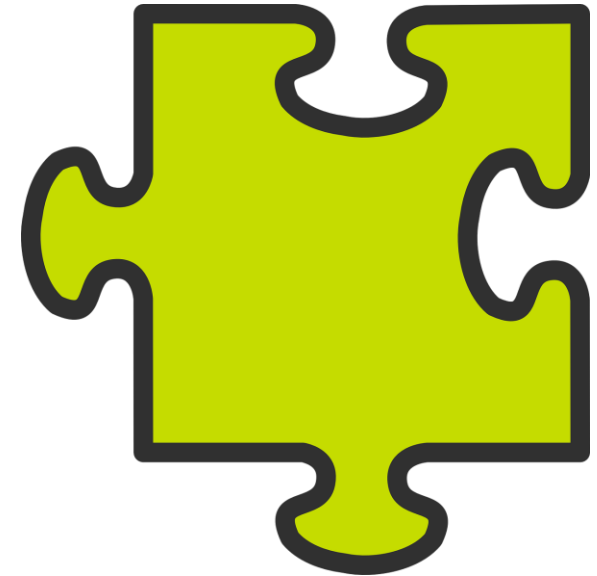


Company visits method

- 1-day visits on: Swegon, Saab Linköping and Kallebäck, Husmuttern, Volvo GTO, CEJN
- Agenda
 - Introduction company and case
 - Tour in plant
 - Interviews with assembly personell
 - Questionnaire 18 questions
 - Summary and discussion of next steps
- Report in June

Main findings (3/4)

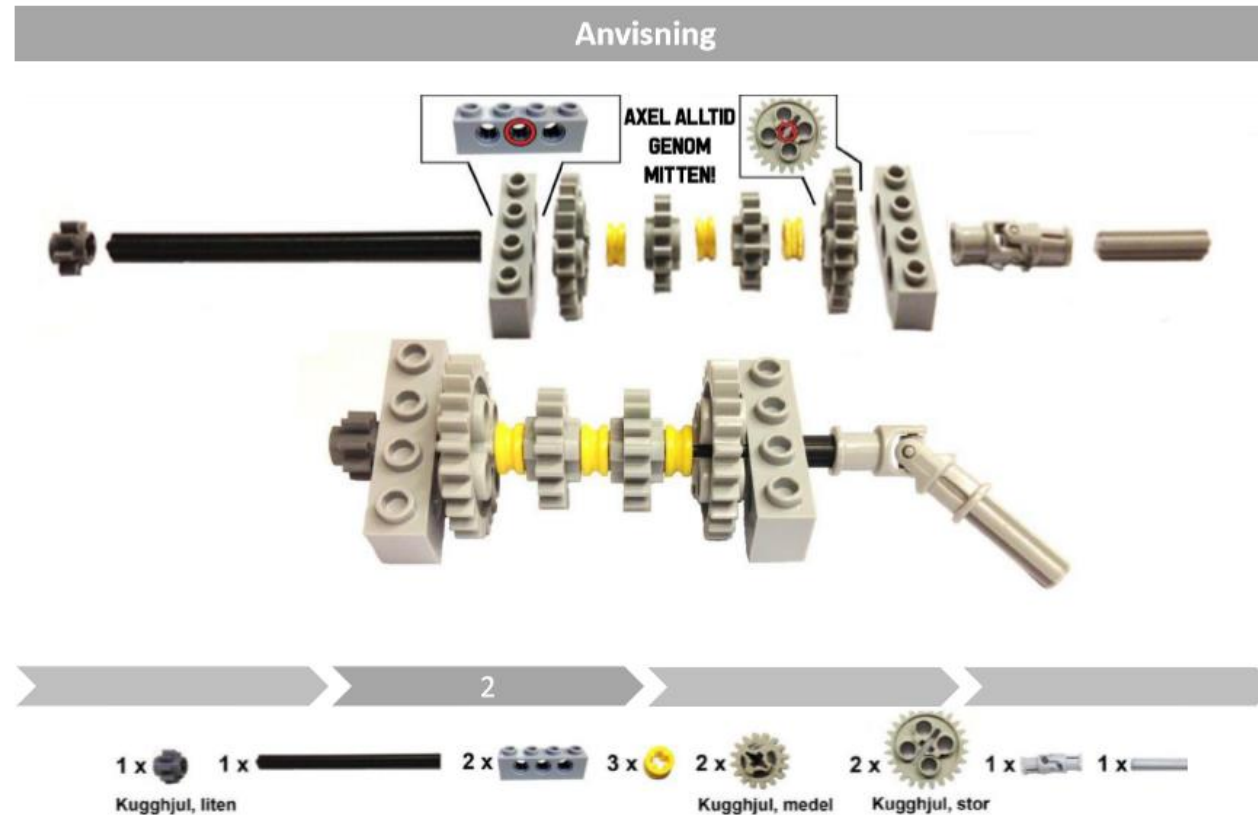
3. Visualize process updates



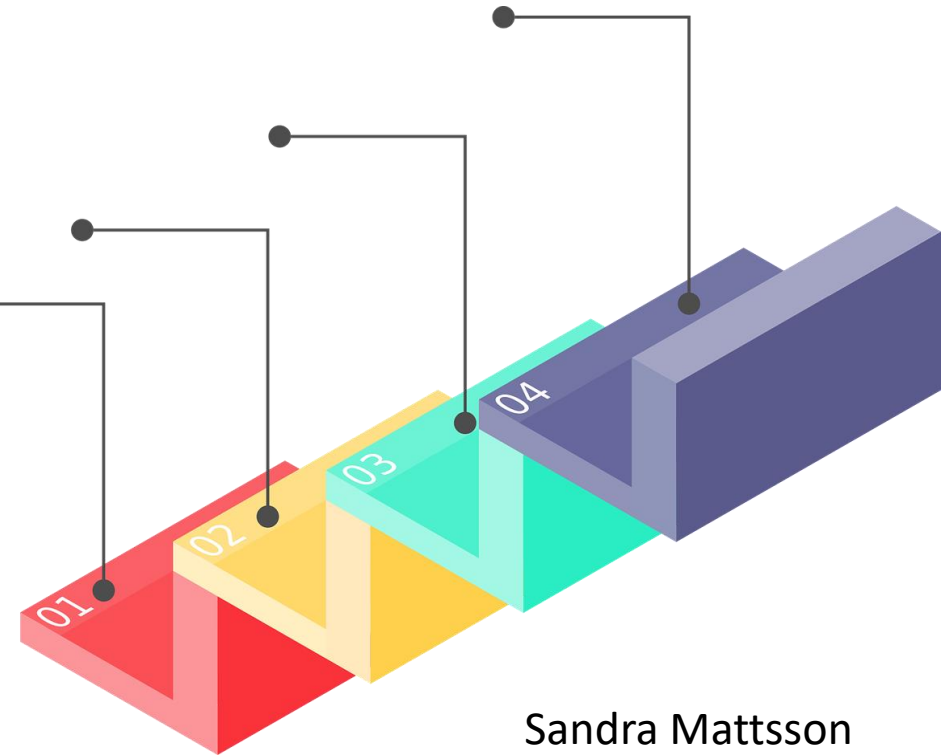
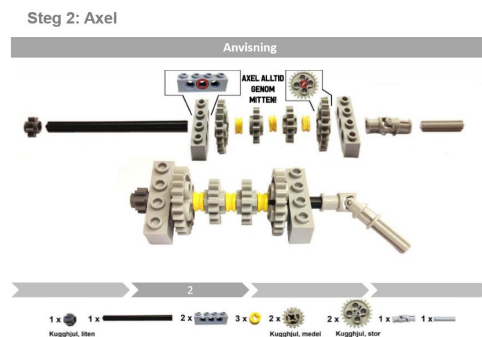
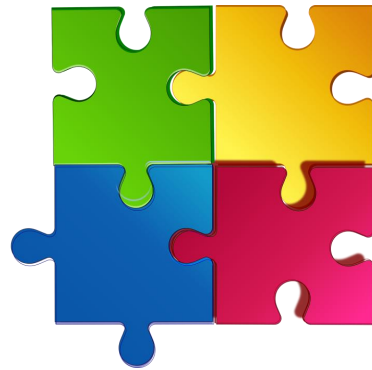
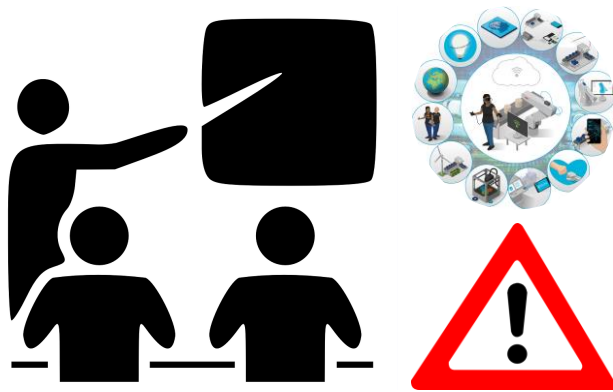
Main findings (1/4)

1. Simplify the design of instructions (for design preparation)

Steg 2: Axel



More from the project



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