

## 1. Context



[1] Stäubli is an innovative mechatronic solutions provider with three dedicated divisions: **Textile**, **Connectors** and **Robotics**. With a workforce of over 4000, the company generates a yearly turnover surpassing 1 billion Swiss francs. In 1997, Stäubli opened its first production site of Asia in Hangzhou, China.

### Stäubli Textile



### Stäubli Robotics

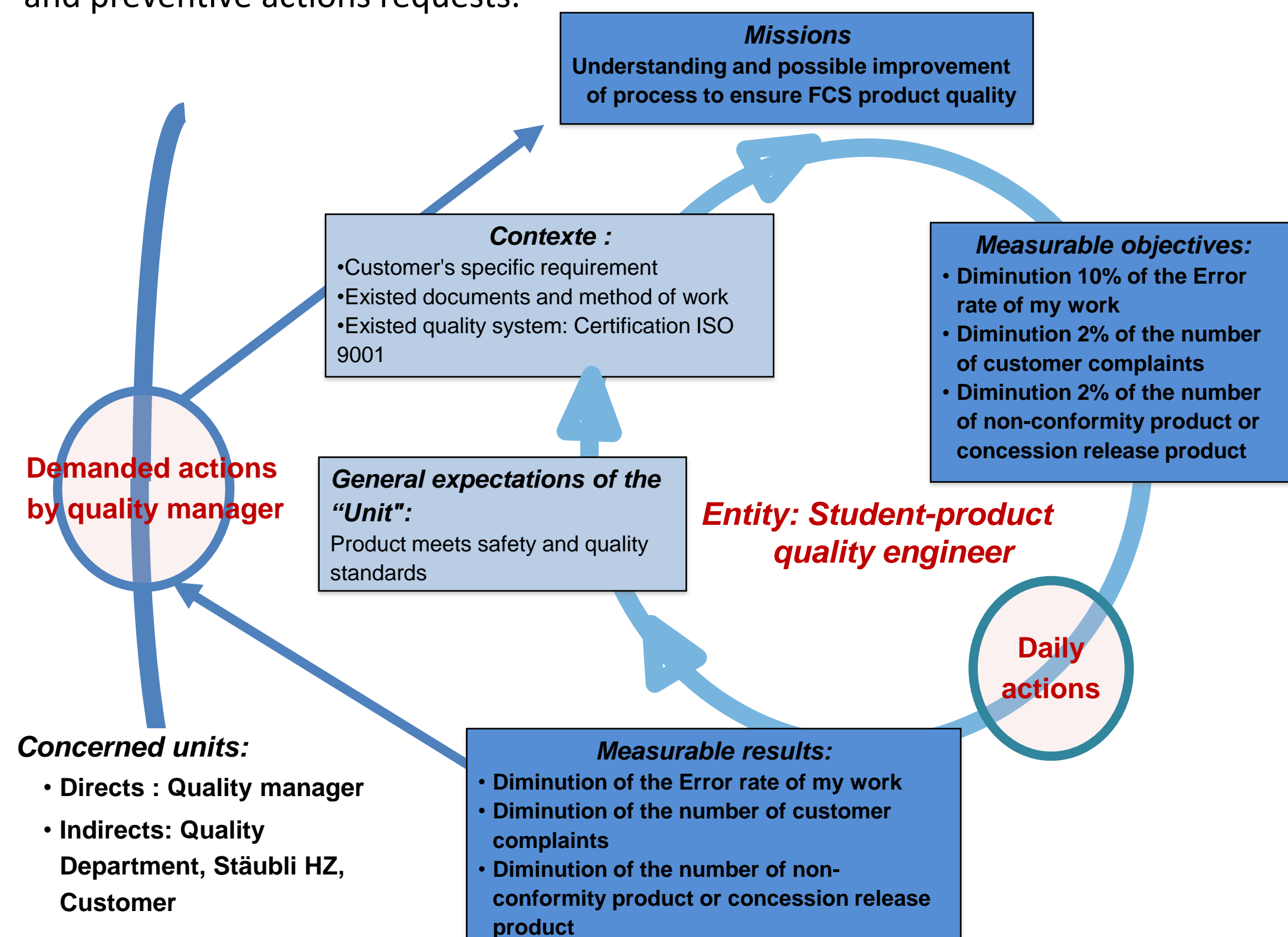


### Stäubli Connectors



## 2. Missions & Strategy

Definition: **Product quality management** is a comprehensive set of tools that enables organizations to control and manage the activities related to product quality across enterprises. The activities include product and manufacturing defects, field failures, customer complaints, product improvements and corrective and preventive actions requests.



This internship has allowed me to perform the following tasks:

### Part 1: Quality control of FCS products

- 1 Troubleshooting on the production line
- 2 Process control and final inspection of product
- 3 Management of the local supplier of platen for QMC 122

### Part 2: Management of customer complaints

- 4 Dealing with customer complaints
- 5 Adherence to and implementation of corrective and preventive actions

## 3. Product presentation



### Quick mould clamping systems (QMC)

Quick mould clamping systems are designed to implement the rapid alteration and swapping out of moulds, particularly in the **Plastics Industry**.

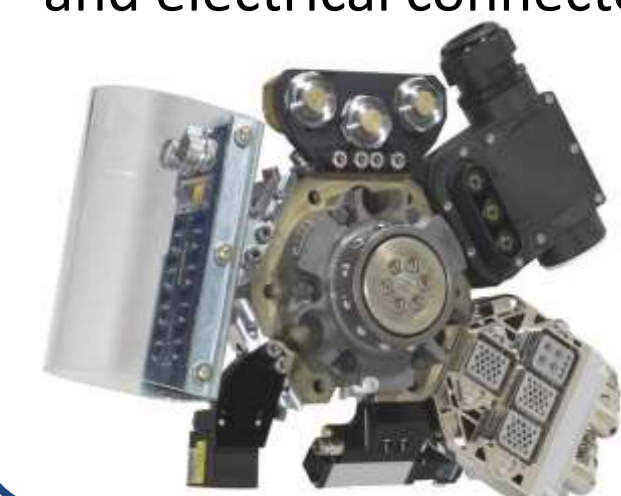
### Multi-coupling systems (MCS)

Perform simultaneous connections of all fluid and electrical lines in **nearly all industrial sectors**. Different modules are available: Modular couplings and electrical connectors etc.



### Robot tool changer systems (MPS)

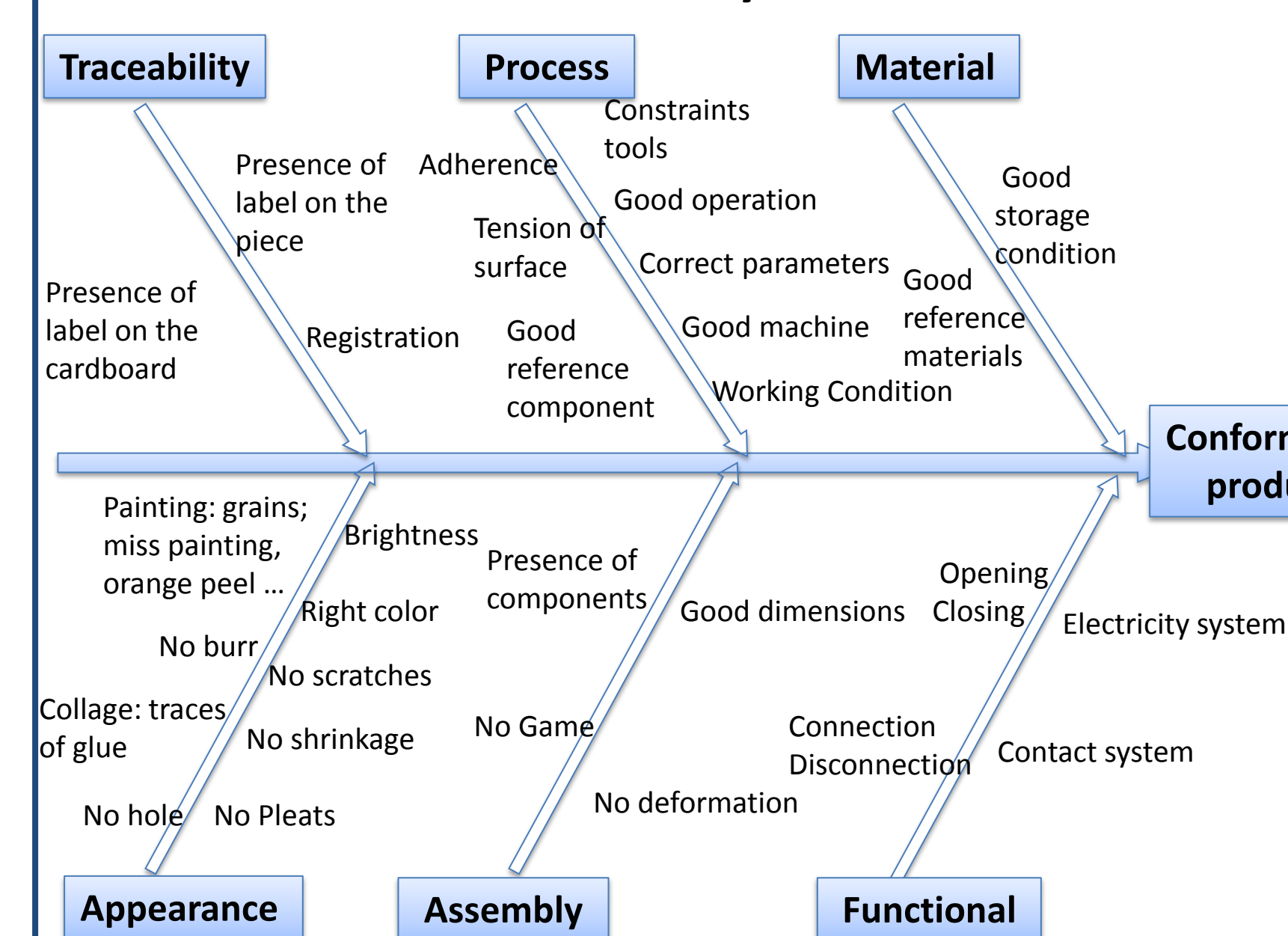
The MPS is solely used to change tools (such as welding tongs, grapples, etc.) predominately on industrial robots and handling units in automated production lines of **automotive industry**.



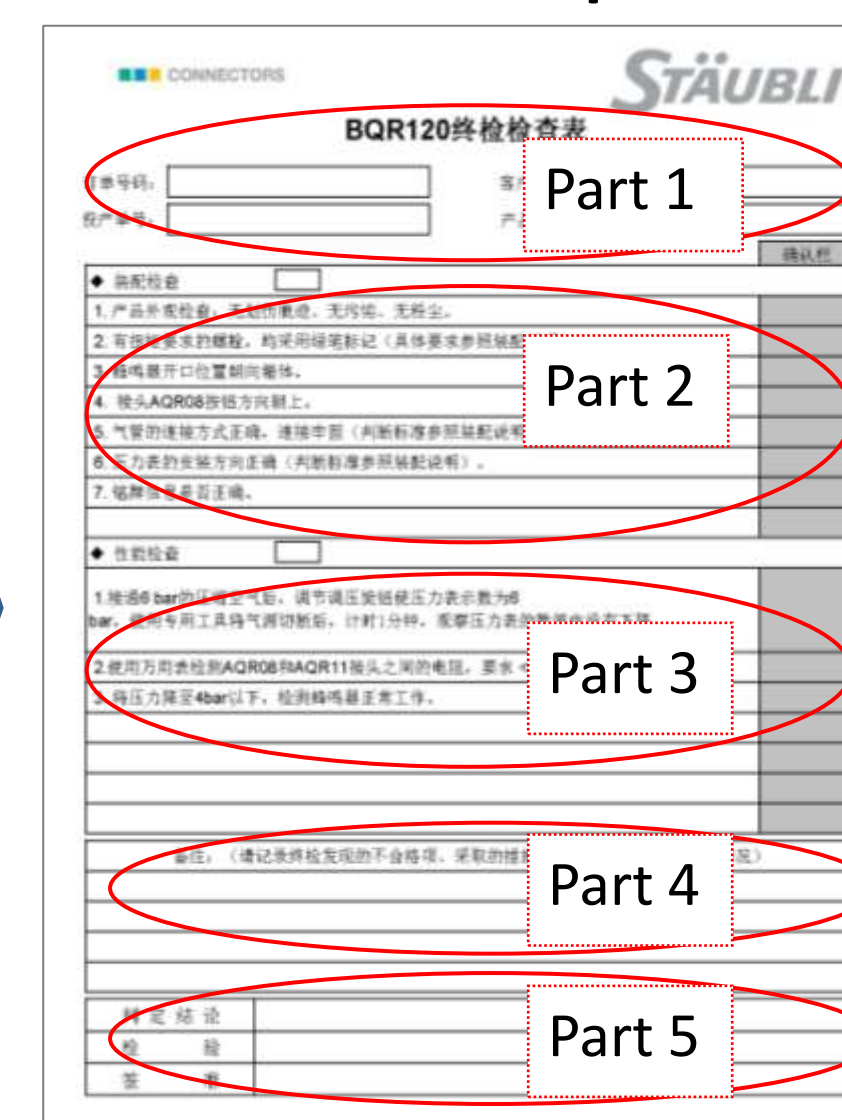
## 4. Methodology

- Plan and define the control methods, identify the manufacturing process

### Identification of the key characteristics



### Establishment of inspection sheet



Part 1: General information: order number, customer, part number  
Part 2: Items of the assembly inspection  
Part 3: Items of the functional inspection  
Part 4: Other remarks  
Part 5: Final analysis conclusion (Ok/NOK), the signature of inspector and approve engineer.

- Propose action plans

The action plans are proposed according to the analysis of quality indicators.

The most significant items should be prioritized. The actions can be:

- ✓ Corrective actions for short term
- ✓ Preventive actions for long term

- Improvement of control plan

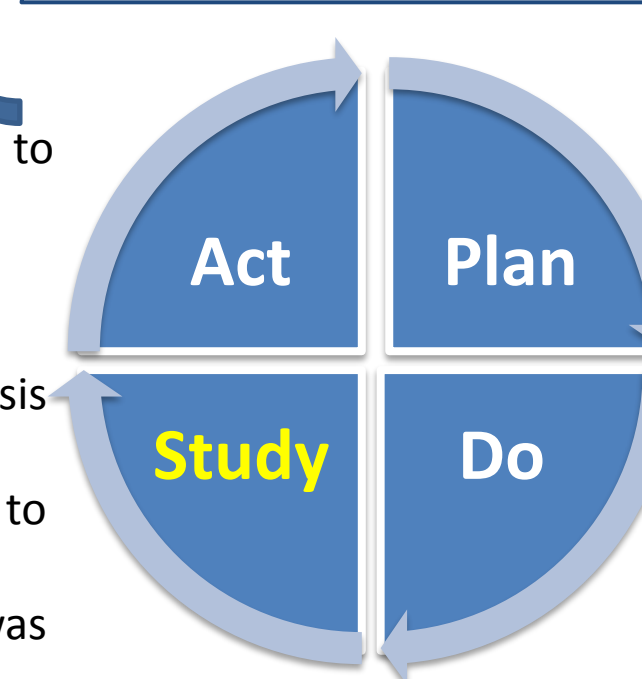
For the improvement of the control plan, there must be compelling reasons to propose our parent company make changes.

The action plans can be progressed in different ways. It can be concluded by the practice of PDCA.

### Improvement: practice of PDCA method [5]

#### Model for Improvement

What are we trying to accomplish?  
How will we know that a change is an improvement?  
What change can we make that will result in improvement?



- What changes are to be made?
- Next cycle?

- Complete the analysis of the data
- Compare data to predictions
- Summarize what was learned

- Objective
- Questions and predictions
- Plan to carry out the cycle
- Carry out the plan
- Document problems and unexpected observations
- Begin analysis of the data

- Make the products, Monitor, measure and test the making products

### Procedure of "product quality control"[3]

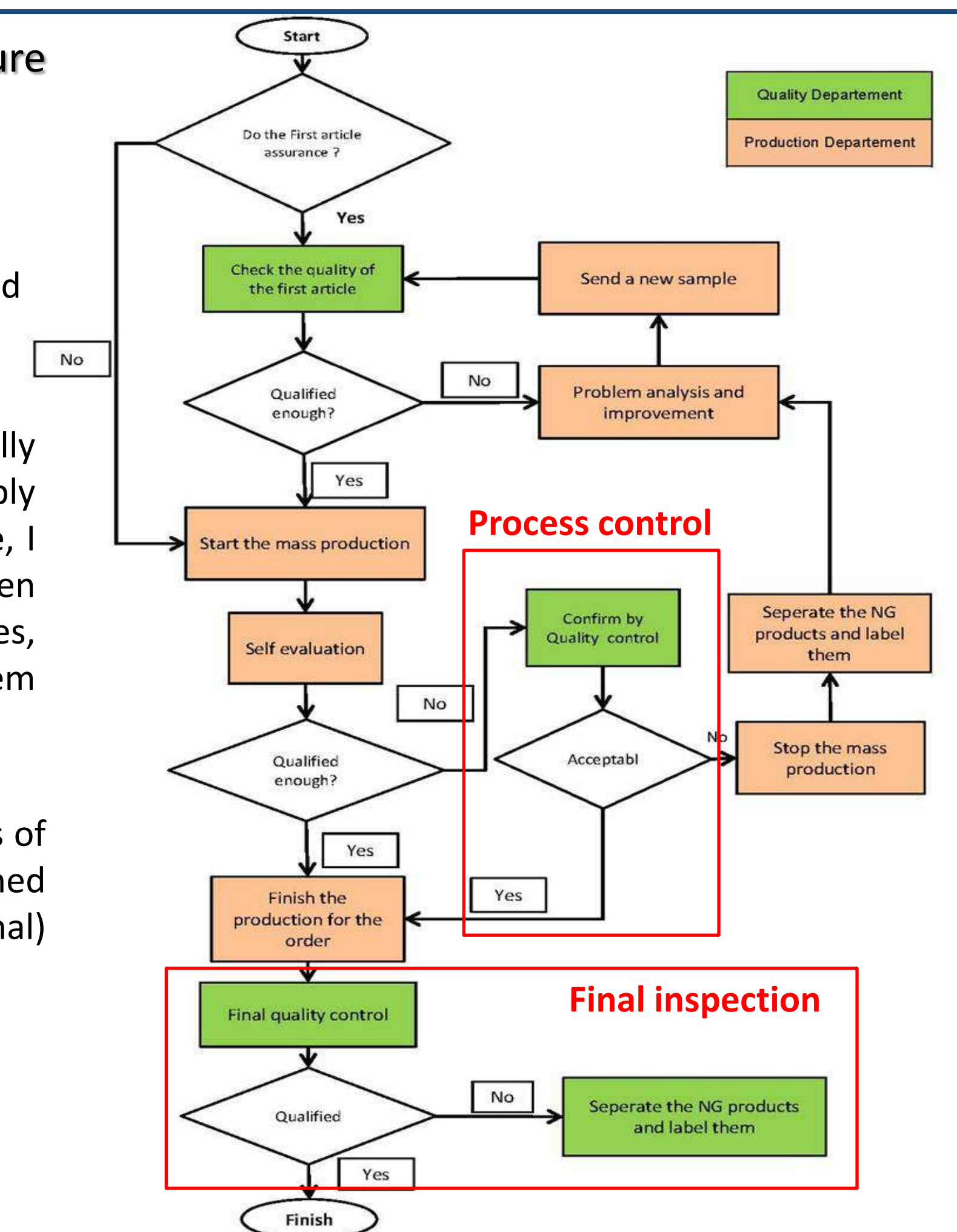
Procedure of "product quality control" is integrated in our documentation system as in the figure.

#### Process control

For the process control, my mission was specifically to solve quality problems arising on the assembly lines. Once a problem occurs on an assembly line, I need to address it as soon as possible, and then analyze it according to a series of procedures, ultimately pinpointing the source of the problem and giving a result.

#### Final quality control

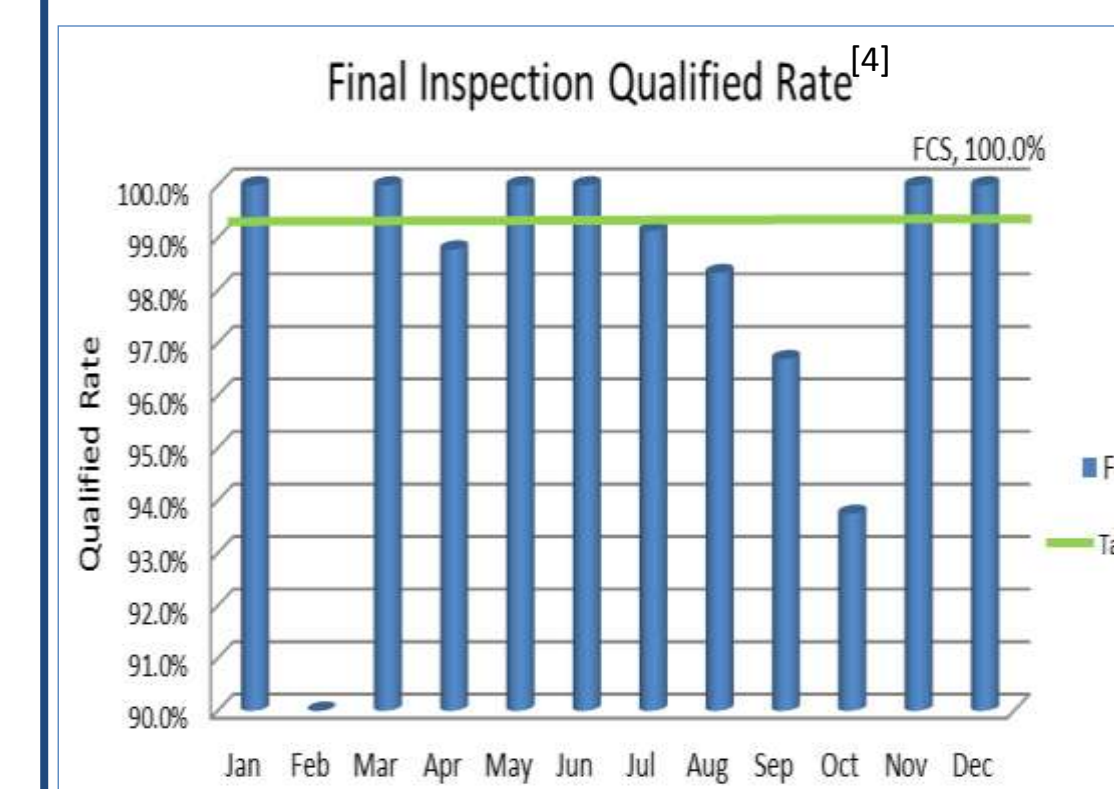
The final quality control is performed on the basis of the verification of the characteristics of the finished product (visual, functional, and dimensional) according to the **inspection sheet**.



- Check and try to understand the results, look for the root causes

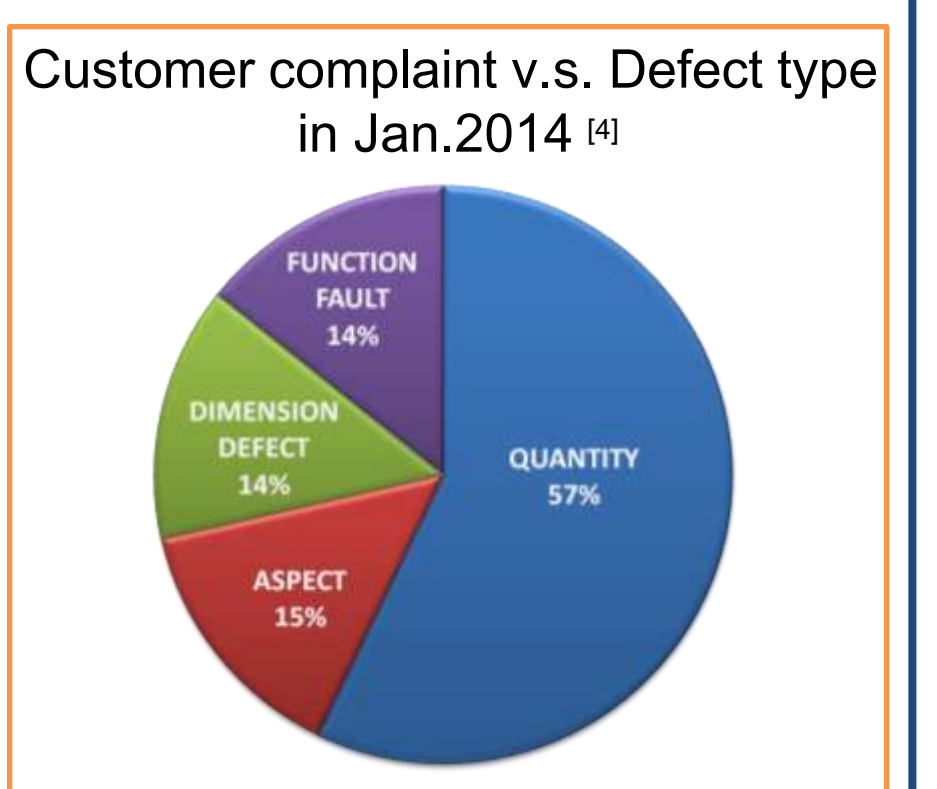
### Quality Indicators:

- ✓ Number of customer complaints and the defect type
- ✓ Final inspection qualified rate. It equals the conformity product quantity / production quantity comes from the assembly line.



From this histogram, we can see the difference between the target rate and the actual rate of every month in 2013. There are several months that we didn't reach our goals.

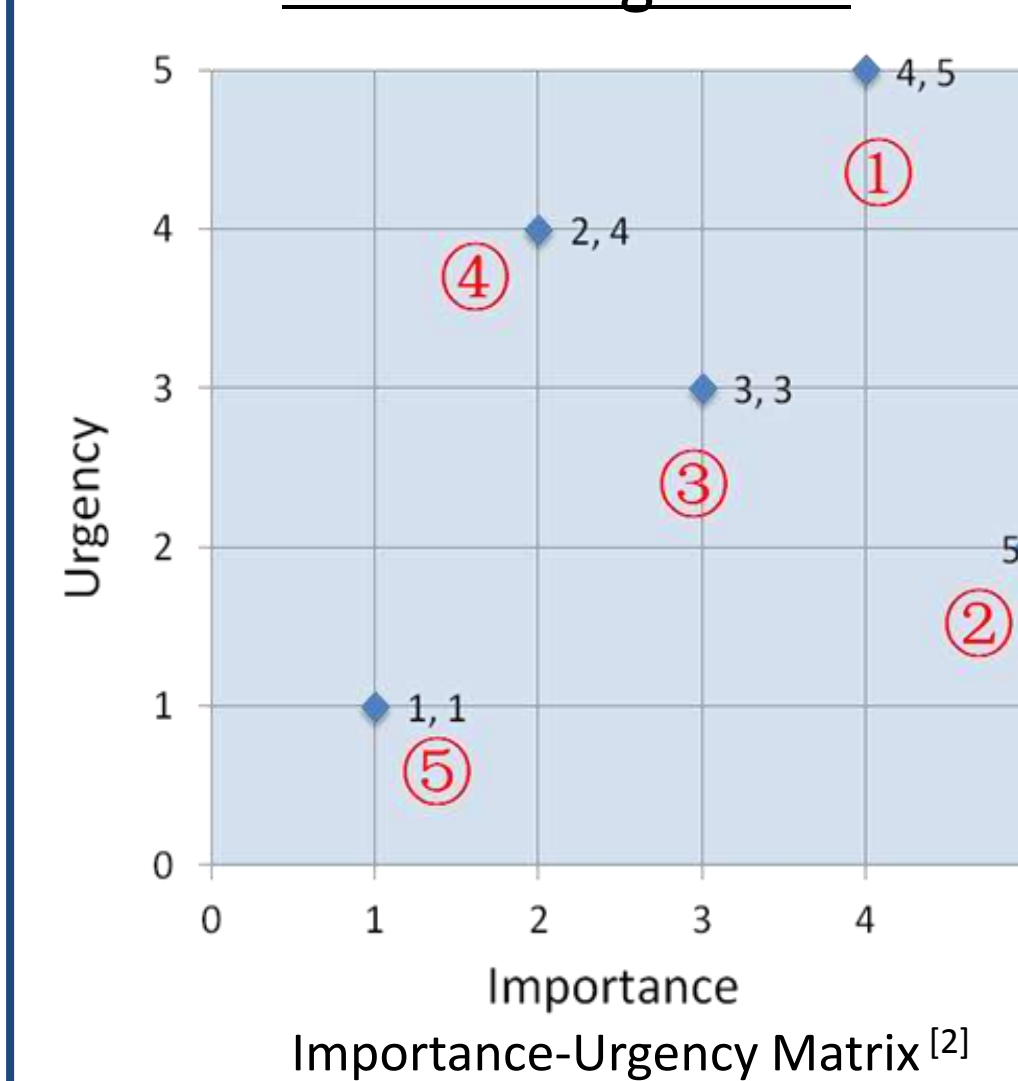
From this chart, we can see the quantity of different defects types. The predominant cause of customer complaint is the quantity problem.



These results are then analyzed, resulting in the determination of which corrective and preventive actions should be taken for the most significant factors.

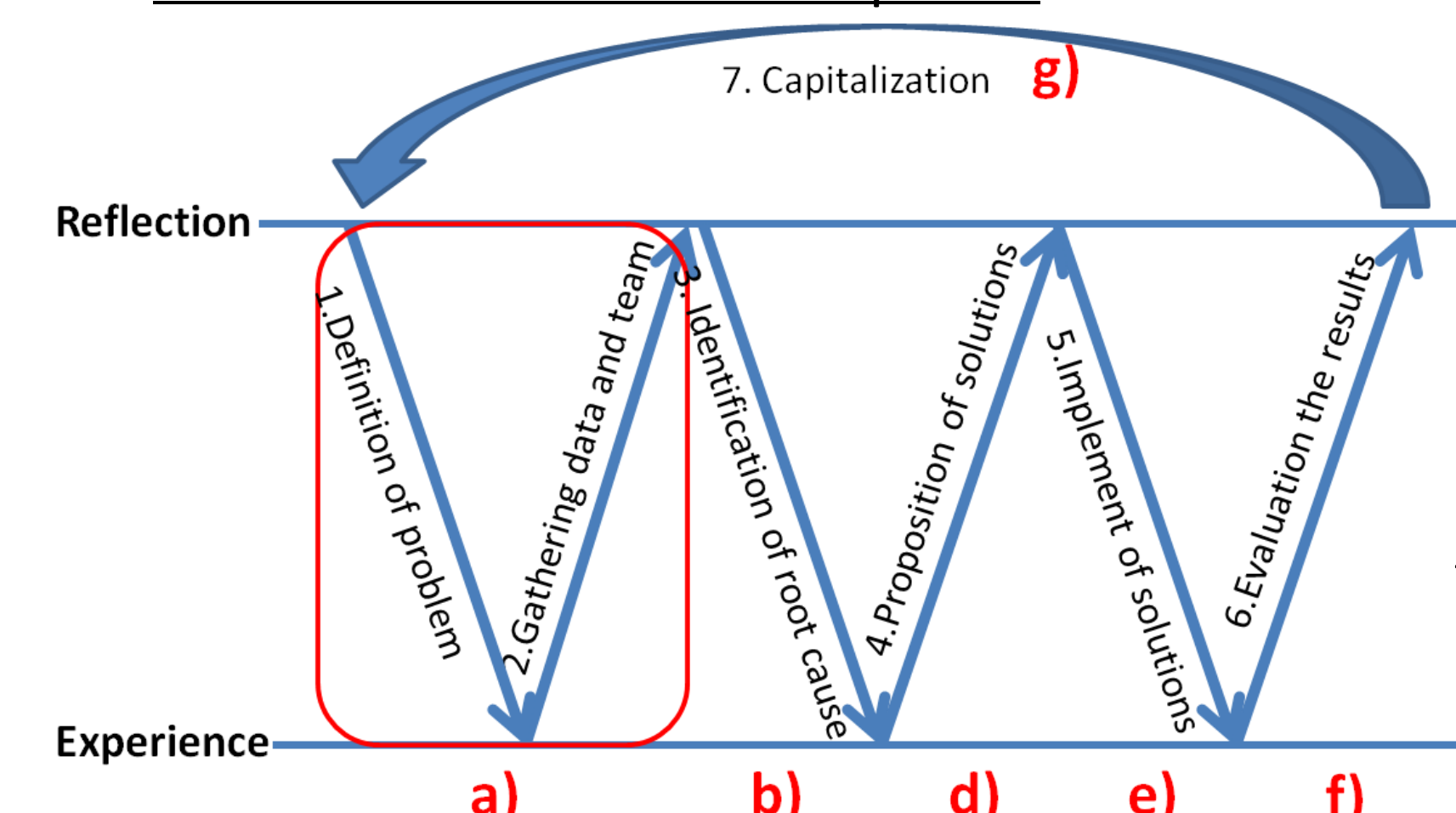
## 5. Results

### Time management



The points near the upper right corner get higher priority, which makes the mission ① > ② > ③ = ④ > ⑤. But this summing-up is just for advice. The priority is also influenced by many factors such as the importance of one particular customer for the mission ④. It's very important for the efficiency of my work.

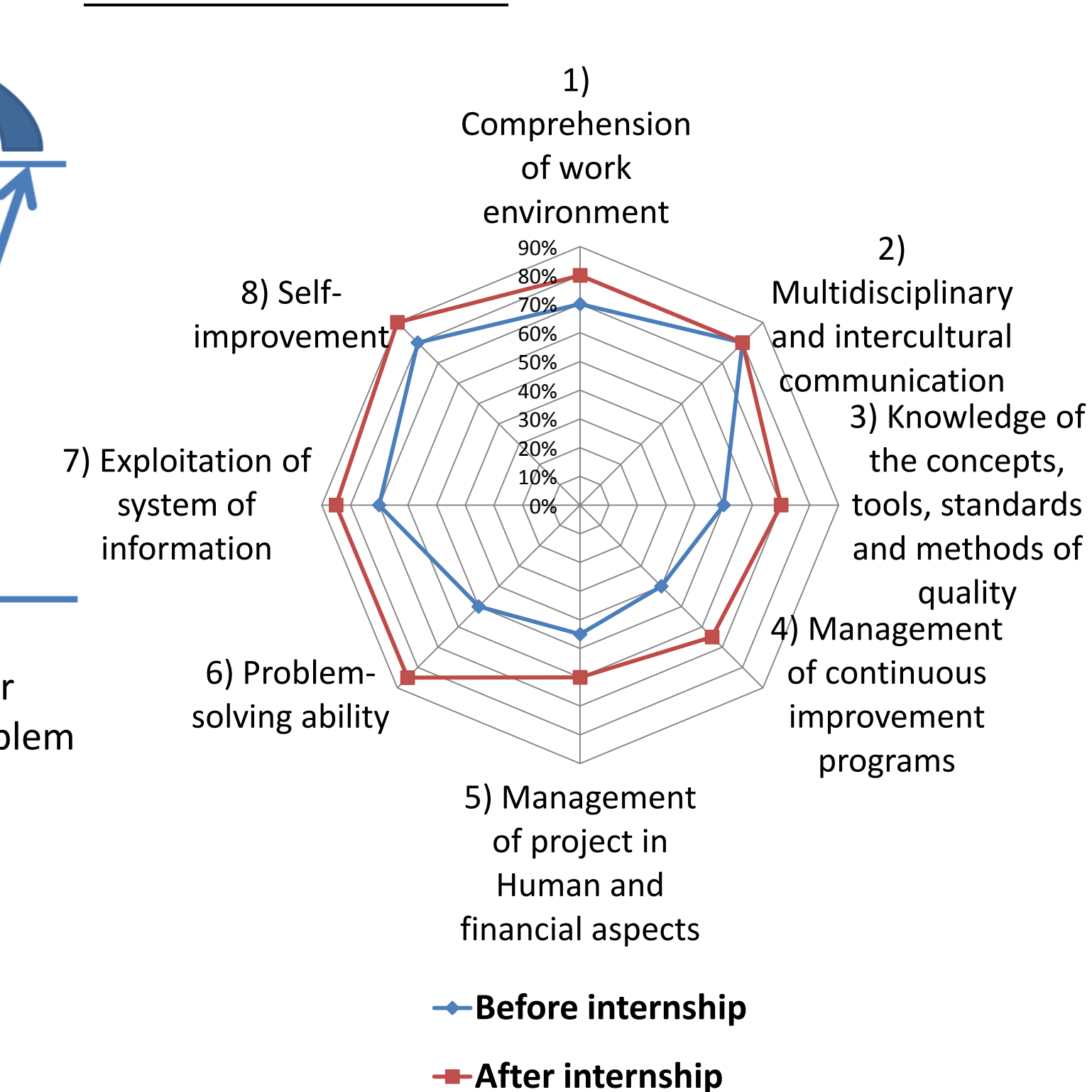
### Treatment of customer complaints



I progress the following procedure to handle the customer complaints which is well corresponded to the 7 steps problem resolution. :

- a) Receipt of complains to service quality
- b) Analysis process
- c) Transition of problem and information (optional)
- d) Proposition of solutions
- e) Implement of solutions
- f) Review of results
- g) Registration

### Personal conclusion



## 6. Bibliography

- [1] Staubli site: <http://www.staubli.com/>
- [2] ZHAO Xinyi, Université de Technologie de Compiègne, Master Qualité et Performance dans les Organisations (QPO), Mémoire d'Intelligence Méthodologique du stage professionnel de fin d'études, juin 2014, [www.utc.fr/master-qualite](http://www.utc.fr/master-qualite), puis "Travaux" "Qualité-Management", réf n° 299
- [3] U176 40 003\_C 产品过程质量控制程序
- [4] Internal document: FCS data analysis in 2013
- [5] Ronald Moen, Clifford Norman, Evolution of the PDCA Cycle, Available: <http://pkpinc.com/files/NA01MoenNormanFullpaper.pdf> [Accessed: 10-Jun-2014].
- [6] G. Farges, Ishikawa. Available: [http://www.utc.fr/~farges/gbm\\_et\\_qualite/outils/ishikawa.htm](http://www.utc.fr/~farges/gbm_et_qualite/outils/ishikawa.htm) [Accessed: 10-Jun-2014].
- Other documents:**
- [7] ISO 9001 : 2008 Système de management de la qualité, URL: <http://www.afnor.org>
- [8] Garvin, David, and Artemis March. (1981). A Note on Quality: The Views of Deming, Juran, and Crosby
- [9] U176 00 000\_D\_质量手册
- [10] U176 30 402 《不良零件回收表》