



## **WP5- The Determinants of Internationalisation of Knowledge Intensive Activities of MNCs**

**Strategies for successful global R&D  
Organisation & Management**

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# Methodology

## Case Study Approach

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- Automotive, ICT
- HQ and Subsidiary Perspectives of EU MNCs
- Interviews from:
  - HQ of EU MNCs,
  - their R&D subsidiary in India
  - their R&D subsidiary in China
- Validate the data from interviews
  - Press Releases, Corporate Website





## Aims

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- R&D Structure
- Strategic perspective -what HQ look for in India & China
- Evolution -functions, capabilities
- Offshoring Strategy & Localisation Strategy
- Knowledge Transfer & Knowledge Integration
- Management Challenges
  - coordination, external collaborations, IP and HR issues





# Strategies for successful global R&D Organisation & Management

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Whether Offshoring Strategy or Localisation Strategy.....

- Development activities pre-dominates
- Research in the R&D centres in India and China
  - a minor part of the activity, about 5% of the activity
- And is mainly done in collaboration with universities and research institutes





## Strategies for successful global R&D Organisation & Management

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Whether Offshoring Strategy or Localisation Strategy.....

- Ability to get more for the R&D investment in India & China
  - Strategies complimenting the different strengths
  - With cost-efficient aspect per R&D individual
  - Special local specific requirements & strain on the product (low-end, basic, large volume) becomes **basic requirements that is on systems & platforms for global products**





## Strategies for successful global R&D Organisation & Management

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Whether Offshoring Strategy or Localisation Strategy.....

- **Has strong links to the specific country's NIS**
  - FDI in China greater & stronger compared to other BRIC
- **Strong individual elements of a particular NSI**
  - emergence of stand alone R&D centres in India
  - new and emerging research in high-tech areas that do not have any links or interaction with local production activities





# Strategies for successful global R&D Organisation & Management

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Whether Offshoring Strategy or Localisation Strategy.....

- Networks and IP Management strategy reflects the kind of internationalisation strategy for India and China
- Internalise Competence that are Local
  - Collaborate with local industry partners to gain knowledge, to expand into System development etc.
  - Local Research Links with universities feed into product enhancement & new technology
  - Local networks for research, recruitment





## Auto Sector - Continental

- Automotive Group of Continental
  - one of the leading global automotive suppliers.
  - develops components & systems for vehicles
- 3 Divisions – Chassis & Safety, Powertrain, Interior
- Powertrain Division - one of top 3 in the world.
  - Employs 24,000 at about 60 sites around the world.
  - Sales € 3.4 billion in 2009
  - Europe 58%, Asia 21%, NAFTA 20%, Other 1%
  - Germany 28%







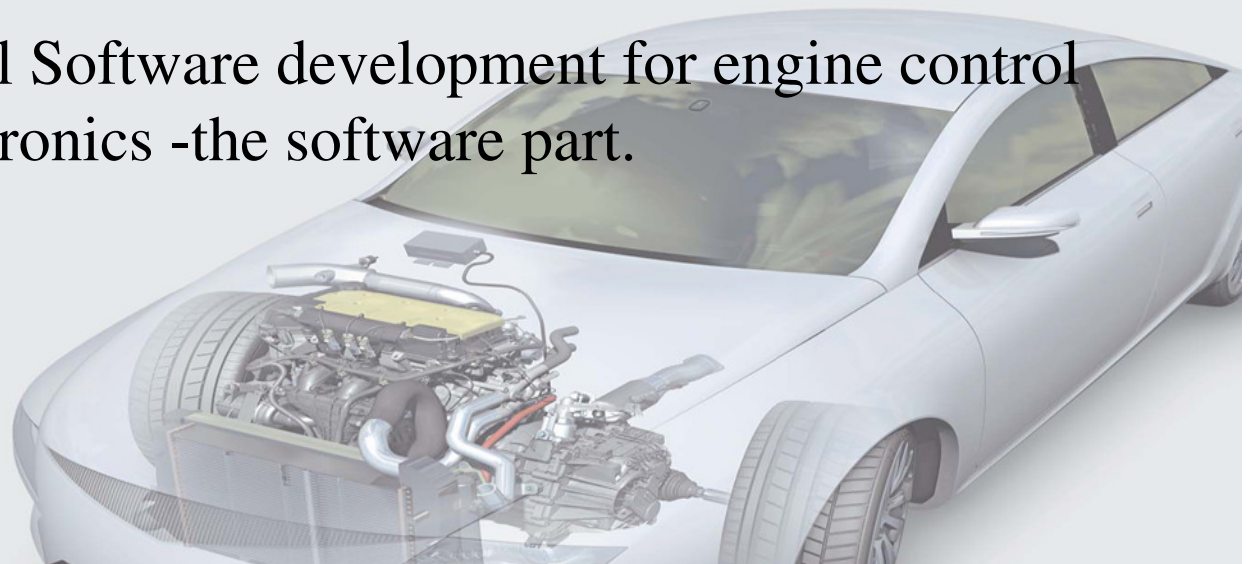
# Continental –Automotive Group, HQ

Head, Business Unit- Engine Systems, Systems & Technology,  
Powertrain Division

12 Locations in 8 countries

## Responsibility

- Worldwide for all Software development for engine control
- Automotive electronics -the software part.





# Continental Corporation

## Automotive Group

## Rubber Group

Chassis  
& Safety

Powertrain

Interior

Passenger  
& Light  
Truck Tires

Commercial  
Vehicle Tires

ContiTech

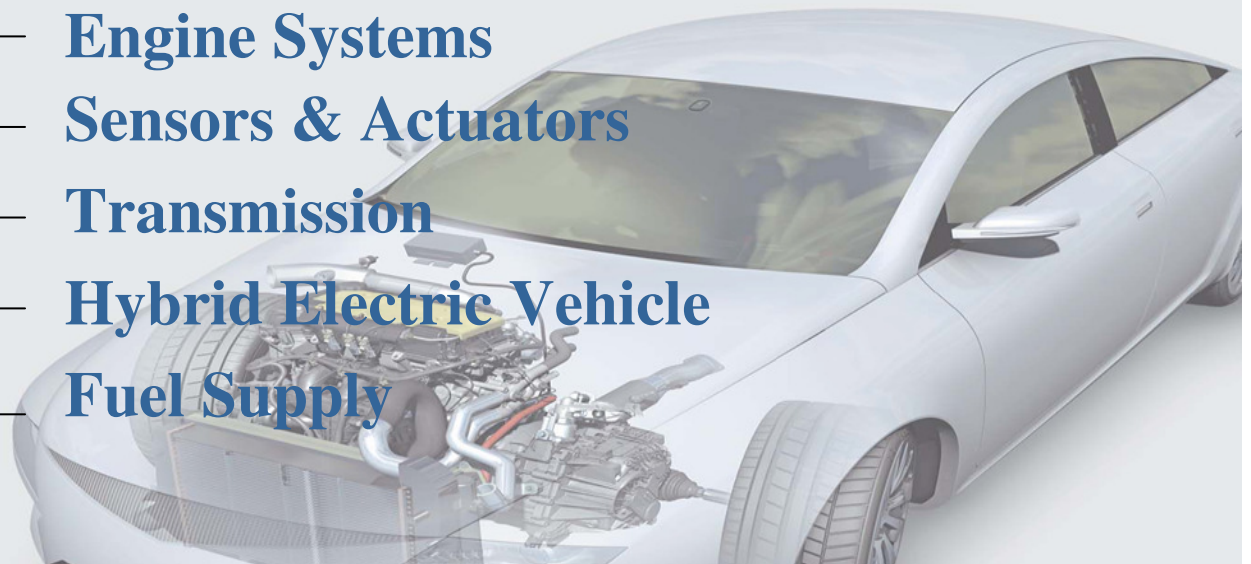
Engine Systems

Sensors & Actuators

Transmission

Hybrid Electric Vehicle

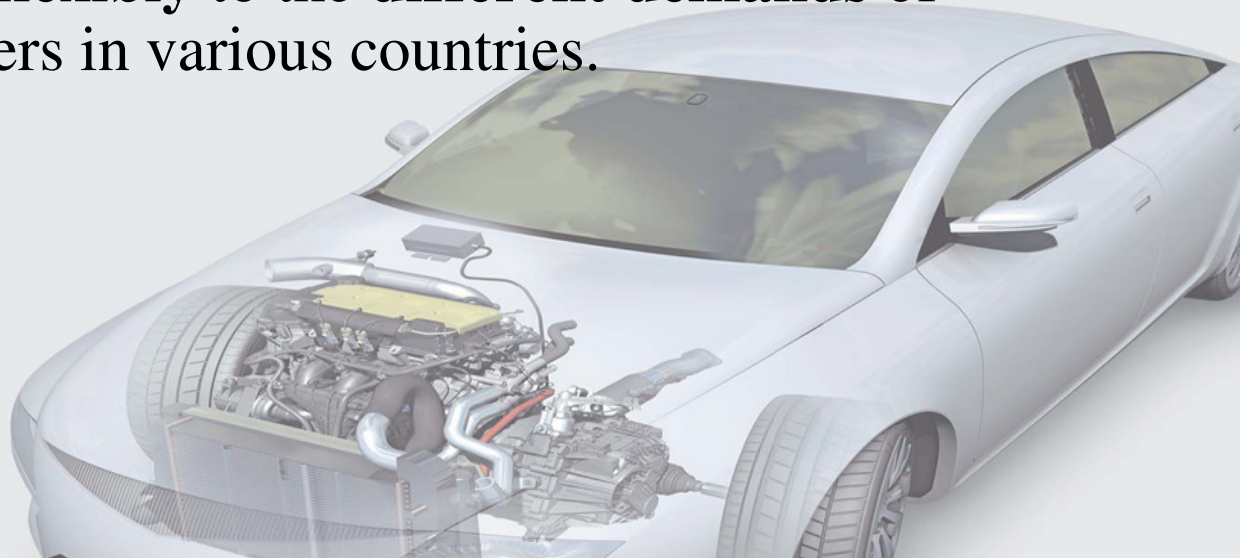
Fuel Supply





## Development Principle in the organisation

- Generic or Base Development Team in Germany & France
  - **Develop the core modules that all the countries can use**
- **Modularity of components**
  - **Allows to react flexibly to the different demands of vehicle manufacturers in various countries.**





# Internationalisation Strategy India & China

- China follows the world-wide **Localisation strategy**
  - use existing module & existing platform made by the generic team and make adaptations
  - all customer projects & all adaptations done locally
- India – an **Offshoring** location for Global market for software development.

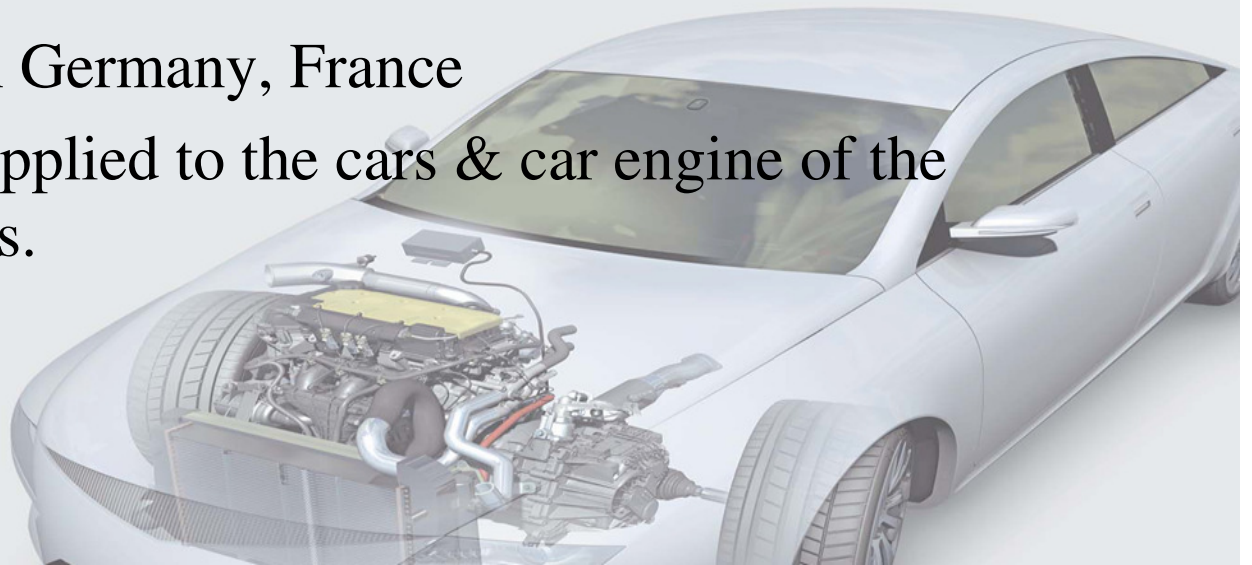




# Management and Organisation of R&D

Management Model followed- Mix of people

1. in Western countries
  2. in Customer locations
  3. in Offshore support
- Core Software
    - Developed in Germany, France
    - all software applied to the cars & car engine of the manufacturers.

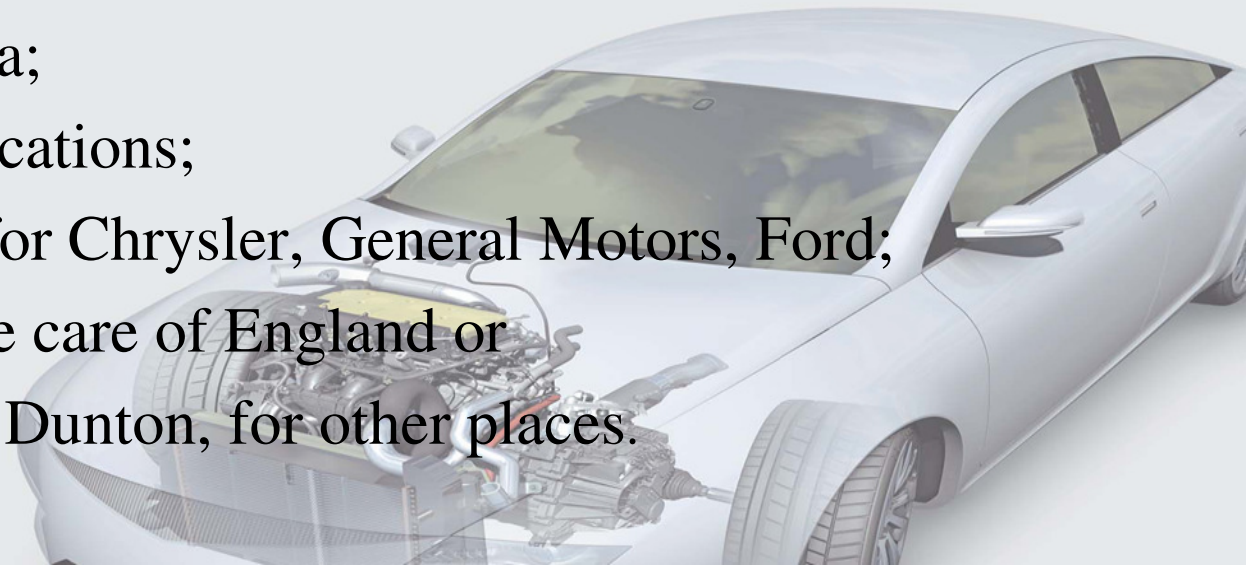






## Management and Organisation of R&D

- Customer locations
  - Teams located wherever big car manufactures are located
  - Take the core software and apply it or modify it for the different engines.
- In Korea for Hyundai, Kia;
- Japan for Honda;
- China in two locations;
- one in Detroit for Chrysler, General Motors, Ford;
- France also take care of England or
- Ford Europe in Dunton, for other places.





# Management and Organisation of R&D

- Offshore Support
  - Workforce in India, Romania & Mexico
  - basically helping all the other teams
  - 40% of the development efforts come from these countries.

## Continental Technical Centre India (TCI)

- Software development centre that **supports the core development of multiple products across Business units**
  - 150 projects
  - 160 people on internal rolls, 300+ people thru partners.





## Continental R&D Centre China

Engine Systems BU, Powertrain Division, Set up- 2006

- Responsibility
  - engineering activities, engine systems- China and Japan
  - Brought in to build up the Hardware team,
  - Initiated the engineering team, now 170 R&D personnel.
- Strengths
  - Pragmatic, Look for **simple solutions** and **quick solutions**
  - Motivated







## Continental R&D Centre China

### Tasks: 1. System Integration & Calibration

- Take existing individual components –
- Integrate
  - Electronic Module from Hardware team in China
  - Software from the software team in China
  - Fuel rail assembly and injectors from the team in China
  - Sensors, pumps some provided by external suppliers or other BU





## Continental R&D Centre China

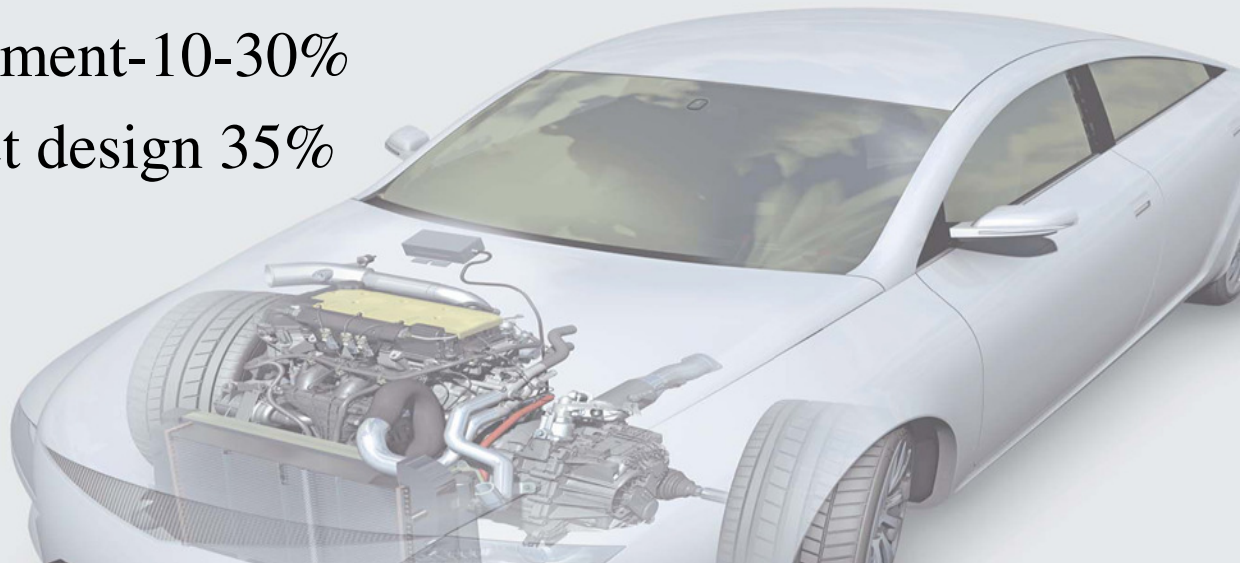
Task 2: Local Adaptations of existing components

Most hardware & software components are already Localised

All Project adaptations, Prototype build & configurations

100% of the work is done by the Customer Project Team in China

- Calibration 50% of the activity
- Software Development-10-30%
- Hardware- product design 35%





## Continental R&D Centre China

### Localisation Strategy

- China along with India- strategically vital markets
- Components for China can be localised only in China
- Low-end platform for small engine
- Being Close to Customer - a prerequisite
- Reactivity needs
- Low cost
- Ramp up due to availability of local talents





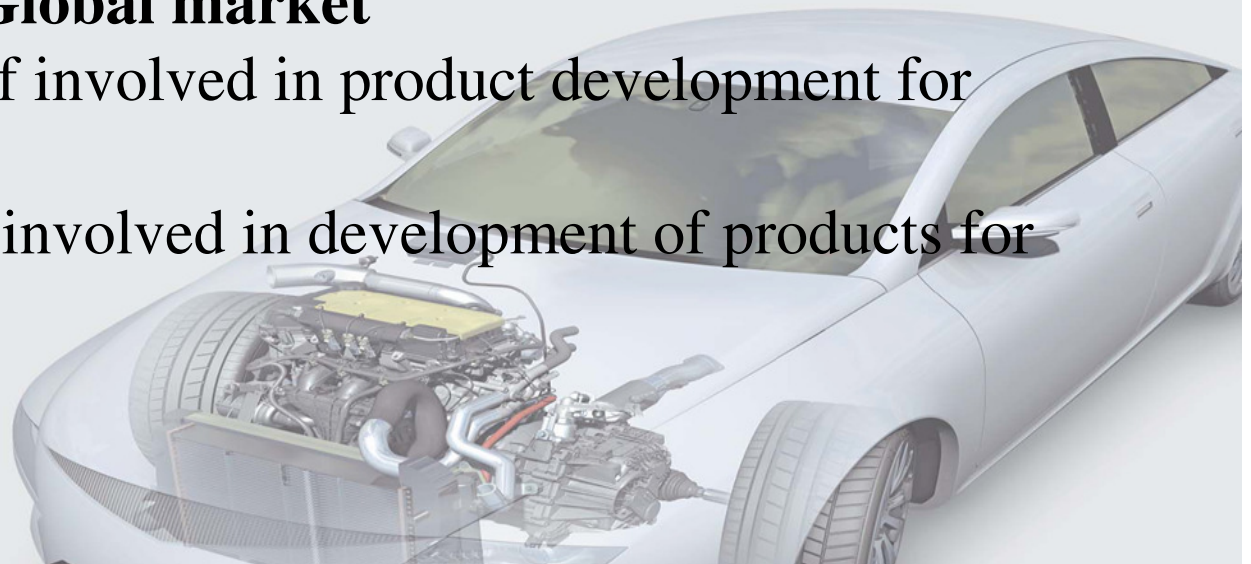
## Market Orientation

### R&D Centre China

- Mainly for **Chinese market** (hardware also for Japan)
- Only 10% of the R&D staff are involved in creating entirely new products

### R&D Centre India

- Mainly for the **Global market**
  - 95% R&D staff involved in product development for World market
  - 5% R&D staff involved in development of products for Indian market

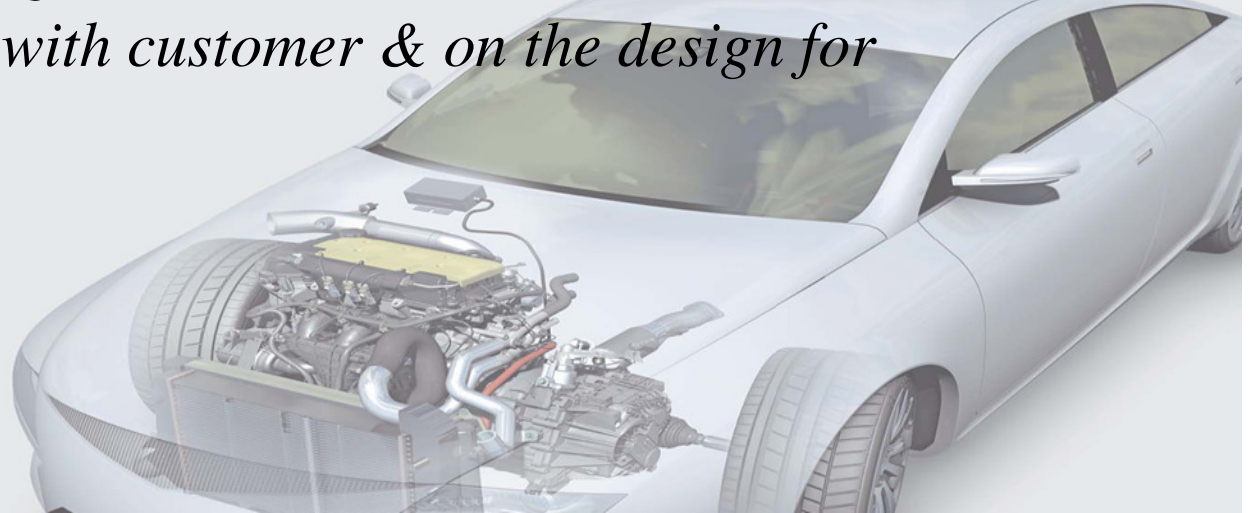




# Management Challenges

- Big Challenge- **Innovative new ideas**
  - Supplies to 23 car manufactures, Foreign & Chinese.  
However, cannot count on the HQ for new ideas
  - Each country has its mindset, way of working, its future

*‘ I do not expect HQ to understand how we should act in the daily business with customer & on the design for China’*







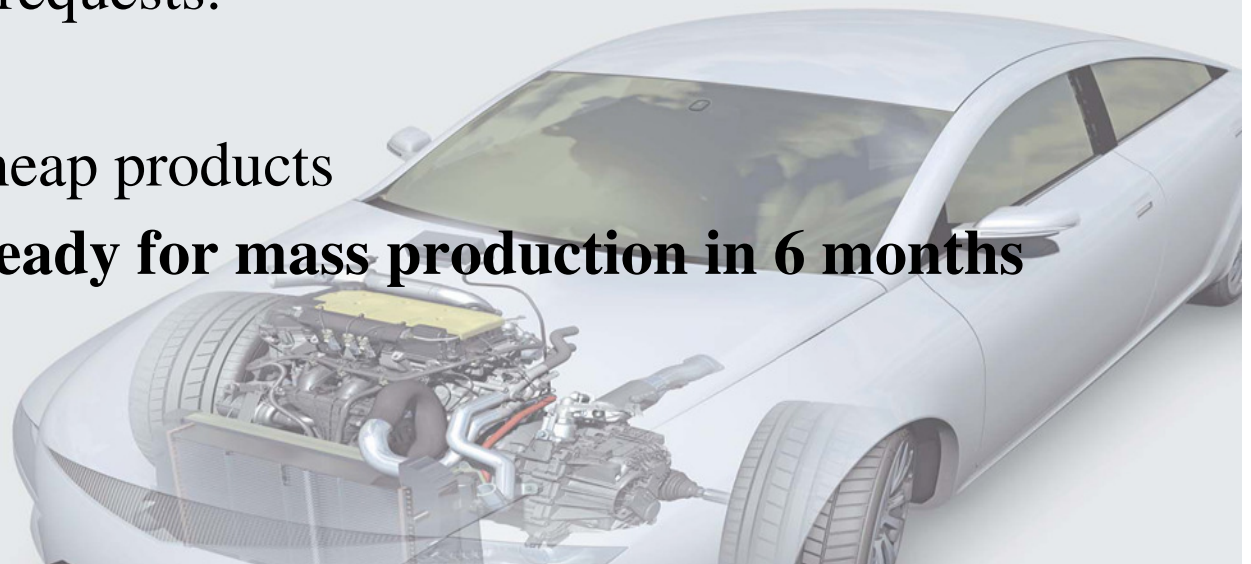
## Management Challenges

Expertise to adapt more Engine functions locally.

- However, cannot promote this at the centre:
  - requirement non-existent.
  - local OEMs not keen on such modifications,
  - limited change requests.

Rather,

- OEMs demands cheap products
- products that are **ready for mass production in 6 months**



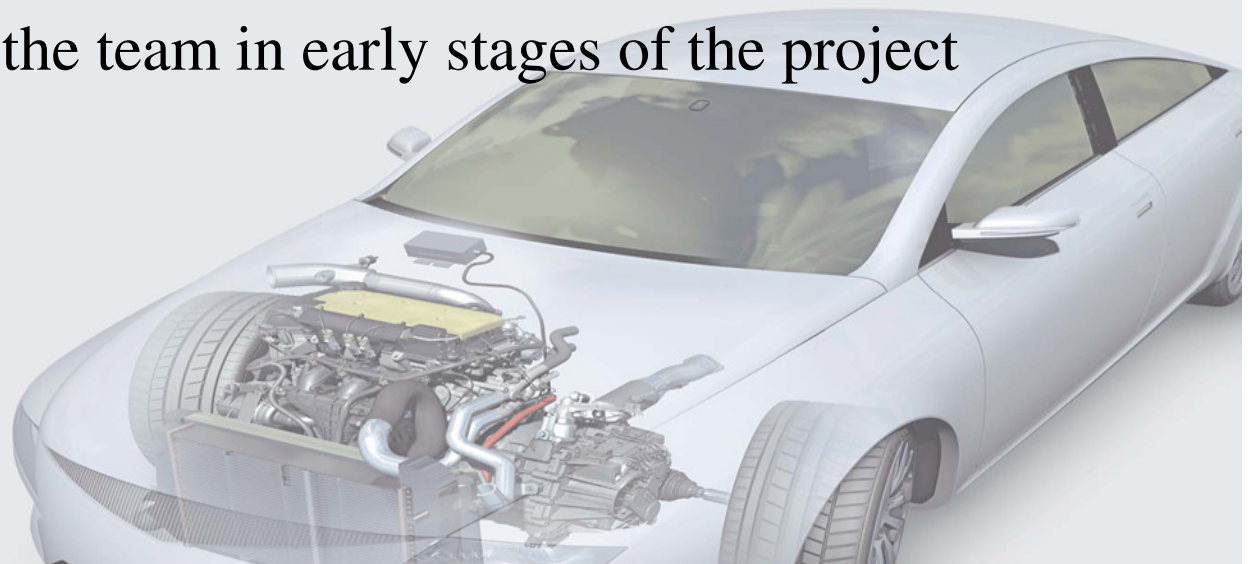


## Management Challenges

- Recruitment of Expatriates to overcome this challenge

### Benefits

- Experience working in complex projects in Europe
  - Enhanced technical level when employees come back
  - Establish very good Networks & Connections with HQ
- Co-location of the team in early stages of the project



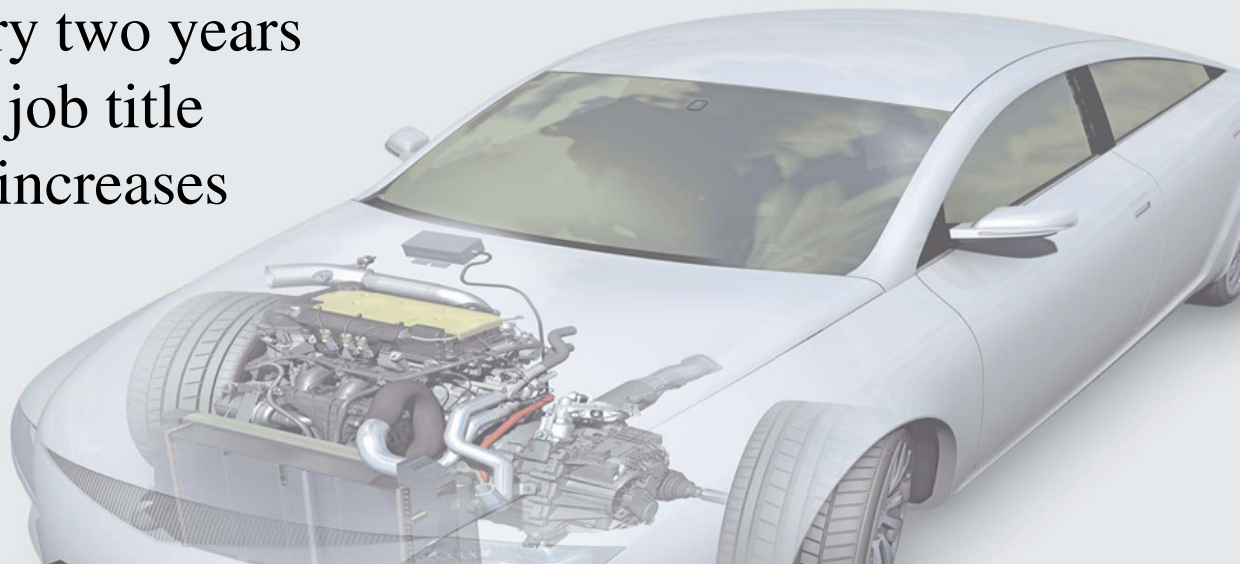


# Management Challenges

## Attrition rate

Influx of foreign car manufactures increasing their R&D in China, head hunting

- **Carefully Articulated HR Management**
  - Communicating the success of the organisation
  - Clear plan for career steps & communicate it
  - Promotion every two years
  - Changes in the job title
  - Provide salary increases







## Management Challenges

- HQ person as Head of R&D China
- India R&D Head recruited from India
- In-charge & Driving the low-end platform in 2006
- Aimed at defining the right product for the small engine
- China basically low-end platform
- Increased responsiveness and reactivity
- Europe Links- **trust** and **known by all**
- Person from HQ to setup the R&D centre safer option
- **IP is an issue in China-** many products copied in the past





# Managing Intellectual Property

## Software and Hardware

- Challenge with regards to IP
- Prefer In house, as it is difficult to manage IP in external collaborations

## Test equipments for Systems

- Prefer External partnerships for cost reasons
- heavy investments worth 5million Euros





## External networks

### -R&D centre China

- Local University Collaboration intended to recruit best talent
  - software projects at universities in Changchun
  - electronics projects at universities in Shanghai

### -R&D centre India

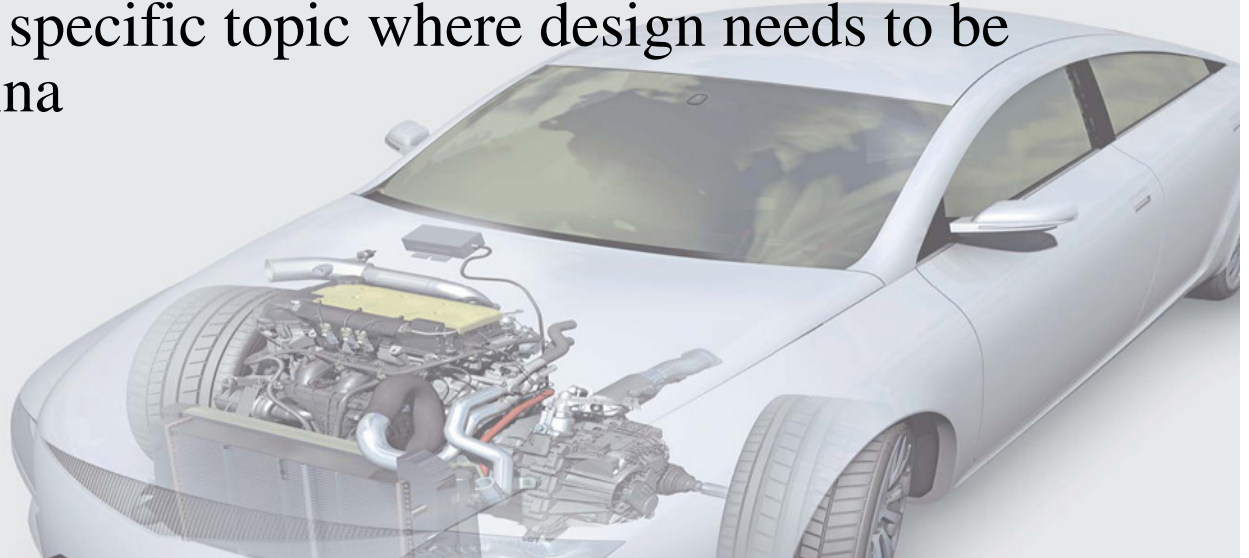
- BU Partners with Tata Elxsi, Mahindra & others
  - to gain Automotive knowledge,
  - to expand into System development from the current mode of work package execution





## Knowledge Integration China → HQ

- Teams collect local market needs, local market requirements
- Challenge the European team, in some part of the design
- Guide them on specific topic where design needs to be improved for China

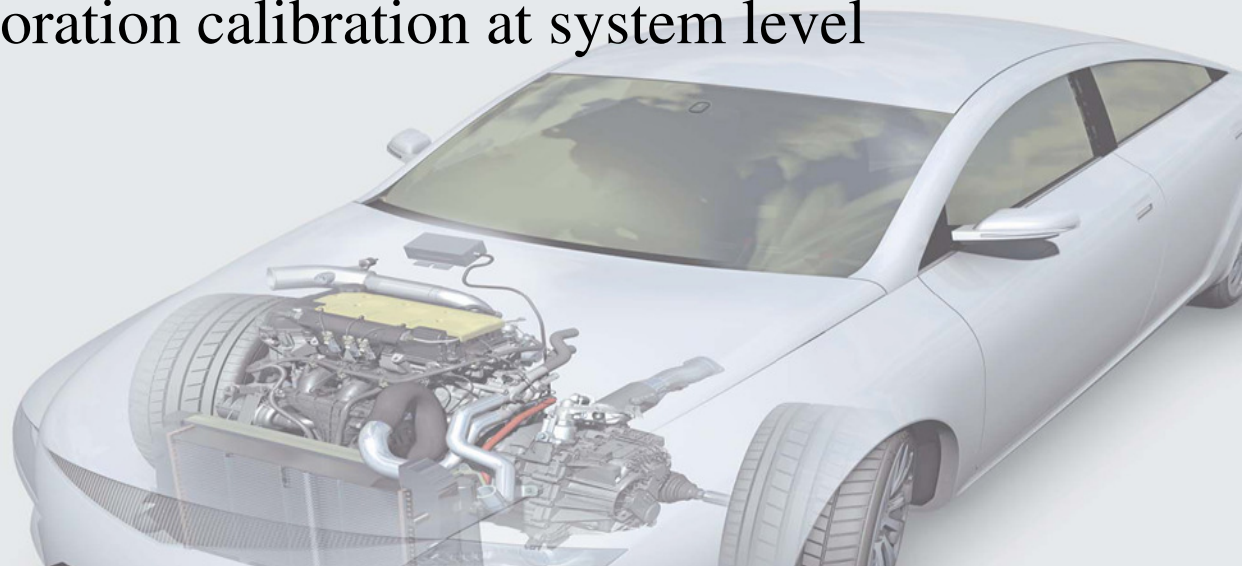




## Knowledge Integration China ↔ India

Cooperate with India on Diesel Low cost products

- India – expertise in Diesel engine
- Engineering team in India has strength in Diesel
- Diesel Requests from OEMs in China
- Currently collaboration calibration at system level







# Ericsson

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- Mobile & Fixed Network Infrastructure, Broadband and Multimedia Solutions for operators, enterprises and developers
- 3 Business Units
  - Services: telecom services
  - Networks: communications networks
  - Multimedia: multimedia solutions
- Revenue from Ericsson overall sales  
Largest US, followed by China & third is India





## Ericsson

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- HQ- VP & Head of Development Unit Revenue Management
- Responsibility-  
Revenue Management Products and Solutions  
e.g. Ericsson Charging System, Multi Mediation products
- Development Organization  
800 team members-  
400 in Karlskrona (Sweden)  
400 in India (Chennai & Gurgaon).





## Ericsson R&D Centre India

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- Extension of Multimedia Business Unit
  - has several solution areas.
- India centre focuses on Revenue Management
  - set up in 2006 has grown from 80 people to 400
  - Enhanced capability and extended functions
  - end-to-end product development capability.







# Product Portfolio

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- Pre-paid systems
  - Base product and also the largest product today
  - 865 million subscribers being charged to Ericsson's pre-paid
- Analytic Switch - new product placed at the centre
- Wholesale product portfolio
- Product portfolio for mobile money





## Strategic perspective- what HQ look for in India

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- **Ability to get more** for the R&D investment
  - with cost-efficient aspect per R&D individual
- **Software development** is the core strength & core business
  - Huge pool for software engineers, software developers, software testers, software architect, software technical managers.
- **Different strengths and weaknesses**
  - by complimenting those skills able to get more out of those organisations.





## Strategic perspective- what HQ look for in India

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- **Strategically vital market**
  - Third important market currently
- **Big revenue stream** in India.
  - All the products developed in India sell very well in India
- **Excellent cooperation** with most operators in India





# Offshoring Strategy

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- Key Driver: ‘...in doing off-shoring, have all the people in house Ericsson. Development means a lot of investment in competence of people, that competence to stay with Ericsson’
- Control in careers and attrition
  - ‘.....enable people to be challenged inside the company but where control is possible’





## Strategy for all Products

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- Develop **standardised products** that is applicable to the **Global market**
  - products developed in India are in no way targeted for India even though they are a success in India.
- **Customisation work** in India for those products placed in India is again for the **Global market**
  - The result of the **standardised concept** utilised by Ericsson





## Patents Strategy

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- As technology leaders, to secure that leadership through patents.
  - secure **IP rights** with patent applications in the **research area & in development area**
- India contribution towards patents is one-third.





## Evolution– Shift in Strategy

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- 5 years ago, only placing **part of the product responsibility** in India, **development** and **test**.
- In last 3 years moved
  - full product responsibility
  - definition phase of the product, as well as
  - managing the product
- Place new products mandates, not just move products that are at the end of their life cycle
- Product mandate placed in India done only in India and no where else.





## Knowledge Transfer HQ → India

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### Increasing Capability

- Transfer project- to build up **matching capabilities**
  - formal on-the job training
  - support for 6 months after the hand-over
- Transfer of **long term history** of the product
  - have product history, architectural thinking
  - technical people join
- As **System** is more long term to build up
  - people from HQ in leadership position to nurture and build those competence.







## Knowledge Integration India → HQ

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- **Big Challenge** is the **Huge network**, so many people **using these networks**- the Indian operators and the market place in India
- Makes **special strain & special requirements on the products**
- Is captured from the Indian market
- Input into the basic requirements that is on systems





## Knowledge Integration India → HQ

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- **Patents**
- Technology development
- Working practices **when cooperating with universities**
- **Proof of concepts**  
-specific technical investigation that is done for the global organisation





# Management & Organisation of R&D

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## Main Coordination Strategy

### **Place product mandate in India**

- ensuring **end-to-end product** responsibility
- **technology leadership & execution of it**
- **Even R&D centre Cooperation** with other Ericsson units, customers, countries
  - exchanges happen directly between organisations
  - no filtering mechanism in Sweden
  - cut the hand-over, cut dialogue with HQ





# Management & Organisation of R&D

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## Overcome disputes

- by ensuring that it is **end-to-end responsibility**

Historically seen that:

- when responsibilities are split over sites
- the site just point at each other when something goes wrong
- it becomes extremely hard
- it results in a blame game instead of solution mode

- **Multicultural awareness**

- ensure that key leaders are very well aware of the different cultures in Europe and Asia.





# Management & Organisation of R&D

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## Coordination Mechanism

- Shared development infrastructure, Integrated workflows, Finely defined roles and responsibilities
- **Technologies for communication**  
Use of all kinds- collaboration tools, BTG conferences, phone & video conferences, but also a lot of **Face-to-Face**.
- **Distributed** projects working on same product across Sweden, India **are exceptions**







# Management & Organisation of R&D

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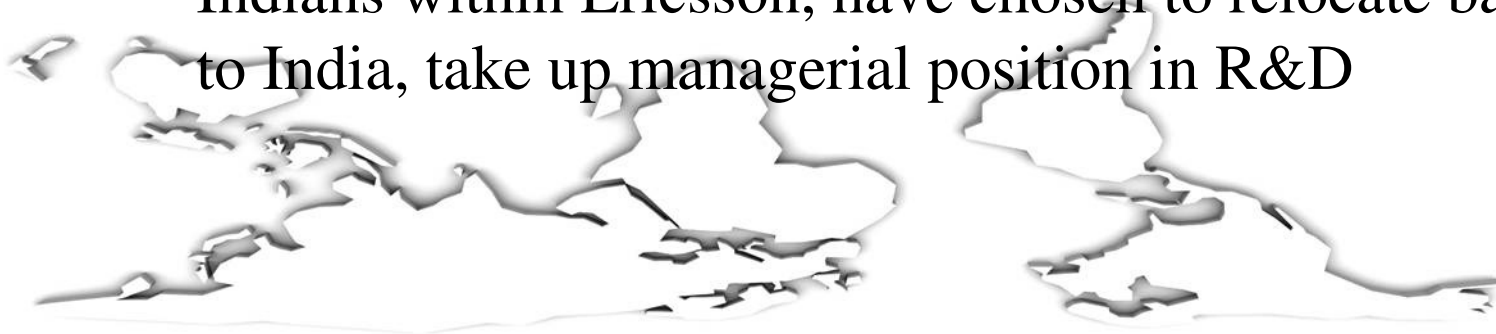
## Manage Talent Pool Globally

- Look for best possible FIT, Find the most suitable person somewhere, Bring him wherever the location
- Minimise utilising non-Indian workforce in India

But

- For certain leadership position
- For certain technical position during build up

Indians within Ericsson, have chosen to relocate back to India, take up managerial position in R&D



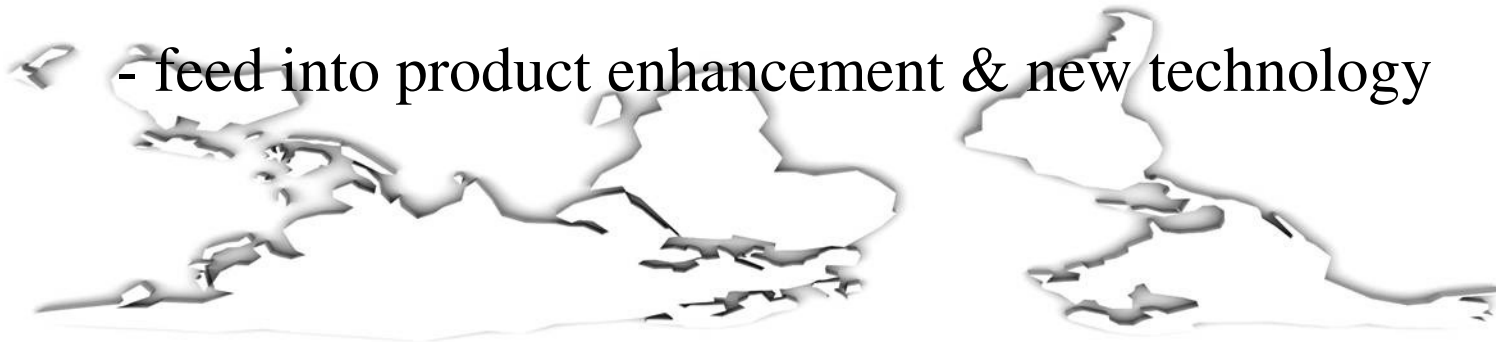


# External Networks

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## Key strategy for India to do the work in-house

- Ericsson strategy when it comes to **Research**
  - to **collaborate with universities**, give assignments
  - Staff interacting with universities.
  - Internal staff level, very little research, as most of the staff is actually coming from universities.
  - Most of this work is done by the universities themselves
  - IIT Madras, IIT Delhi, Anna university
  - feed into product enhancement & new technology





## Management & Organisation of R&D

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### 6. External networks - R&D centre China

- Cooperate with many Universities, Research Institute  
- Tsinghua University, Southeast University in Nanjing, Beijing University of Posts & Telecommunications.
- Sponsor University research, research projects for Ericsson.
- Collaboration are **both global and local**





# Management & Organisation of R&D

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## Aligning objectives –HQ with R&D centre

- Organisational objectives are direct mirror of India
- One to one alignment
- Top down & Bottom up approach- Target, objective setting

## Autonomy

- Complete autonomy in running day to day operations
- Strategic decisions such as budgeting, headcount happen at HQ & are handed down
- Within given constraints it has complete autonomy





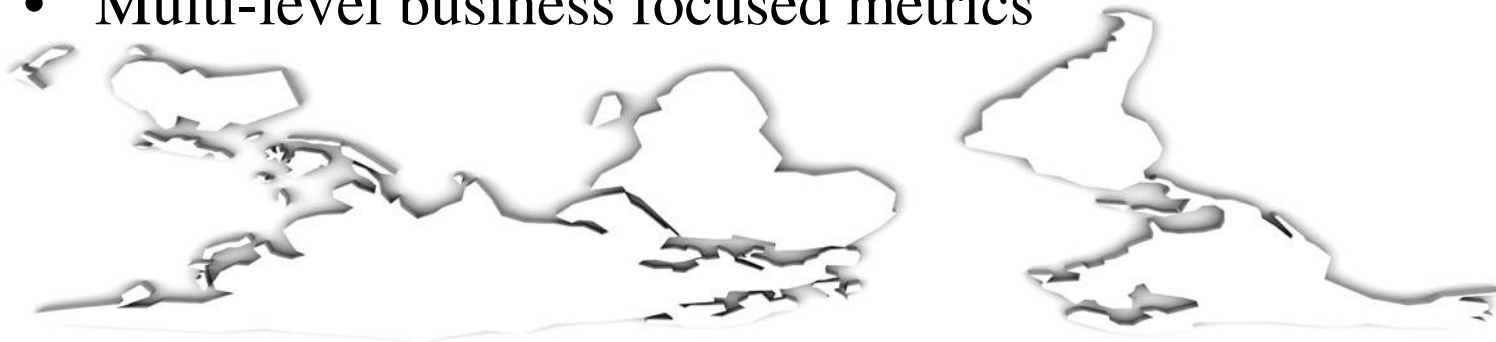
## Strategies for successful global R&D Organisation & Management

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‘Despite the risks, pitfalls- triple benefits.....’

- shorter time-to-market, lower costs, better products’

- People management structures accommodating cultural & behavioural differences with effective communication channels
- Operational efficiencies through
  - modular architecture,
  - clear governance rules,
  - IT systems designed for collaboration.
- Multi-level business focused metrics







# Strategies for successful global R&D Organisation & Management

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- Place End-to End Product Mandate
- project responsibility only in this location, not done anywhere else
- Global Talent Management, expatriates in senior roles
- Minimise utilising non-local workforce
- One to one alignment, top-down & bottom-up





# Strategies for successful global R&D Organisation & Management

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- In the case of products/solution with global mandate
  - Develop standardised products
  - that are applicable to global market
  - through collaborating with standardization bodies, industry global suppliers, global service providers
- In the case of localisation
  - Modularity of components also allows to react flexibly to the different local demands
  - Faster local responsiveness





**Thanks for your attention/questions**

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