

A top-down view of three hands holding smartphones. The hand on the left has red nail polish. The hand on the right is holding a white smartphone. The background is a light-colored surface.

# The Wastes of Product Engineering

Luís Rodrigues · May 31, 2023

# **A brief history of Lean Manufacturing.**

# Toyota Production System

Ohno Taiichi and Toyoda Sakichi, 1950s

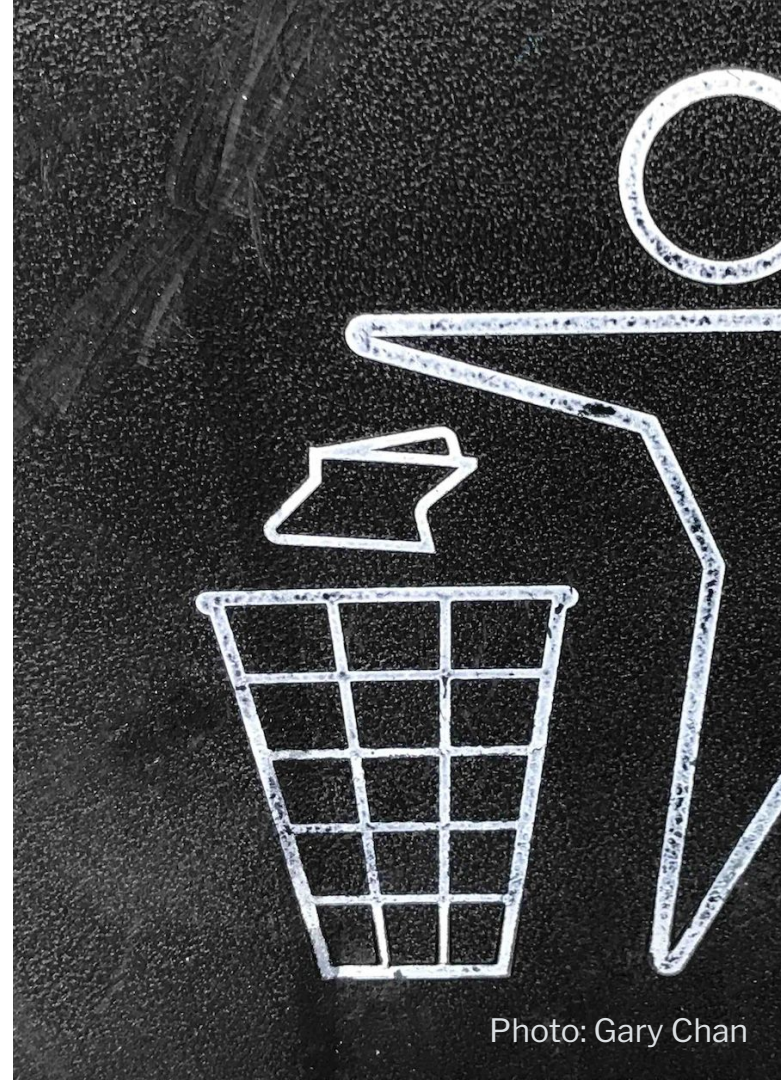
- Respect for people
- Continuous improvement · 改善 (Kaizen)
- Just-In-Time manufacturing
- Autonomation · 自動化 (Jidoka)
- Wastefulness · 無駄 (Muda)
- Inconsistency · 斑 (Mura)
- Unreasonableness · 無理 (Muri)



# The Muda of Lean Manufacturing.

# Wastes

1. Transport
2. Inventory
3. Motion
4. Waiting
5. Overproduction
6. Overprocessing
7. Defects
8. Skills



# 1. Transport

Waste from moving tools, people, equipment or products.



Source: 4gifs

## 2. Inventory

Waste from storing  
unnecessary resources.





### 3. Motion

Waste from unnecessary  
movement of people.



Source: Robert E Blackmon



## 4. Waiting

Waste from not being able  
to proceed while waiting.



Source: The Office

## 5. Overproduction

**Waste** from manufacturing something before it's needed.



## 6. Overprocessing

Waste from adding more work, features, or steps than are required.



## 7. Defects

Waste from products that are unfit for use.



## 8. Skills

Waste from unused human talent.



**Necessary waste.**

# **The Wastes of Product Engineering.**

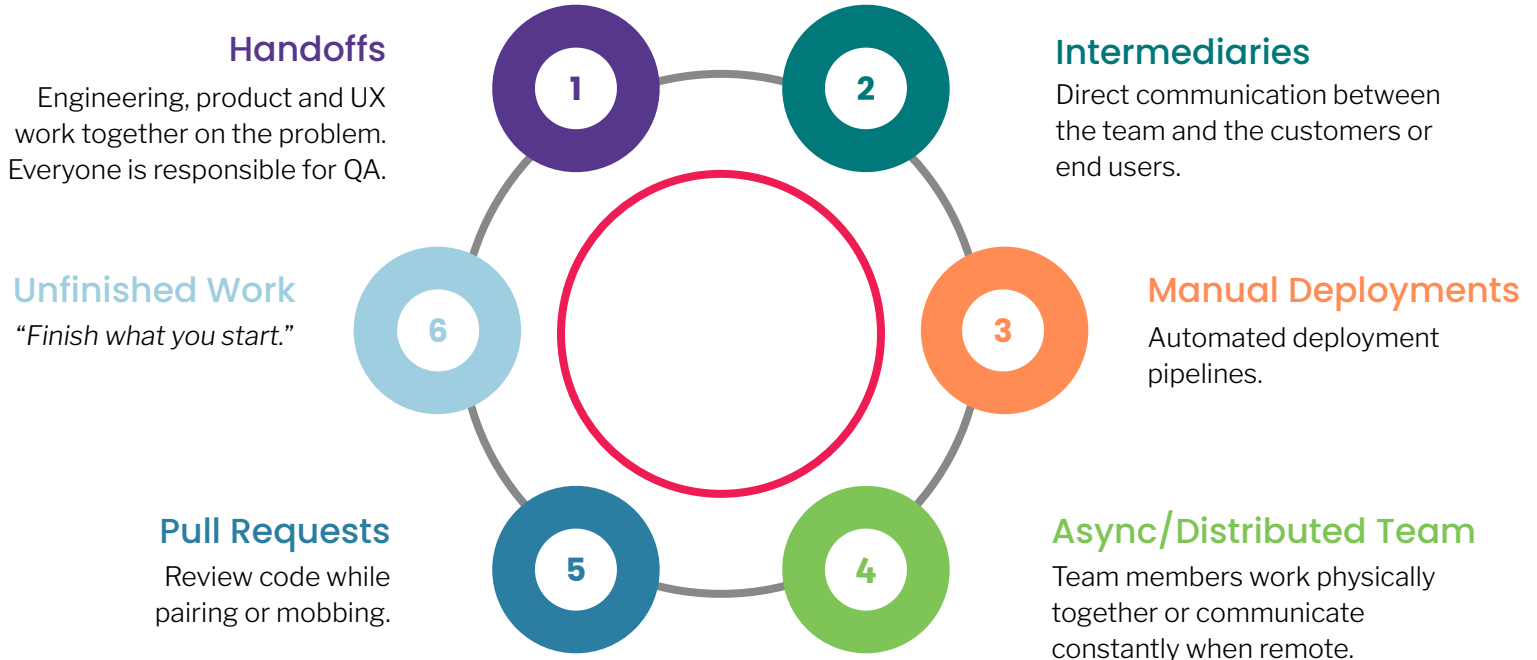


# Disclaimer

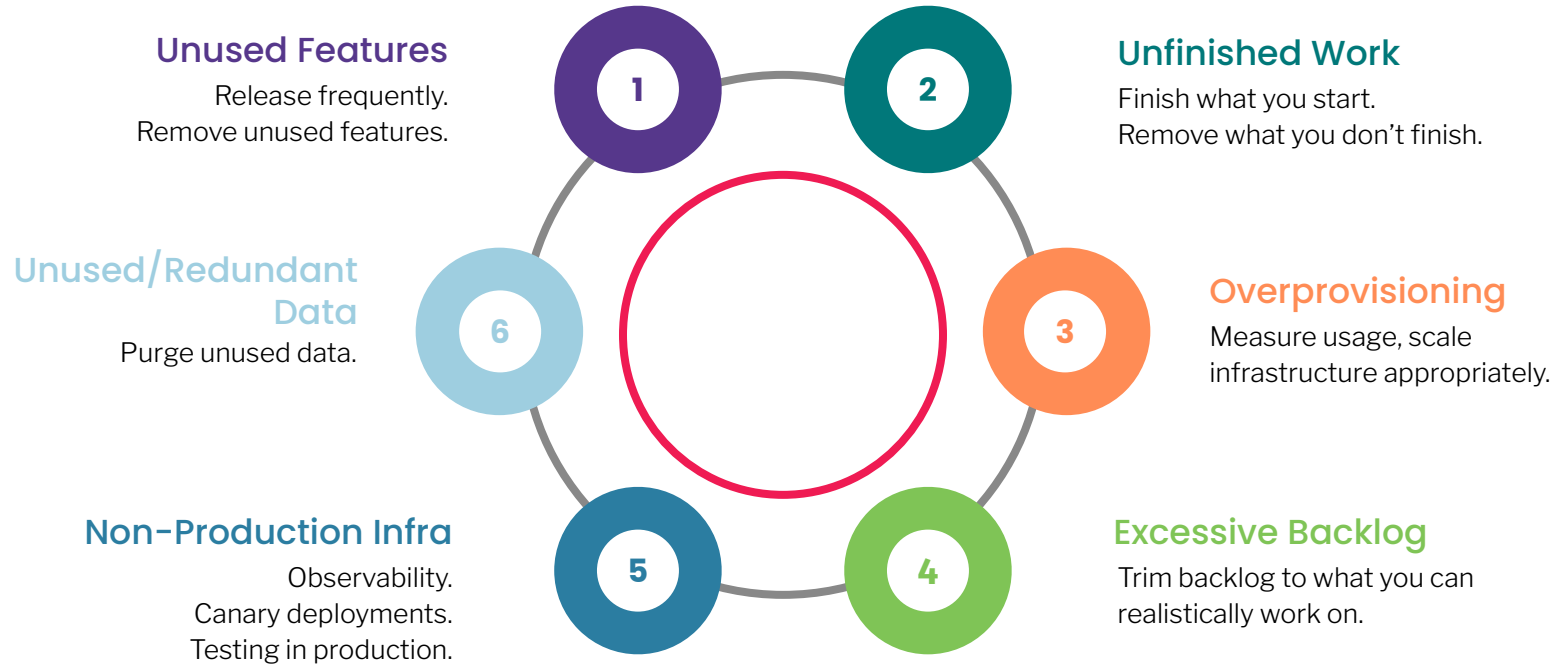
This is not an exhaustive list.

Feel free to interrupt with suggestions.

# Transport



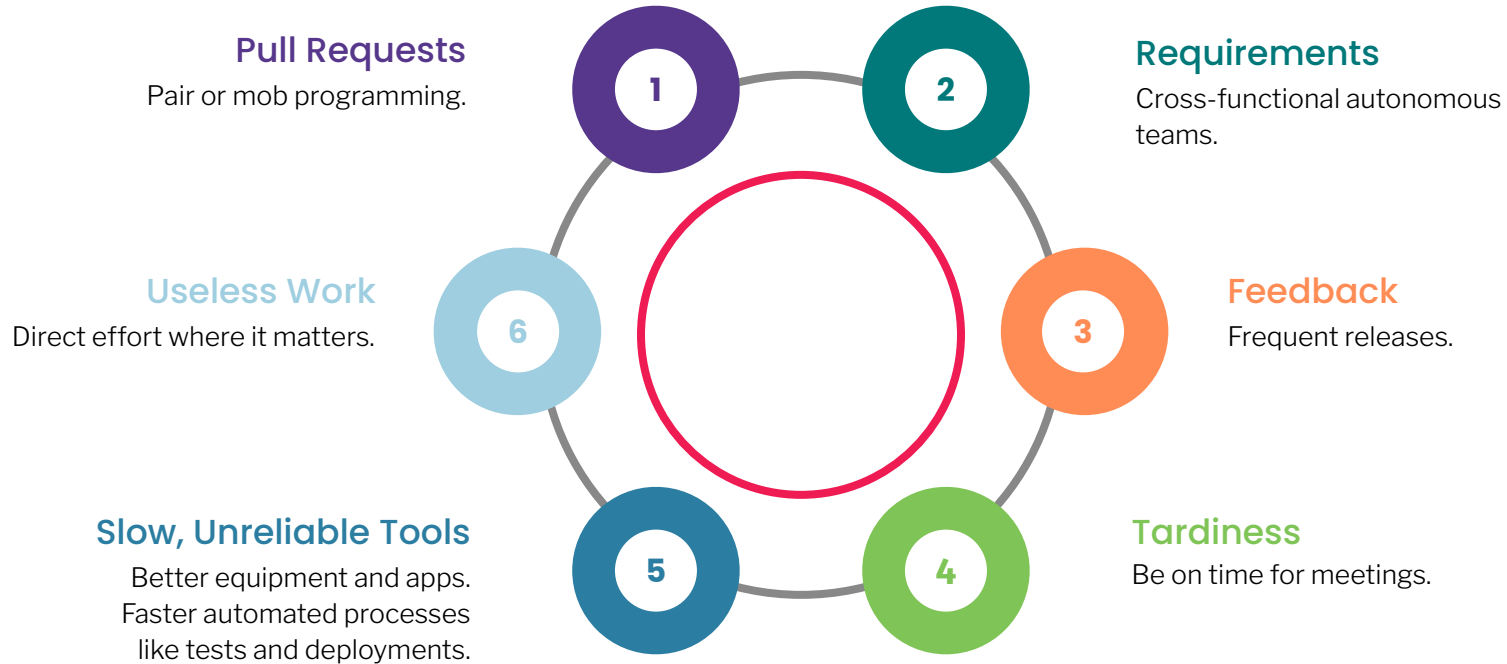
# Inventory



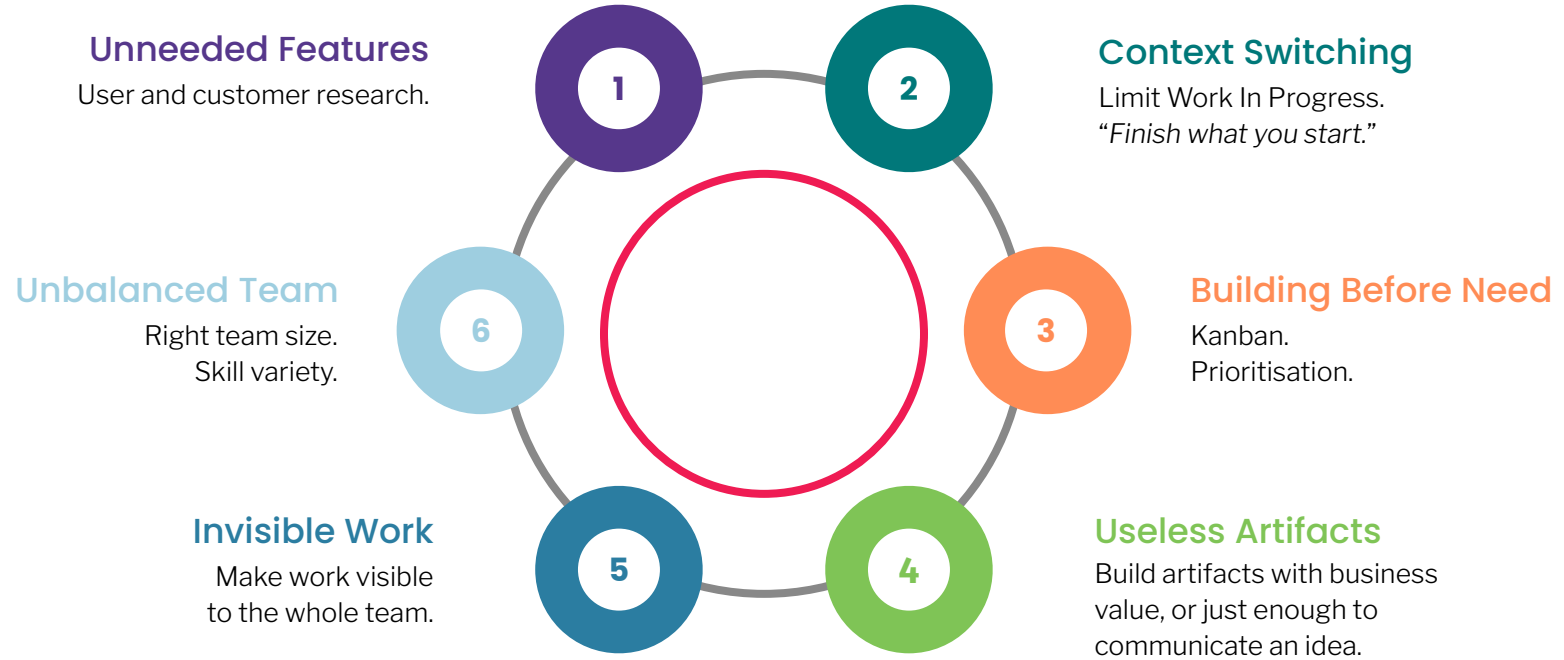
# Motion



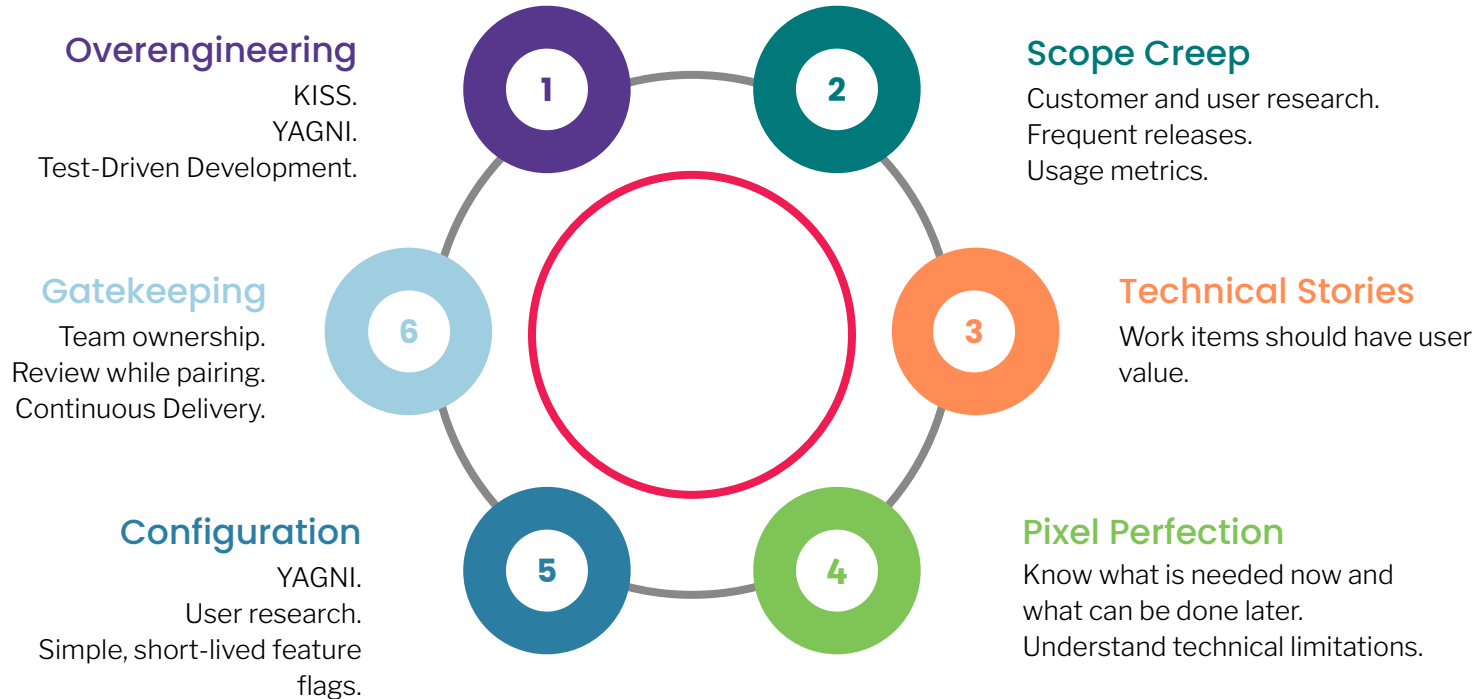
# Waiting



# Overproduction

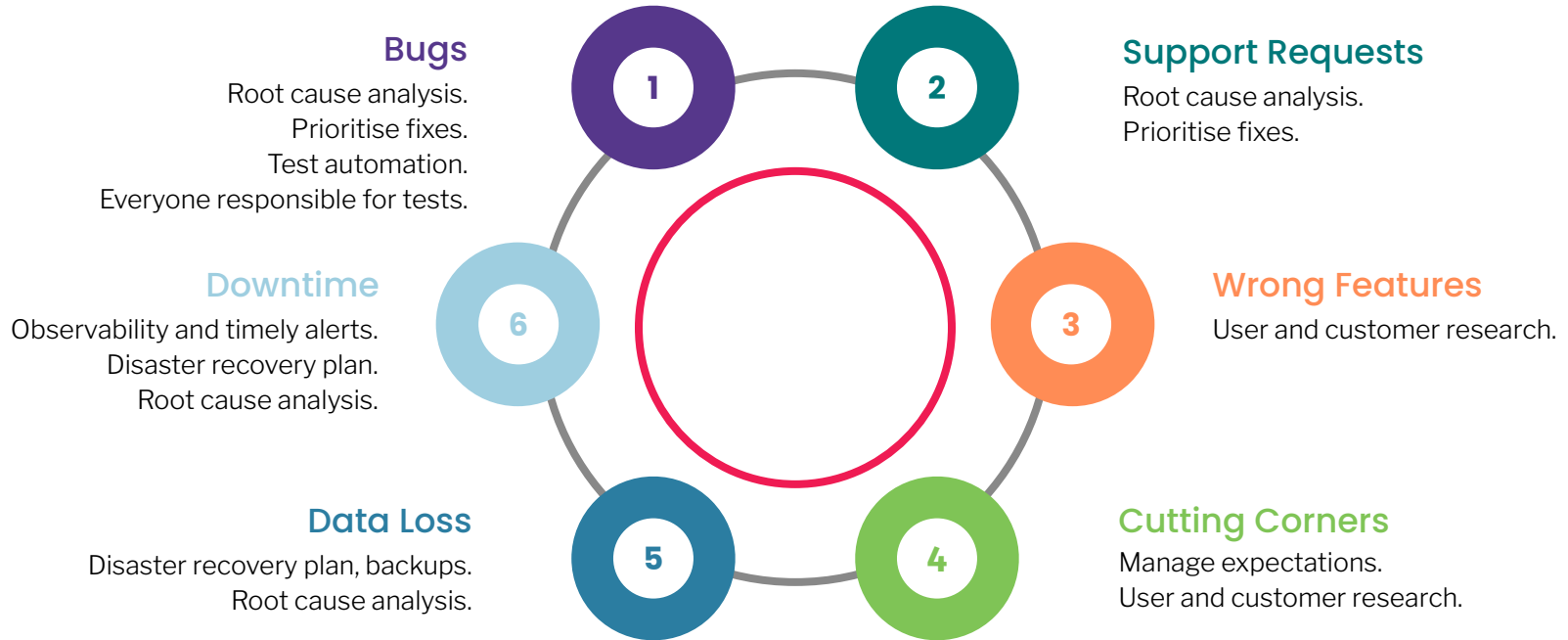


# Overprocessing

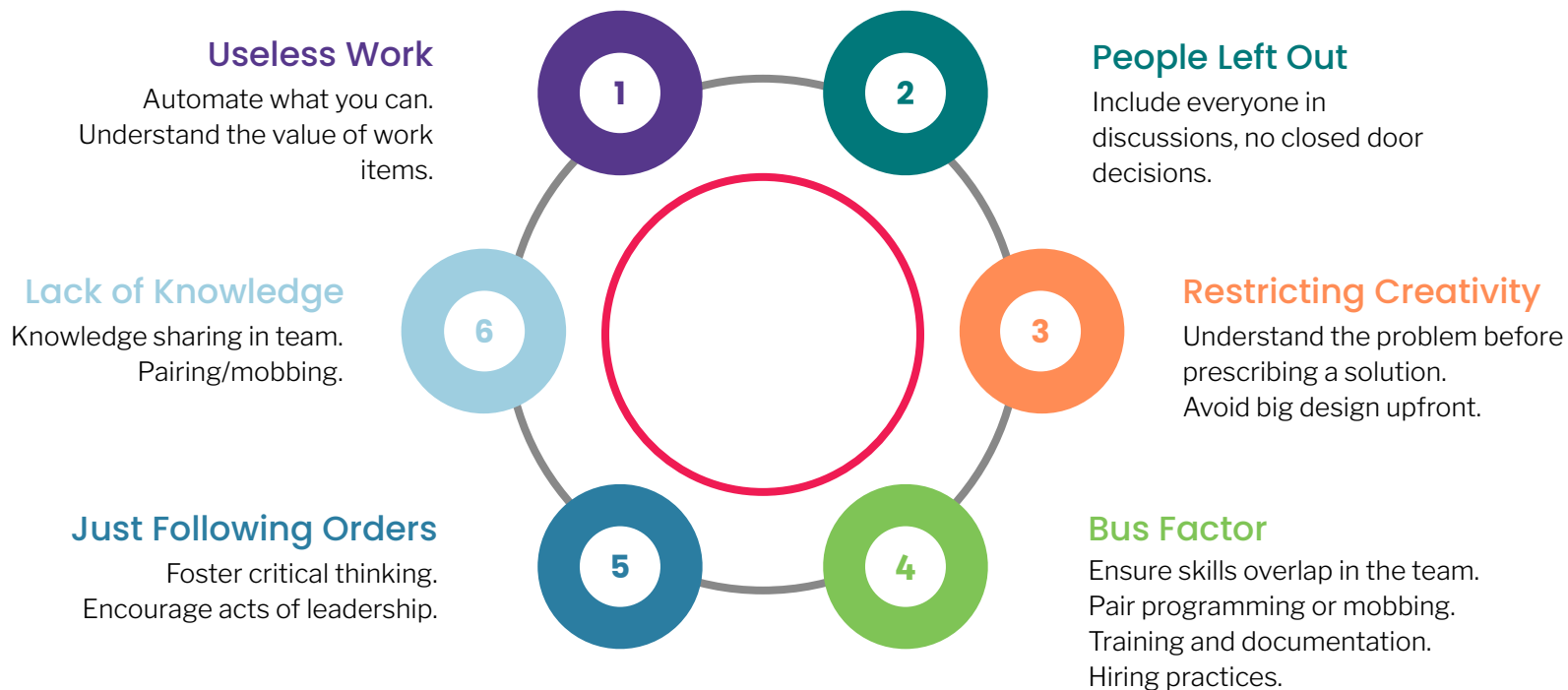




# Defects



# Skills



**Thank you.**  
**That is all.**