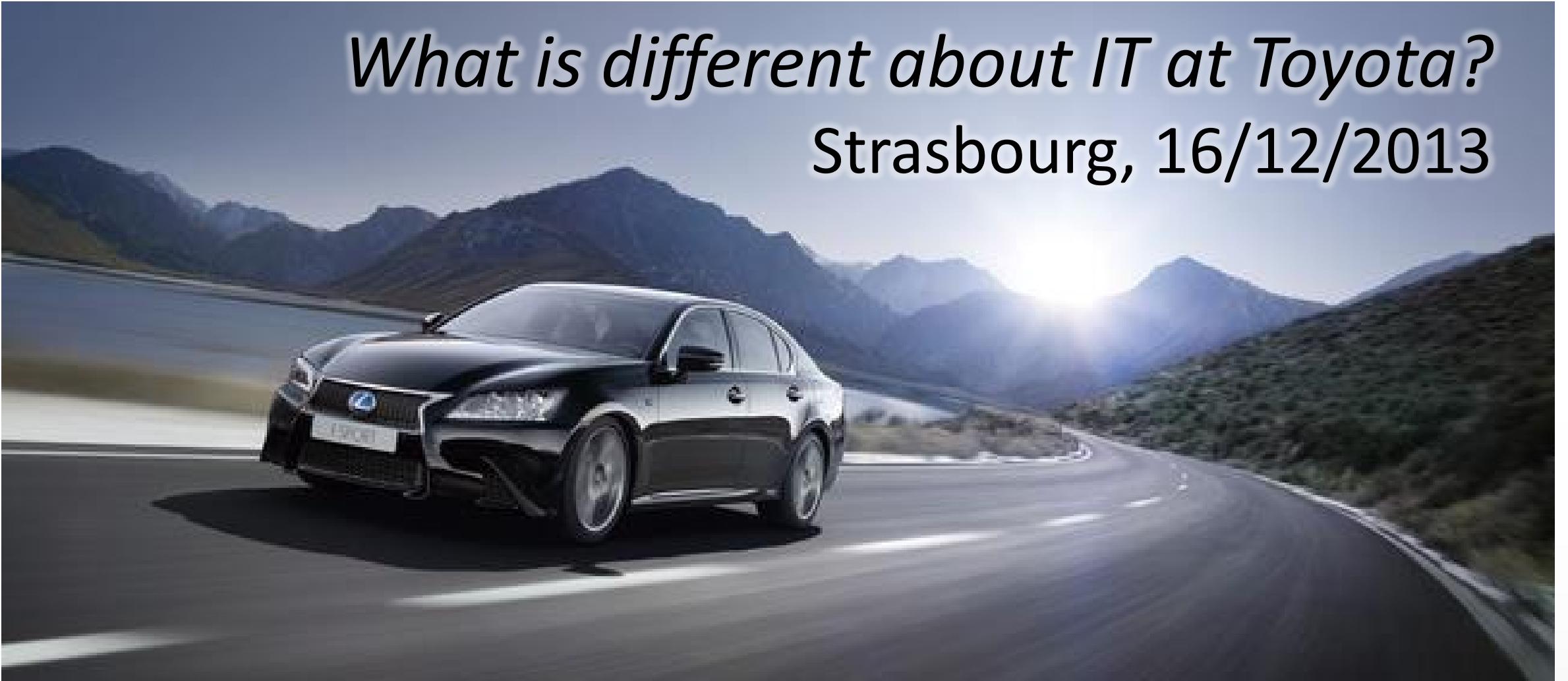# What is different about IT at Toyota?
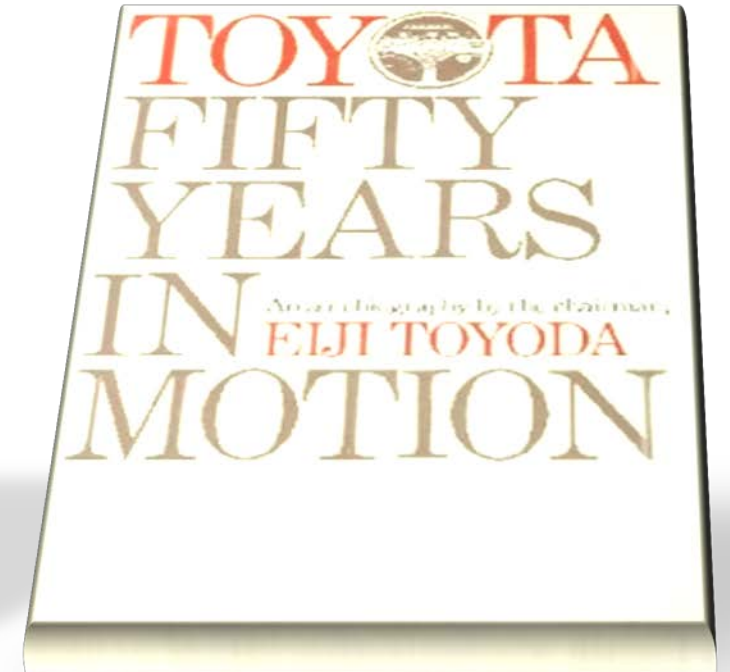## Strasbourg, 16/12/2013

Pierre Masai
CIO, Toyota Motor Europe

TOYOTA

In memoriam Eiji Toyoda

Co-creator of the Toyota Way, Architect of the expansion of Toyota outside Japan; behind the Corolla, Lexus brand and Prius project, a giant of the Automotive Industry: Sadly missed.

TOYOTA

Agenda

Brief Introduction to Toyota Motor Europe

- How Toyota Motor Europe fits into the Global Toyota Family

Focus on Concepts

- A look at some key Toyota Principles, explaining their meaning, origins and reflecting on the Japanese Characters

What is different about IT at Toyota?

- Five themes which shed light on how Toyota Europe Information Systems might be different from many lean and non lean IS Divisions.

TOYOTA

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TOYOTA

Toyota in the world

- **Established in 1937**

- **77 manufacturing companies in 27 countries**

- **Vehicles sold in > 170 countries worldwide**

- **Over 9.75 million vehicles sold worldwide in 2012**

- **Market share: 48.6% in Japan (2012), 14.4% in US (2012), 4.5% in Europe (2012)**

- **Over 5.5 million cumulative hybrid sales (2013)**

- **€206 billion net revenue in FY 2012-13**

- **€12 billion operating income**

- **Approx. 318,000 employees worldwide**

TOYOTA

Regional headquarters

Toyota Motor Europe NV/SA (TME)

Toyota Motor Corporation (TMC)
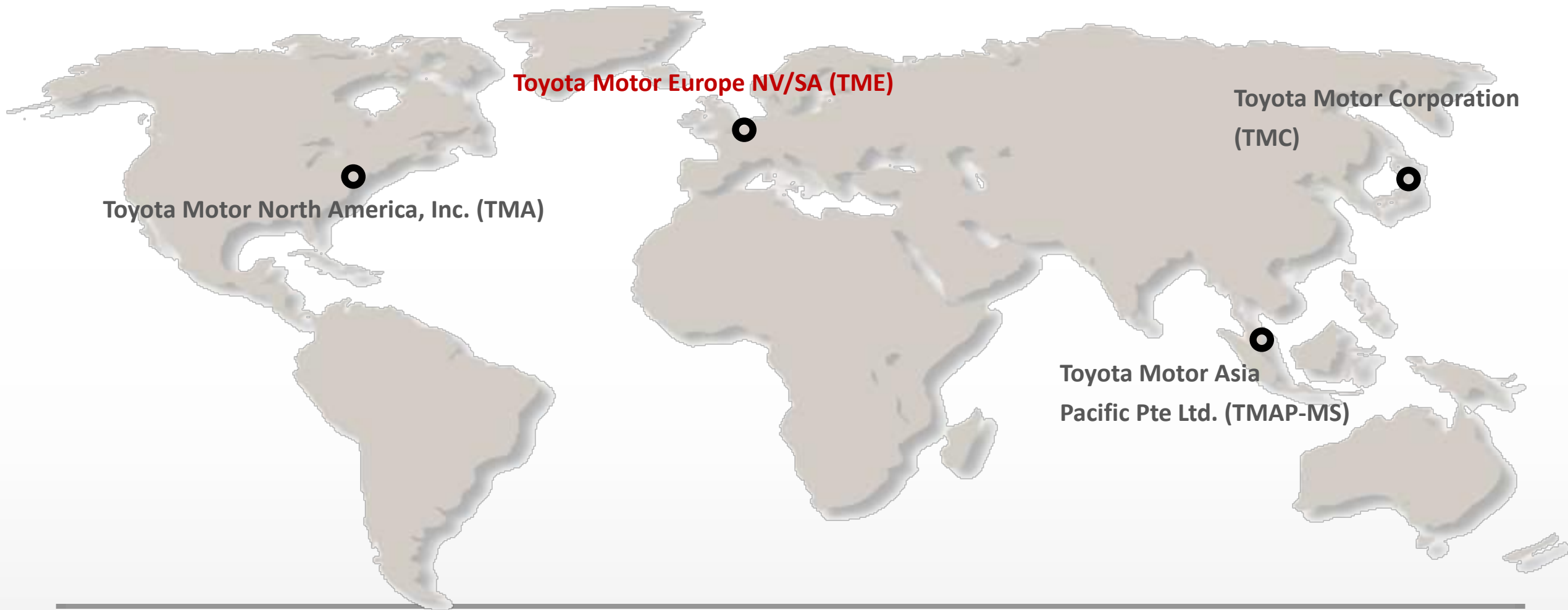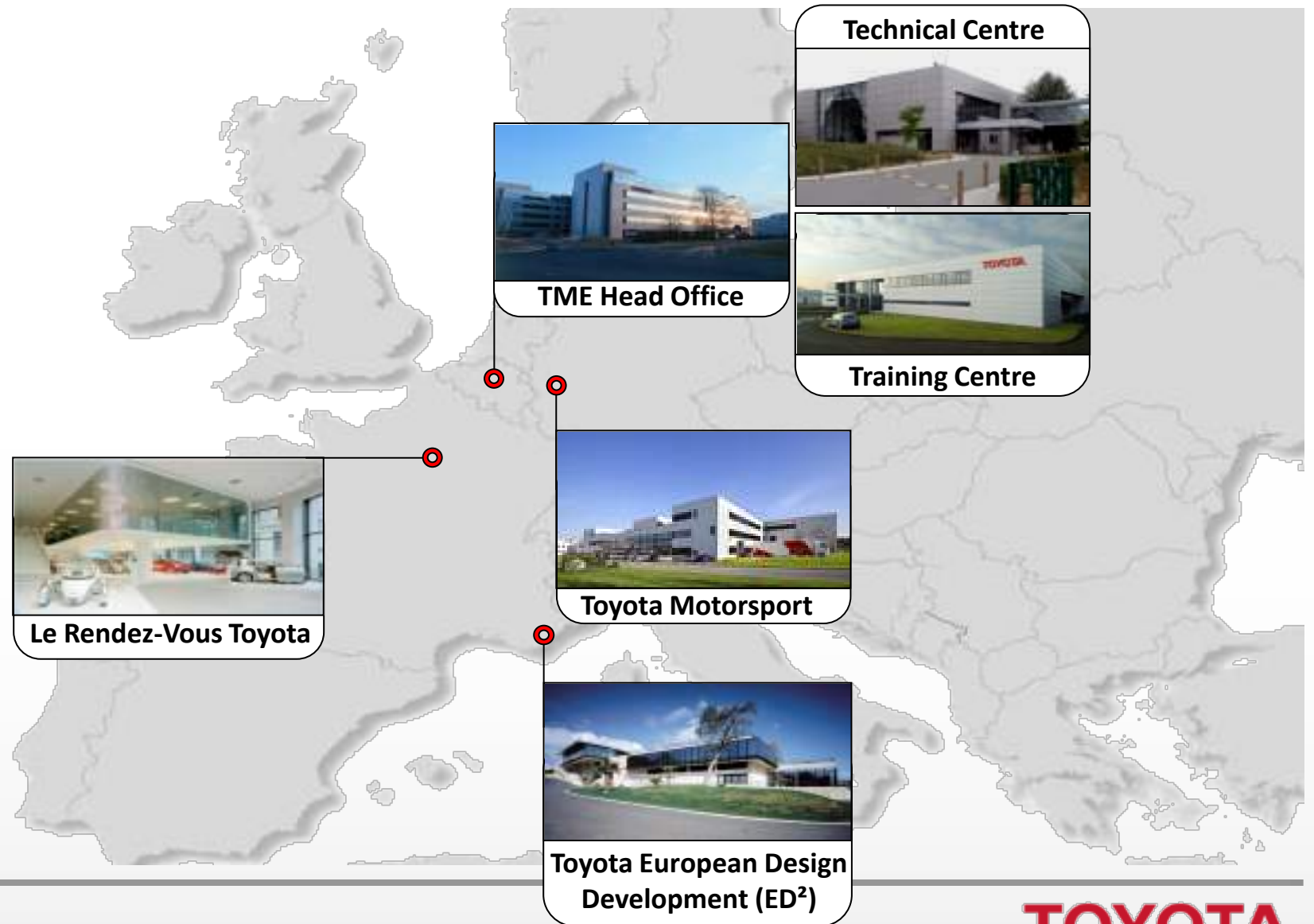
Toyota Motor North America, Inc. (TMA)

Toyota Motor Asia Pacific Pte Ltd. (TMAP-MS)

TOYOTA

Toyota in Europe

- **Began selling cars in 1963**

- **9 manufacturing plants in 7 countries**

- **Over €8 billion invested since 1990**

- **837,969 Toyota and Lexus vehicles sold by Toyota Motor Europe in 2012**

- **More than 500,000 hybrids sold in Europe to date**

- **4.5 % market share in 2012**

- **Employees (approx.): 93,400 (including distribution network) / 20,000 (direct)**

TOYOTA

Facilities

Technical Centre

TME Head Office

Training Centre

Le Rendez-Vous Toyota

Toyota Motorsport

Toyota European Design Development (ED²)

TOYOTA

Manufacturing Sites

TMUK - Engines

TMUK – Auris, Auris hybrid & Avensis

TMIP – Diesel engines

TMMR - Camry

TMMF - Yaris

TPCA - Aygo

TMMP - Engines & Transmissions

Toyota Caetano – Dyna

TMMT – Verso, Corolla

TOYOTA

Vehicles

Over 2/3 of our vehicles sold in Europe are made in Europe:
- **Toyota Aygo**
- **Toyota Yaris**
- **Toyota Yaris hybrid**
- **Toyota Auris**
- **Toyota Auris hybrid**
- **Toyota Corolla**
- **Toyota Verso**
- **Toyota Avensis**
- **Toyota Camry**
- **Toyota Dyna**
- **Toyota ProAce**

TOYOTA

Logistics Companies

14 Parts Logistics Centres
11 Vehicle Logistics Centres

Zeebrugge
Vehicle Centre

Toyota Parts
Centre Europe
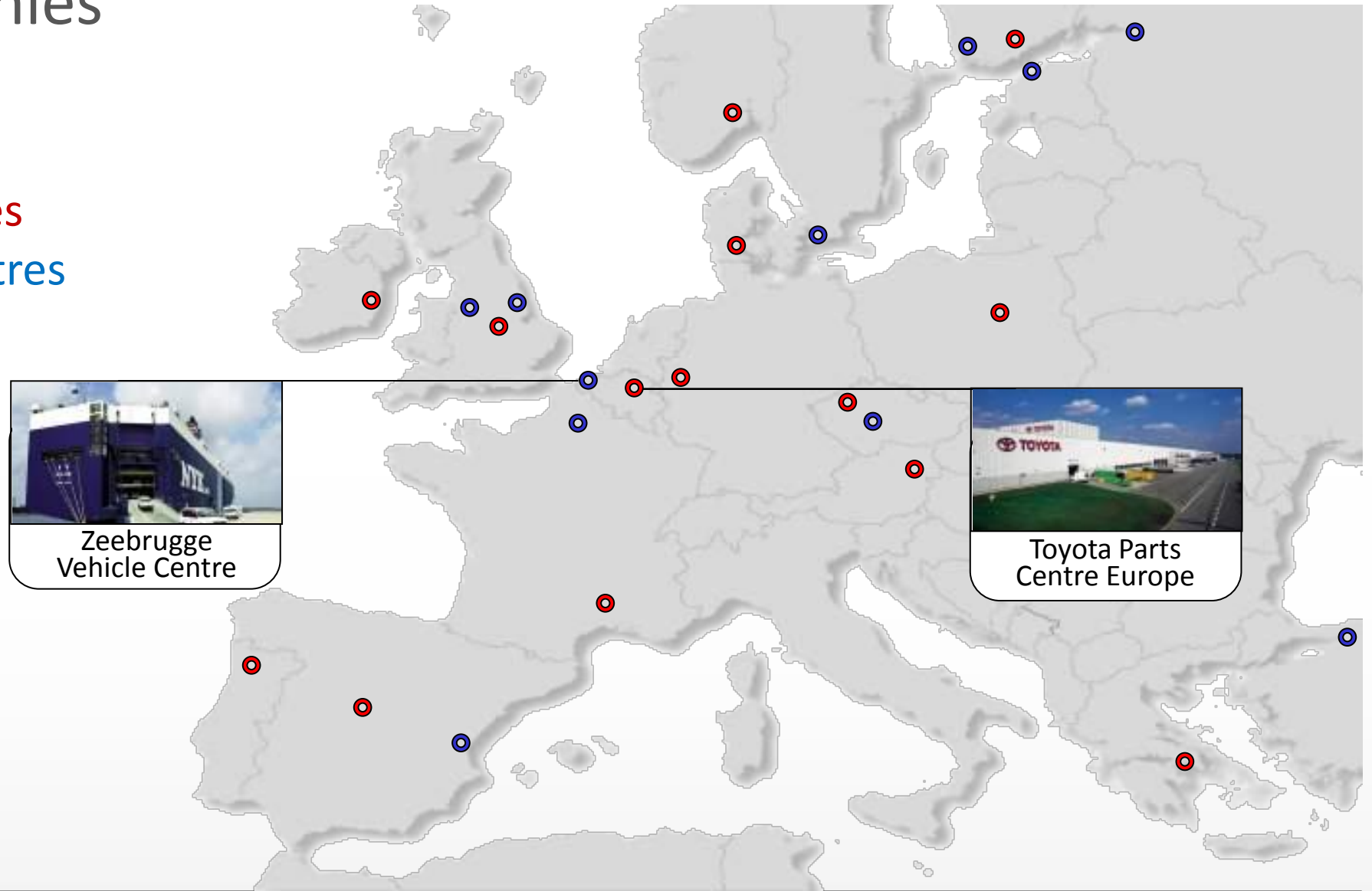
TOYOTA

National Marketing and Sales Companies

- **30 NMSCs**

- **56 Countries**

- **275 Lexus retailers**

- **2,858 Toyota retailers**

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Focus on Concepts

- In this section, we'll introduce a few TPS concepts, their background and what they mean for IS.

- These are examples from a 'dictionary' that I am developing.

- The main take away point is that most concepts from TPS can be used successfully in IS.

TOYOTA

Focus on Concepts - Jidoka

- **Literal meaning**:
  JI = self – DO = move – KA = change

- **Meaning:** Automation with a human touch. It is a fundamental pillar of TPS, next to Just in Time (ジャストインタイム).

- **Origin:** The automatic loom of Sakichi Toyoda that stopped by itself in case of a defect.

- **Example applied to IS:**
  A program stopping automatically and requesting an intervention when a major error occurs to prevent defect flow out.

自働化

TOYOTA

Focus on Concepts - Gentani

- **Literal meaning**:
  GEN=primitive, TAN=simple, I= rank

- **Meaning**: Basic KPI

- **Origin**: Productivity measurement in factories

- **Example applied to IS:**
  Basic KPIs are key to understand the current situation, compare to others (benchmark), improve and visualise the improvement. The cost of e-mail per user per month is a Gentani, or the number of man-days to deliver one Function Point.

原単位

TOYOTA

Focus on Concepts - Mieruka

- **Literal meaning**:
  MIERU = be seen, KA = -ization

- **Meaning**: Visualization

- **Origin**: Visual control in the plants

- **Example applied to IS:**
  Visualisation of the progress in a phase of a project, by showing the number of items to be delivered by day until the end of the phase, and the current progress. This requires both simplicity and discipline, and is a critical factor to ensure keeping committments and improvement

見える化

TOYOTA

Focus on Concepts – Poka-Yoke

- **Literal meaning**:
  Poka = error, Yoke = protection

- **Meaning**: Fool proof or fail safe device

- **Origin**: Device to prevent the worker from picking the wrong part, or making sure a tool can only accept the correct part to be fitted.

- **Example applied to IS:**
  The computer is 'un cretino que fa presto', so is often useful to stop it before thousands of next operations are performed that are very difficult to undo.
  Other example: Check-digit for bank account

ポカヨケ

TOYOTA

Focus on Concepts - Andon

- **Literal meaning**:
  An = to go, DON = lamp

- **Meaning**: Ancient paper lantern, now used as is 'andon board', visualisation of the production, or 'andon cord' to enable a worker to stop the line in case of defect.

- **Origin**: The automatic loom.

- **Example of application to IS**: Management board (display screen) with the defects that occured and their resolution status.

行灯

TOYOTA

Focus on Concepts - Heijunka

- **Literal meaning**:
  HEI=level, JUN=conform to, KA=change

- **Meaning**: Levelling (change to conform to a flat level).

- **Origin**: Need at the origins of Toyota to adapt the production to scarce resources that could not fluctuate easily.

- **Example applied to IS:**
  Ensure the amount of work that comes to a team is levelled over time to avoid having to change the size of the team or getting poor quality output.

平準化

TOYOTA

Focus on Concepts – Muri, Mura, Muda

- **Literal meaning**:
  MU=not, RI=reason,DA=horse load
  MURA=unevenness

- **Meaning**: Overburden, Unevenness, Waste.

- **Origin**: Systematic elimination of waste in the factories (7 forms of waste). Levelling of production based on scarce parts/resources

- **Example applied to IS:**
  Overburden and unevenness create quality problems. Separation of flow between urgent, one off orders and repetitive, predictible flow. Organizing work between IT departments.

無理

斑

無駄

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Agenda

Brief Introduction to Toyota Motor Europe
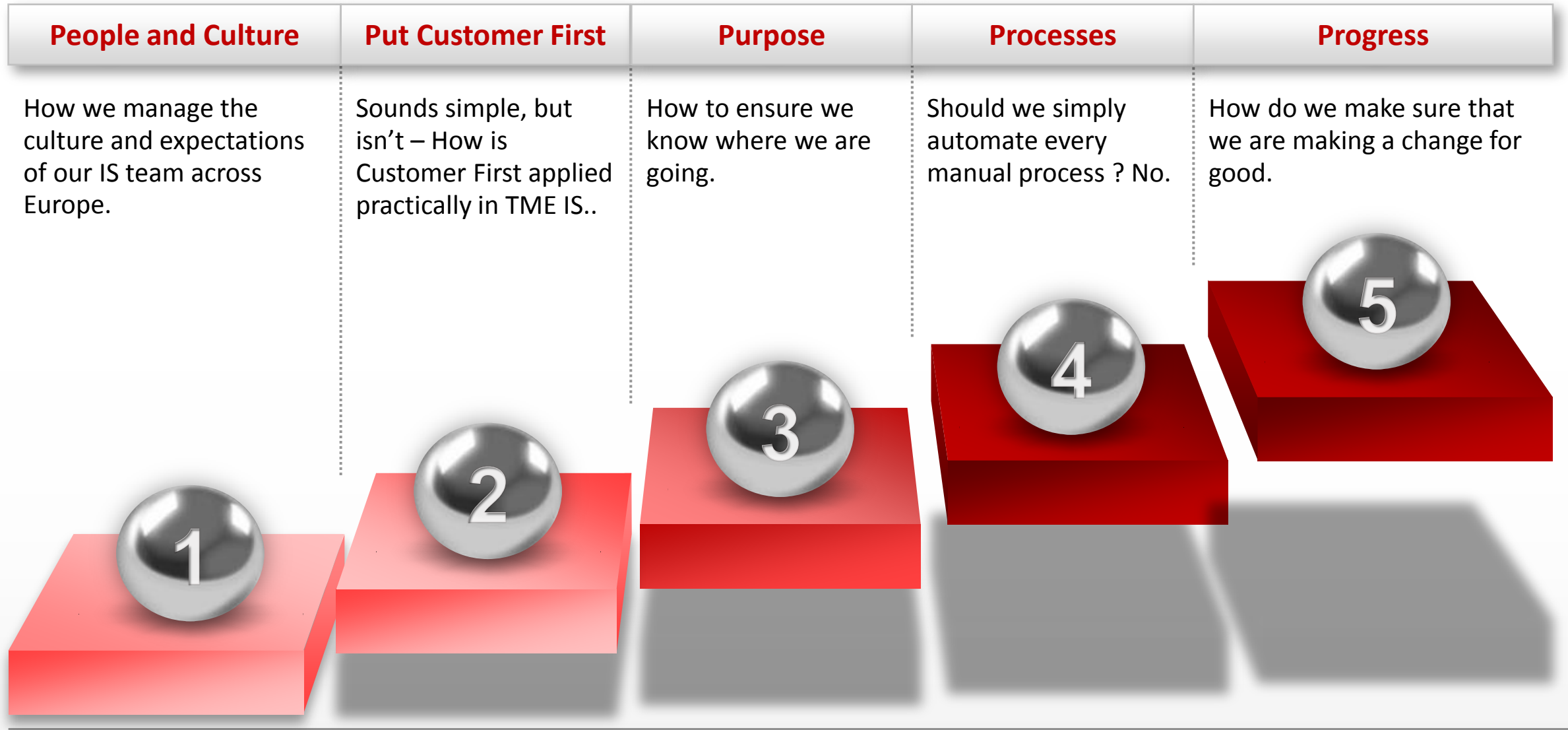- How Toyota Motor Europe fits into the Global Toyota Family

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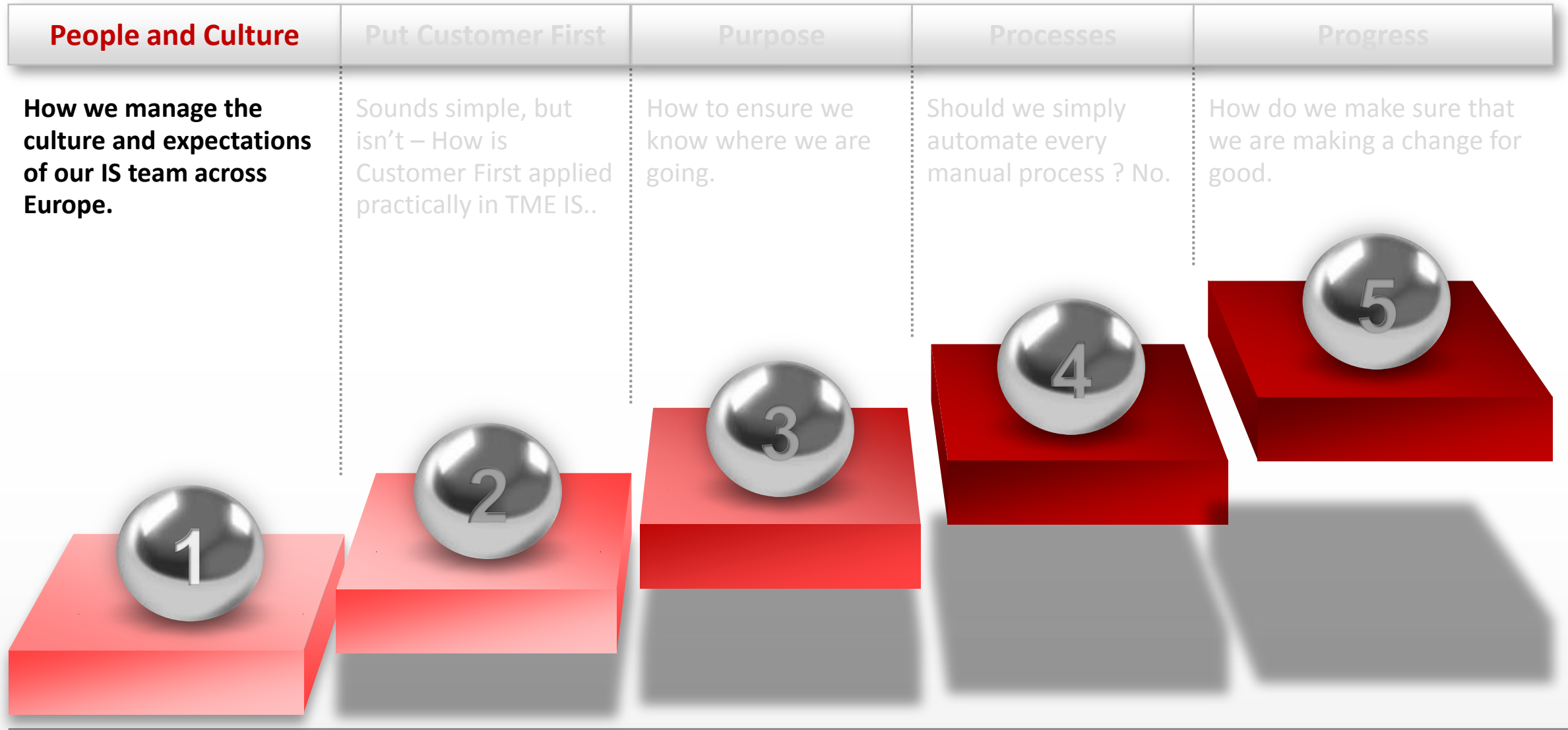
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Why is Toyota IS different ?

People and Culture	Put Customer First	Purpose	Processes	Progress
How we manage the culture and expectations of our IS team across Europe.	Sounds simple, but isn't – How is Customer First applied practically in TME IS..	How to ensure we know where we are going.	Should we simply automate every manual process ? No.	How do we make sure that we are making a change for good.

1　　2　　3　　4　　5

TOYOTA

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People and Culture

How do our People and Culture contribute to our IS Activity.

- How implementing a Toyota Way culture is different from using Lean Tools and performing one–off activity.

- How we engage our customers and our suppliers in our process

- How we use every opportunity to share learning within the company.

- How we aim to be open to other's new ideas, tools and techniques; as long as they are addressing relevant problems.

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Toyota Way Culture

Aiming for a Virtuous Circle

Develop People
- Managers coach their staff to develop their skills
- Using the entire management chain to support this continuous development.

Challenge
- We challenge our staff to make improvements in their own area
- Problem solving always starts with a thorough knowledge of the current situation.

Customer Focus
- Everyone's role is to fully play their part to support our company goals.
- Everything we do must add value and all our staff understand this clearly.
- Nobody lacks interest in our business aims and objectives.

Daily Cycle
- We regard this learning, challenging process as part of our daily work.
- We look for every opportunity to improve ourselves as individuals, as a team and a company.
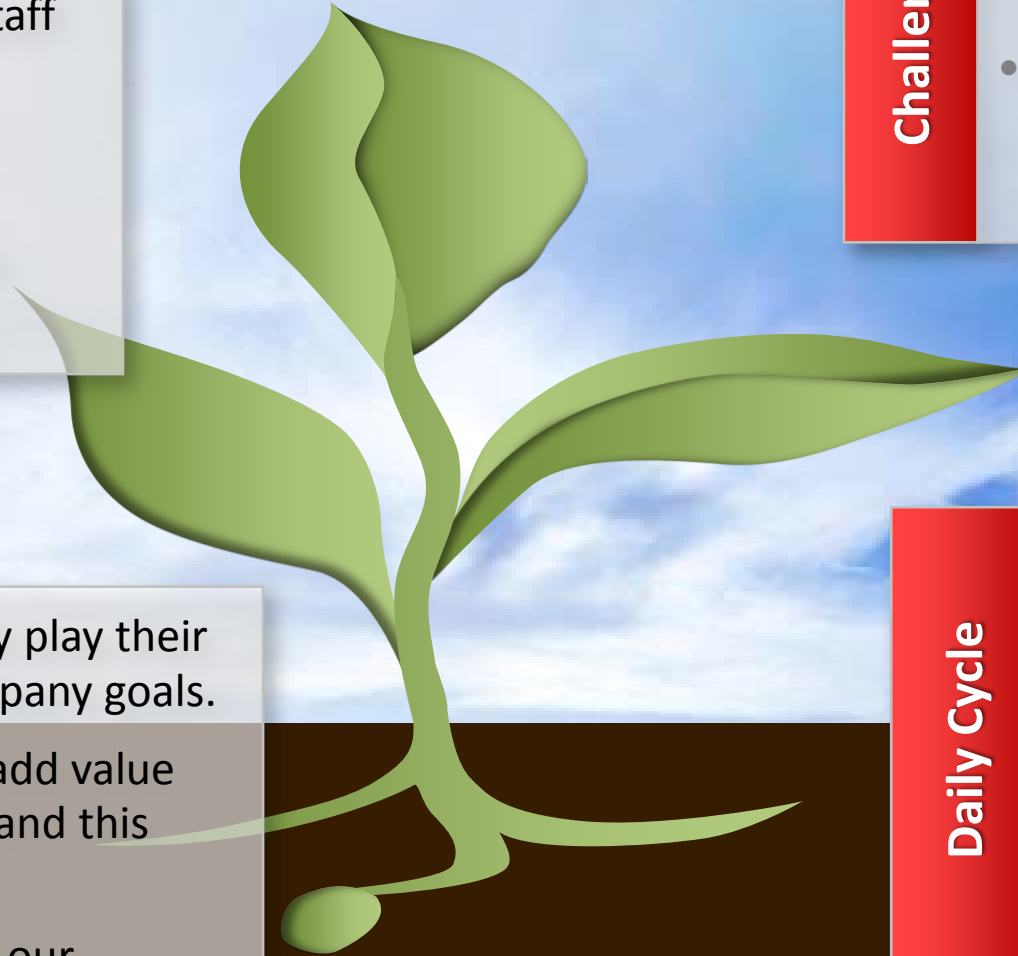
Supplier Engagement

Improvement through our relationships and working style.

- A long term mutual relationship is of primary importance when selecting a supplier ...

- .. rather than focussing on quick negotiation gains.

- To do that we seek suppliers who can;
  - Learn from their mistakes,
  - Share them openly,
  - Accept coaching and
  - Eventually improve by themselves in a self reliant way
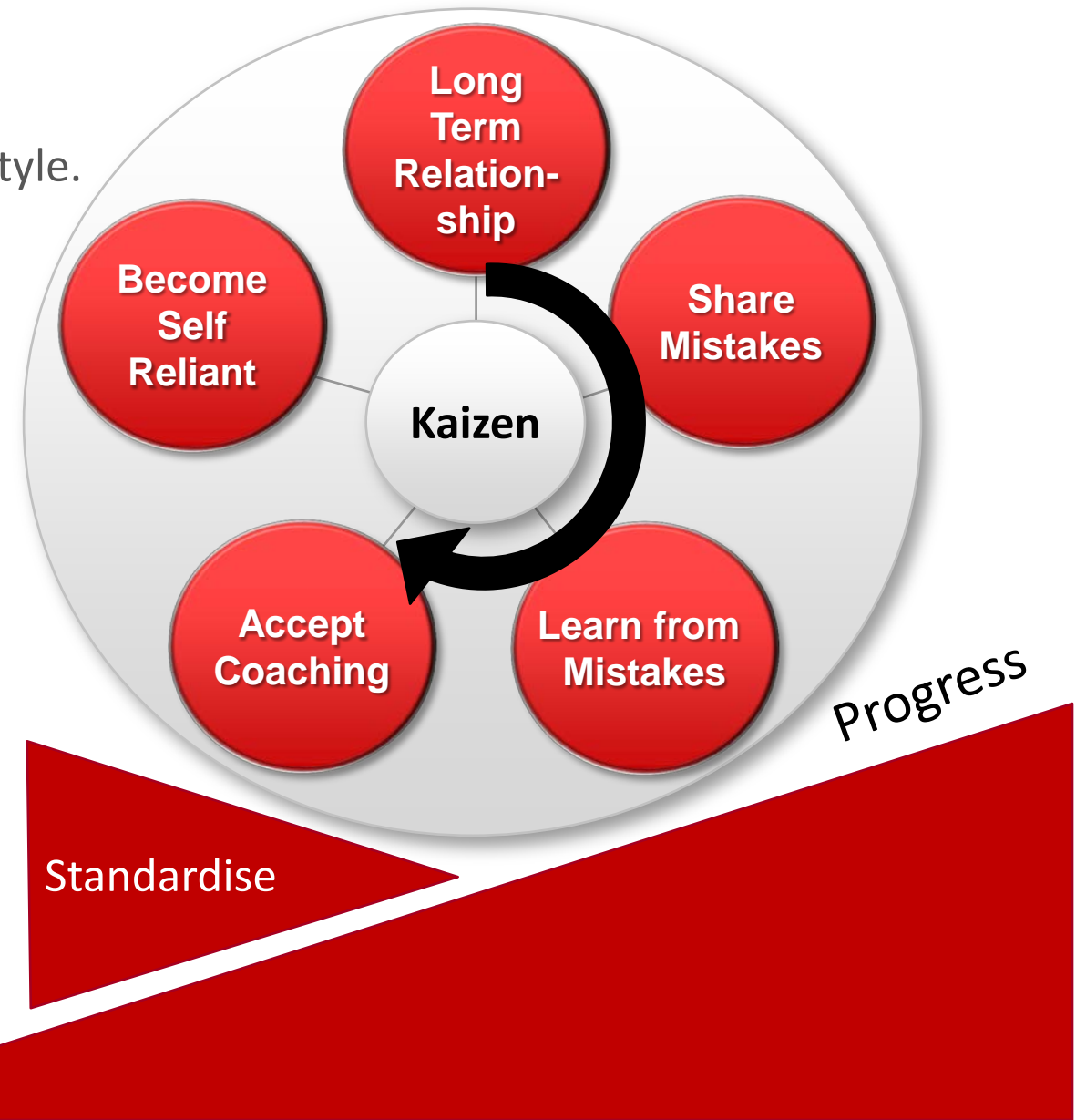
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Cross Company Sharing

Sharing Kaizen themes across Toyota Europe

- IS participate in formal Kaizen Sharing Events (EPKM) across Europe to;
  - Experience activity at the Gemba.
  - Catch any opportunities to improve our Kaizen approach and TPS understanding.
- Invite Top Management to participate in our IS Kaizen Sharing events (EIKM) to;
  - Honestly visualise our problems and improvement progress.
  - Receive advice and sometimes a different perspective to reflect upon.
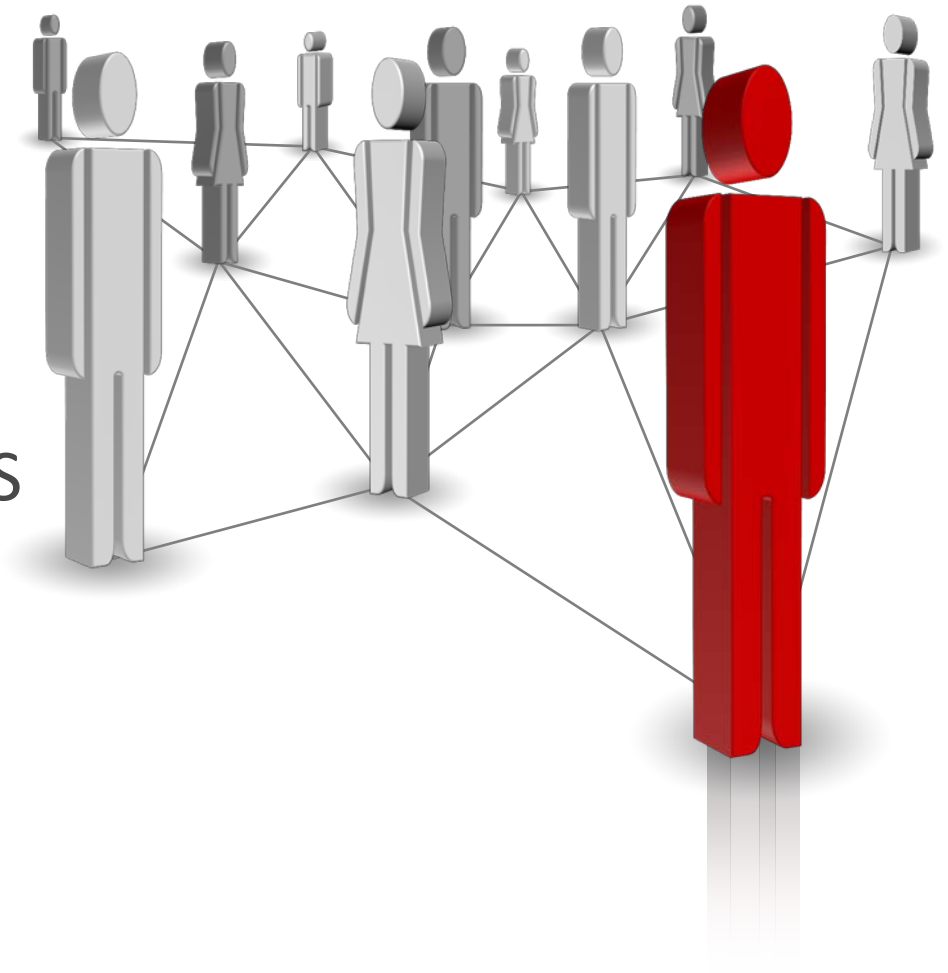
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Retain an open mind

Retain an open attitude – but make sure new tools are solving our problems.

- Keep abreast with emerging thinking and tools in the Industry.

- .. But don't fall into the trap of copying 'best practice' – does an approach solve a problem that we have ?

- Only use technology and tools when we understand and agree with the process.
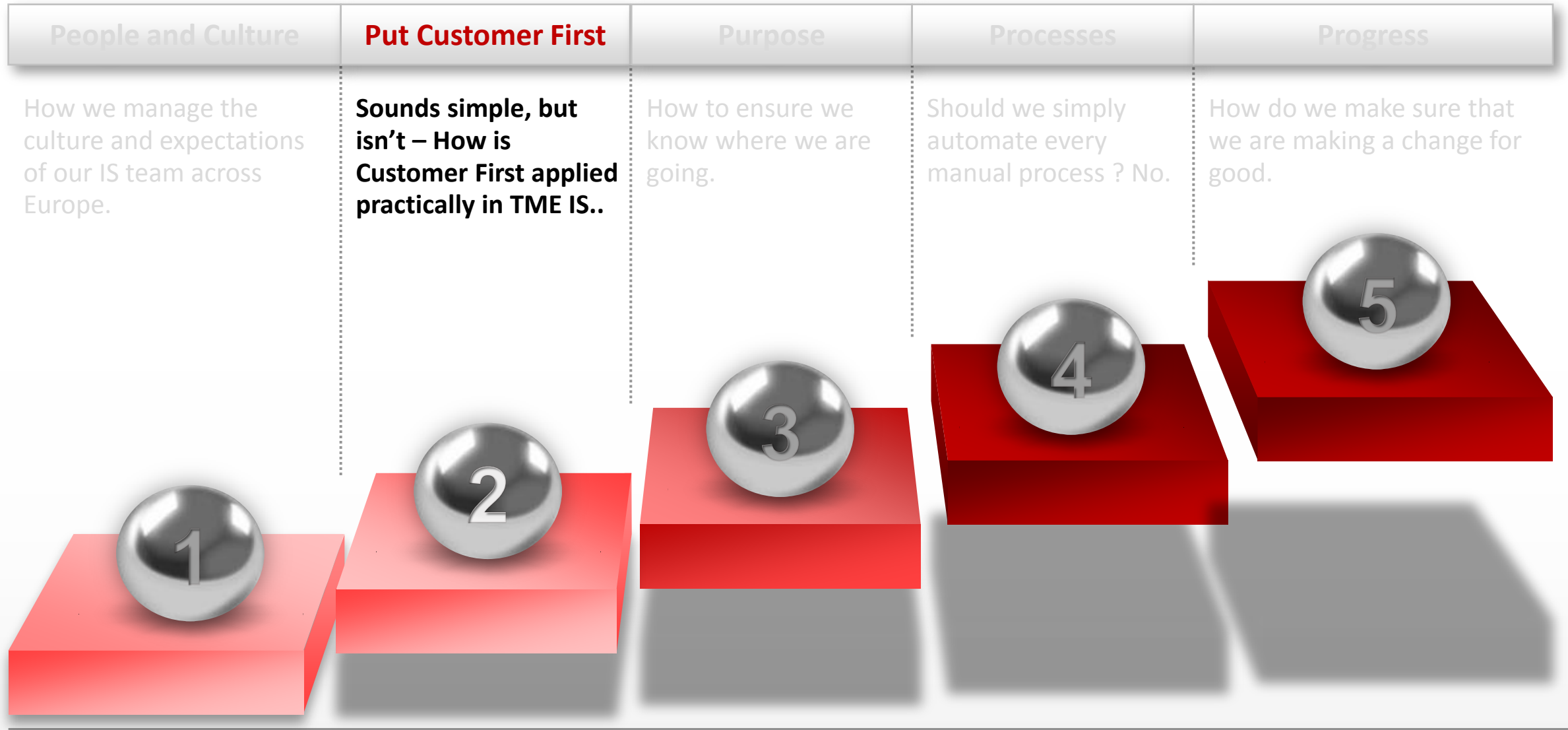
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Be Open – Some advice..

"Open the window.

It's a big world out there!"

Sakichi Toyoda

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Why is Toyota IS different ?

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Put Customer First

1 We need to carefully measure what is value and how we can deliver.

2 Frequent business talks with IS Management support to define how what we do fits customer needs.

3 Need to consider Customer First Foundations in doing the above.

Eg. Through Telematics and Consumer websites, IS has more opportunity to deliver value to our customers.

Delivering Value to the End Customer

CUSTOMER FIRST

Delivering Business Process Improvement

1 Top Management balance
- Customer Value,
- Company Sustainability,
- Contribution to Society.

2 Based upon firm direction and Management buy-in we have momentum to implement IS system, flexibly and at low cost.

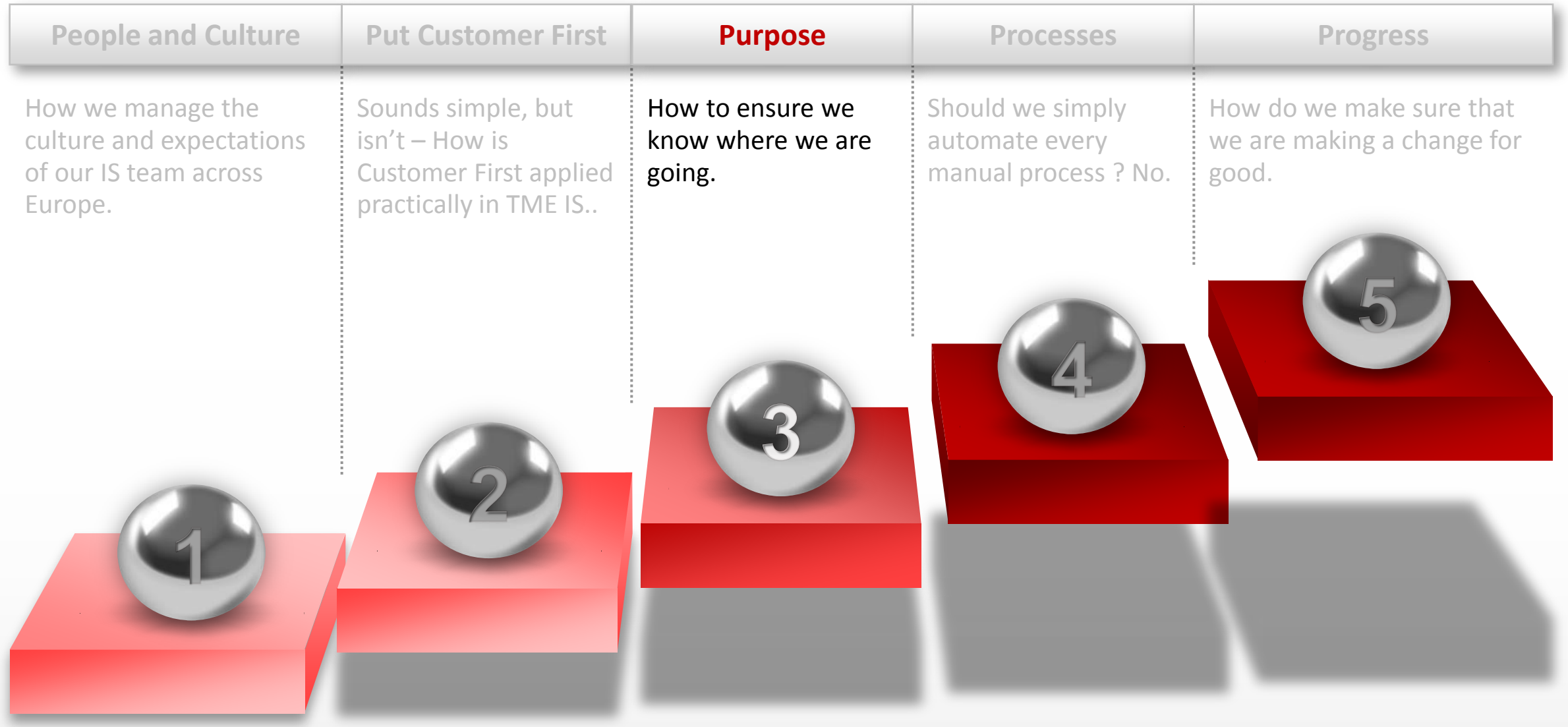**3** Must avoid the trap of being a 'Service provider' – need to be a Value Provider.

4 TME IS is in powerful position by engaging across business Processes to facilitate good change.

TOYOTA

Customer First Foundations

- Need to deeply understand the customer concerns.

- By going to the gemba, observing real operation, and in some cases by performing the job ourselves for a given time.

- We make opportunities for job rotation and graduate placement to broaden and deepen our understanding of the business.

- Never accept a system proposal from somebody who has never performed the job.

IS Ops

Application User

End Customer

Top management

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PDCA Advice from W. Edwards Deming

"Quality comes not from inspection, but from improvement of the production process."

William Edwards Deming

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Purpose

What is the meaning of our work

- Important to understand the essence of what we are trying to achieve.

- Use Hoshin Kanri and PDCA processes to achieve this.

- Engage very highest levels of management to do this effectively.

- Make special attention to closing the loop with Check/Act Stages – Project Audit.

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PDCA and Continuous improvement

PDCA Example – Ringi (Infrastructure Project)

TMUK Data Backup Infrastructure Replacement
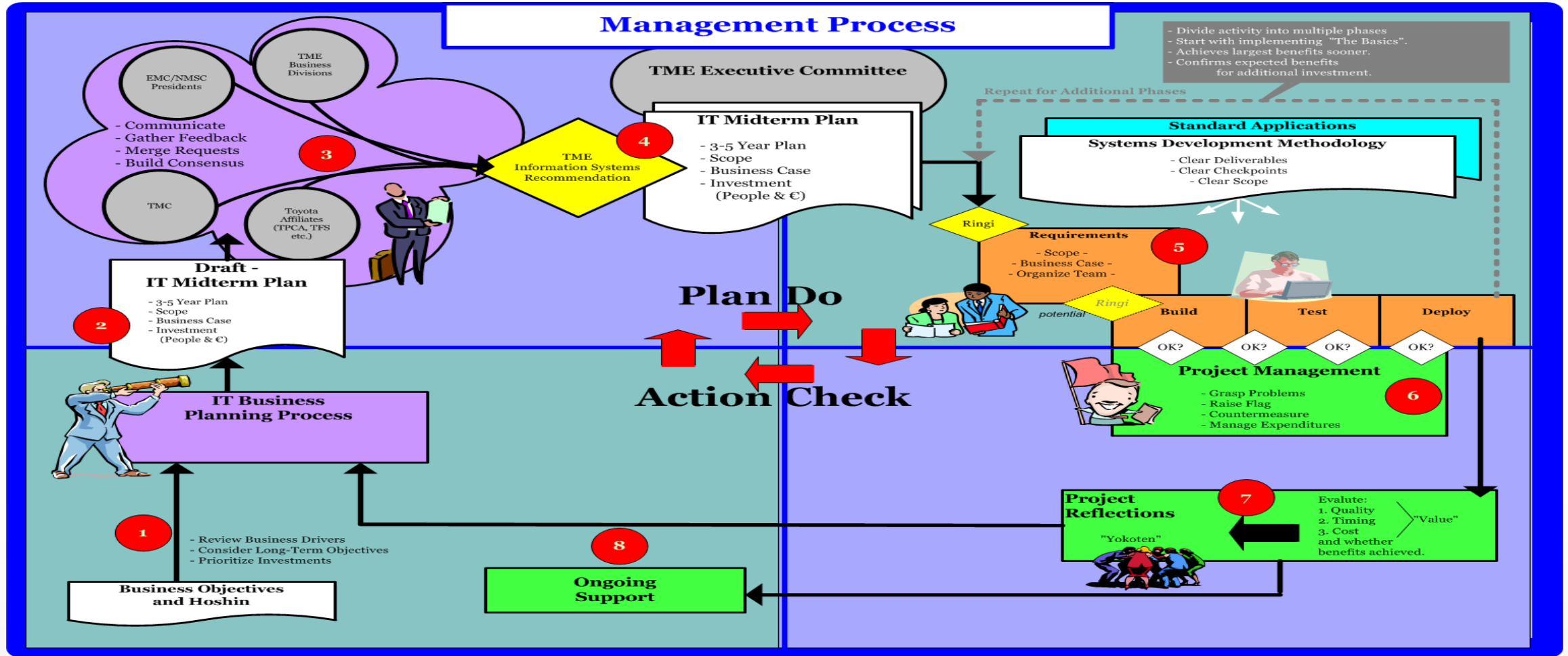
PDCA Example – Audit

- The official close of a project, typically three months after System Go-Live date.

- Objectively measuring;
  - Project Preparation.
  - Cost.
  - Quality.
  - Timing.
  - Post Go Live issues.
  - Promised Benefits.
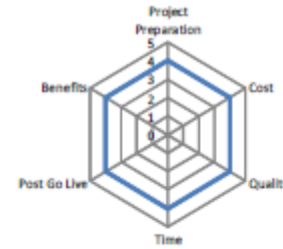
1) **Project preparation** : Plan prepared, organisation in place, orders were raised as plan.

2) **Cost** : Plan - ▓▓▓▓
   Actual - ▓▓▓▓
   The actual cost was lower than planned due to Burnaston kaizen activities free up licences which were then reused at Deeside.

3) **Quality** : Implementation went smoothly without business impact and there were no user backup or restore issues. Some minor changes to operational procedures were required (e.g. tape handling – additions/removals).

4) **Time** : The project was completed earlier than planned due to the data migration being faster than anticipated.

5) **Post go-live** : Backup, restore & archive procedures tested satisfactorily at Burnaston and Deeside - no backups were missed.

6) **Benefits**:
   a) Tape capacity is now adequate to include the Catia backups and the large increase due to the removal of archiving.
   b) Backups are now completing in a timely manner.
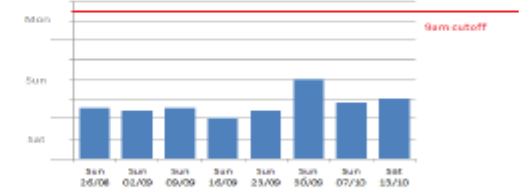
   c) The new tape library has the capability to be expanded to five tape drives and 75 tape storage slots.

   d) Deeside backup data is stored in only one location and DFS replication has been removed.
   e) Deeside restores are now on the local Deeside network thereby competing in a reasonable time and are no longer impacting the link between Burnaston and Deeside.
   f) Deeside backups are now on the local Deeside network and are no longer impacting the link between Burnaston and Deeside.
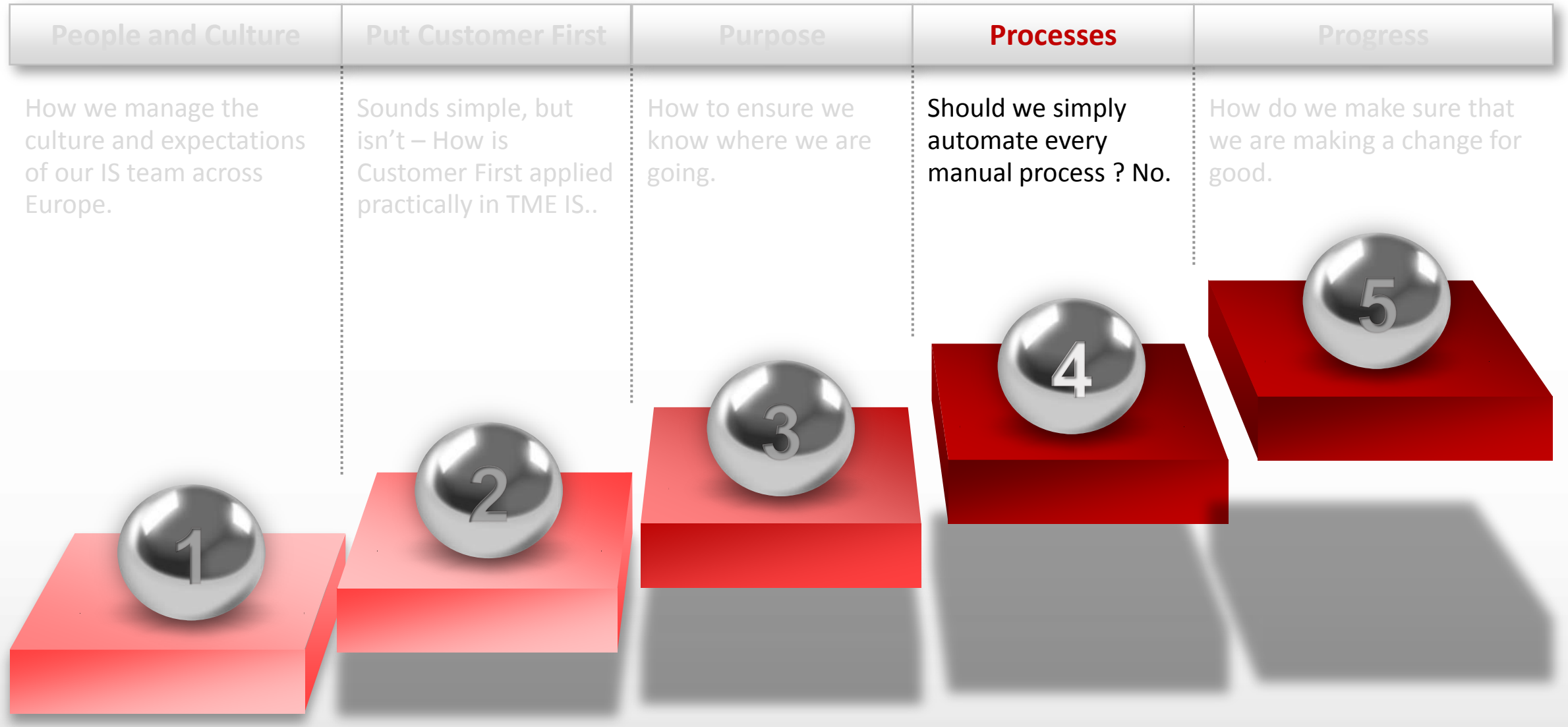
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Hoshin Kanri and PDCA Visualised in our Pan E IS Obeya

Steve Bell and Pierre Masai

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Process Improvement – What can IS learn from Manufacturing ?

- In the 1940's Toyota was faced with a problem; changeover time for sheet metal press machines were long – 12 to 24 hours; leading to large batch sizes = inventory = waste = cost.

- This hampered smooth implementation of Toyota Production System principles and high land costs meant inventory had a huge financial impact.

- **A significant process change was required – this became known as SMED.**

- The **S**ingle-digit **M**inute **E**xchange of **D**ie approach reduced setup time to 9 minutes or less – **but retained high flexibility.**

Breakthrough?

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Production Line "Die Changeover" Improvement

What was the breakthrough that could reduce a 24 hour process to 9 minutes or less?

3

SMED LEVEL 3 Technical Improvements and automation

- Install Quick Release Mechanisms & Eliminate Adjustments
- Modularise Equipment
- Implement Automation **(Finally)**

2

SMED LEVEL 2 Process Improvements

- Retrieve Parts before changeover
- Mark standard settings on equipment
- Eliminate waiting and unnecessary motion.

1

SMED LEVEL 1 Human Improvements and Quick Wins

- Define Role, measures and Accountabilities
- Coach teams & look for immediate process improvements
- Create standardised work

0

SMED LEVEL 0 Before Improvements

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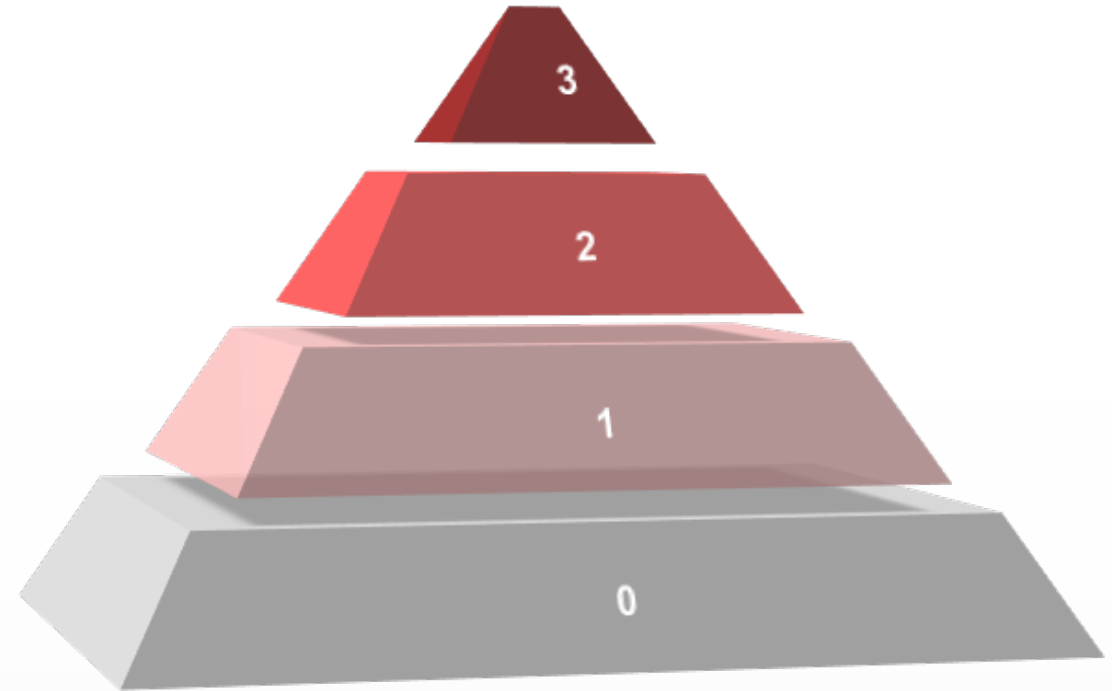
Process Improvement – Just Automate ?

Simplification before automation

- We address simplification and manual applications of processes before system development.

- This gives us more agility and ability to Kaizen our processes.

- This is different from many other companies.

- Our business units react to this differently – but in many areas (such as manufacturing and logistics) we enjoy huge benefits.

Current Situation

Human Improvements and Quick Wins

Process Improvements

Technical Improvements and automation

Ideal Situation

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Business Process Improvement

Taking the SMED analogy to BPI, *and in red showing the change points*
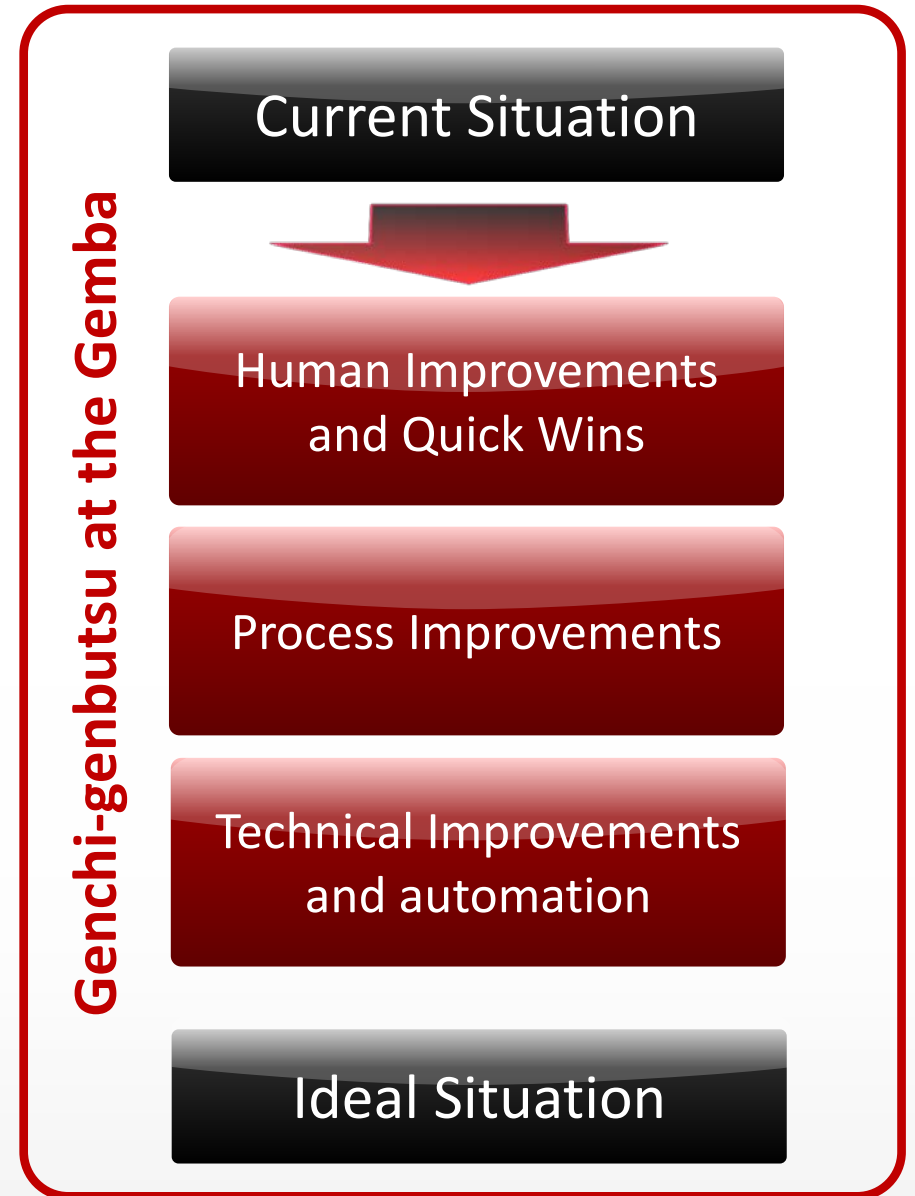
3 — **SMED LEVEL 3 Technical Improvements and automation**
- *Use Tools where they support a quality process*
- *Eliminate one by one variation and judgment based input*
- *Implement IS System*

2 — **SMED LEVEL 2 Process Improvements**
- *Establish and ensure „necessary conditions" for success*
- Establish measurement *standards to ensure high quality*
- Eliminate waiting and *unnecessary transfer of information*

1 — **SMED LEVEL 1 Human Improvements and Quick Wins**
- Define Role, measures and Accountabilities
- Coach teams & look for immediate process improvements
- Create standardised work

0 — **SMED LEVEL 0 Before Improvements**

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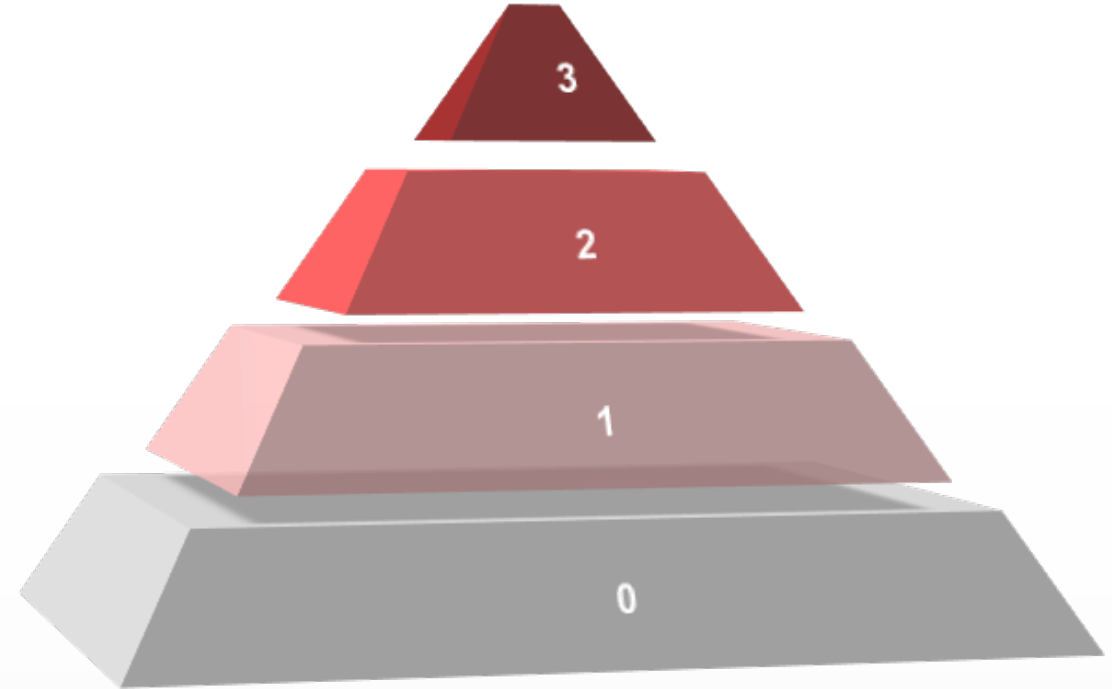
Process Improvement – Just Automate ?

Get the Process right

- Our focus on right process right systems means we may allow a variety of approaches to co-exist, and then reflect on their efficiency. Survival of the fittest will determine the winner..

- To make the best process and system we will also adapt our organisation to bring people who 'know the Gemba' to develop the systems rather than those who ignore it.

Genchi-genbutsu at the Gemba

Current Situation

Human Improvements and Quick Wins

Process Improvements

Technical Improvements and automation

Ideal Situation

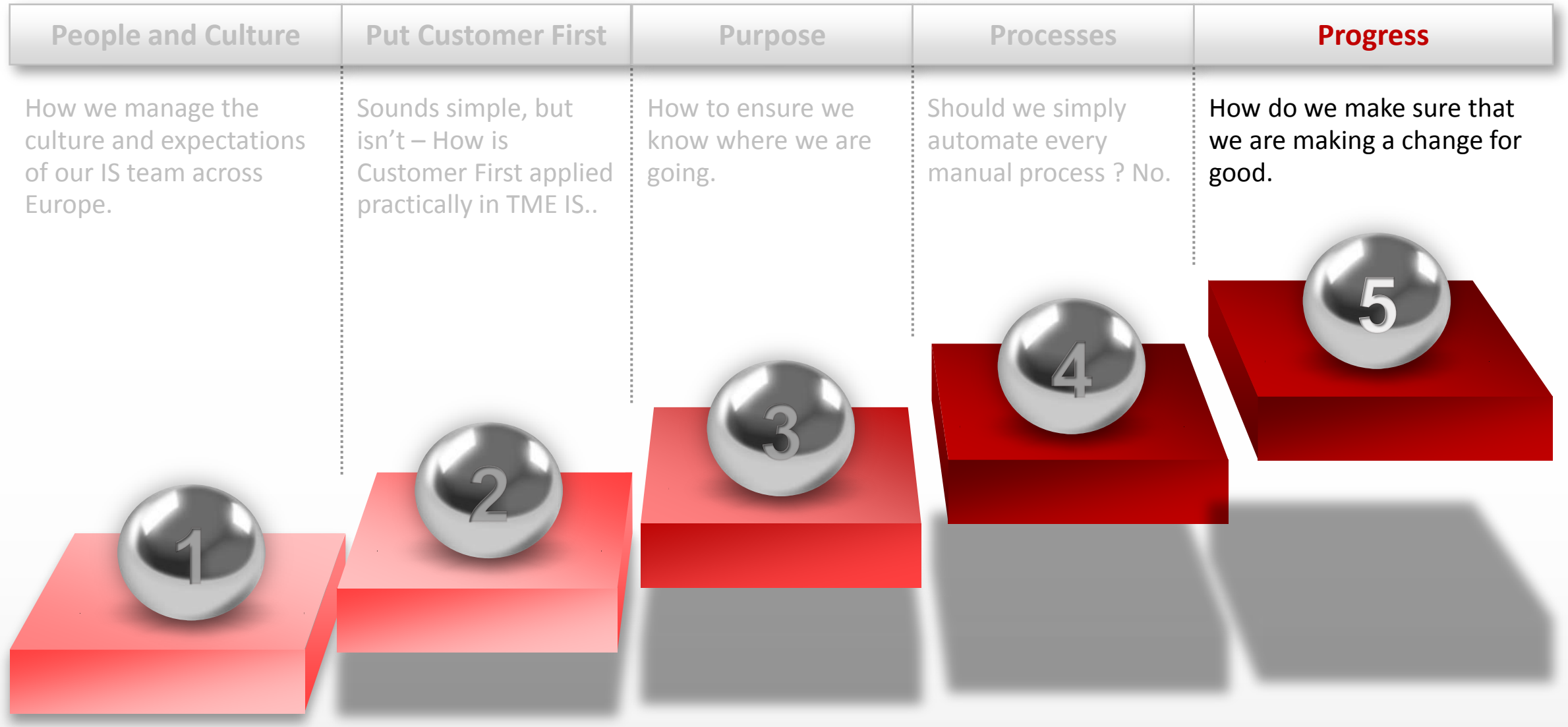**TOYOTA**

The application of methodology:

Project management and development Processes

- Enabling different approaches, closer to the needs of the developers in various areas (systems engineering, waterfall, agile, simultaneous engineering, etc)

- Rather than imposing a method, however making sure that a minimal set of gateways are absolutely respected.

- The methodology must embody the principles of built in Quality (Jikoutei Kanketsu or **JKK**).

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1 2 3 4 5

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Continuous Improvement – Real Numbers from Toyoda San.

"Our workers provide 1.5 million suggestions a year, and 95 per cent of them are put to practical use. There is an almost tangible concern for improvement in the air at Toyota."

Eiji Toyoda

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Progress

How do we Pursue Improvements

- We relentlessly pursue improvement of each Processes, every member is involved in this activity.

- We want to innovate and set the standard higher than we can achieve right now – after carefully understanding the priorities and risks.
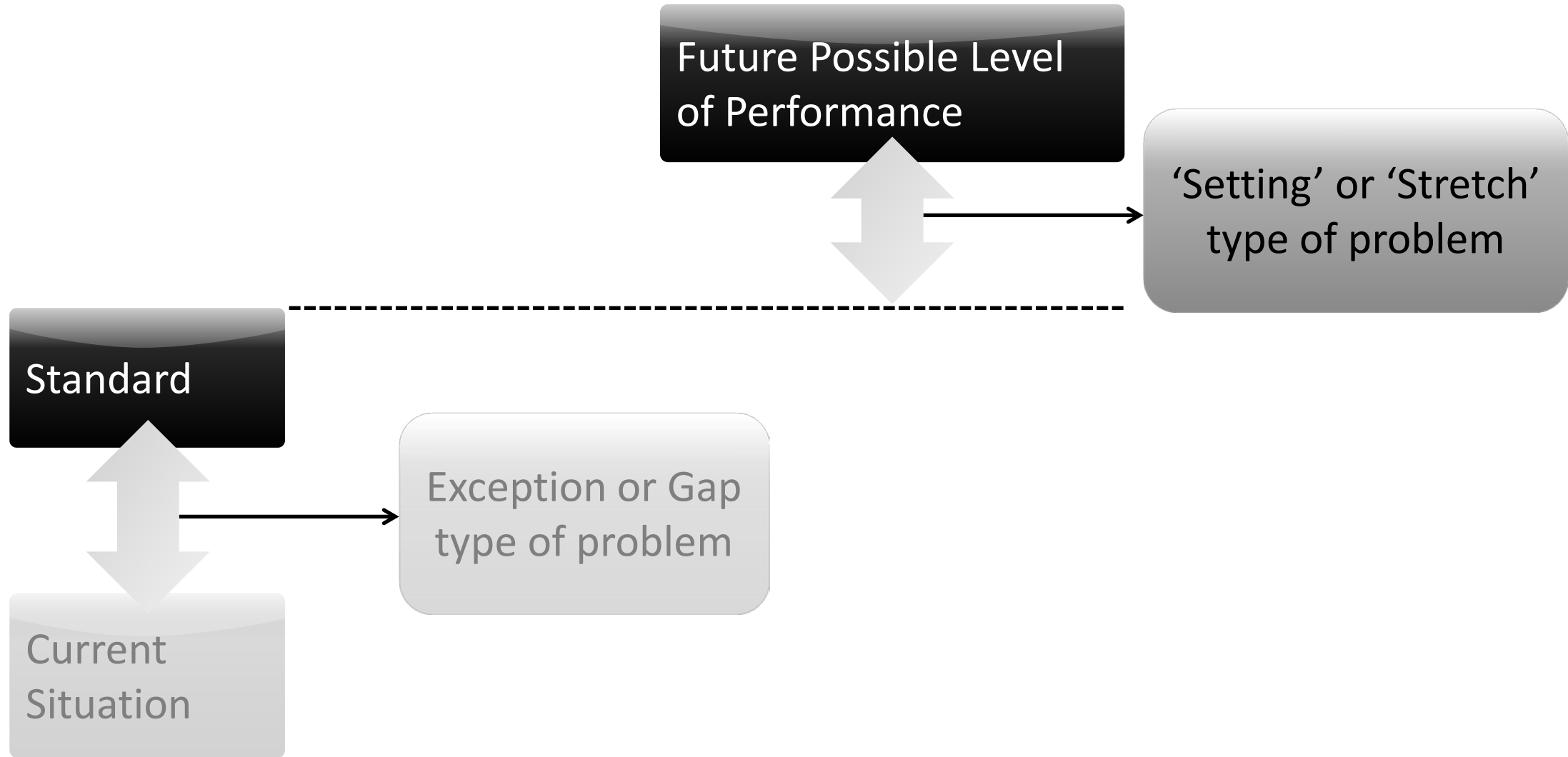

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Problem Solving – to generate Innovation.

Toyota Business Practices

Plan
- Clarify the Problem
- Break Down the Problem
- Target Setting
- Root Cause Analysis
- Develop Countermeasures

Do
- See Countermeasures Through

Check
- Monitor both Results and Processes

Act
- Standardize Successful Processes and Start next iteration

Concrete Actions & Processes

Motivational Guidelines

Toyota Business Practices

- Customer First
- Always Confirm the Purpose of Your Work
- Take Ownership and Responsibility
- Visualization (*MIERUKA*)
- Judgment Based on Facts
- Think and Act Persistently
- Speedy Action in a Timely Manner
- Follow Each Process with Sincerity and Commitment
- Thorough Communication
- Involve all Stakeholders

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Progress through Innovation

How do we Promote Innovation ?

- Initiated IS Innovation fair to create a productive atmosphere.

- Using Knowledge Management tools specifically to bring geographically diverse teams together who can inspire each other.

- Prioritize the innovation to make sure they are relevant to the business. Not allocate money to innovation with a percentage rule, but to demonstrated projects.

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Innovation – Products but also Process

Lets not forget about Process

- Bringing our progress theme back to Process;
  - We want to innovate our processes.
  - By getting close to them (Ohno Circle)
  - By 'doing what you think is right'
  - Not being afraid to propose, test and introduce a new way of doing something.

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Summary

Recap of 45 minutes in 45 seconds

- After introducing Toyota Europe, I hope I have helped you understand some of the background and essence of some Toyota Terms and Principles.

- But mainly I hope I have explained how Toyota Motor Europe IS are relentlessly pursuing improvement by using and improving our understanding of Toyota Way.

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