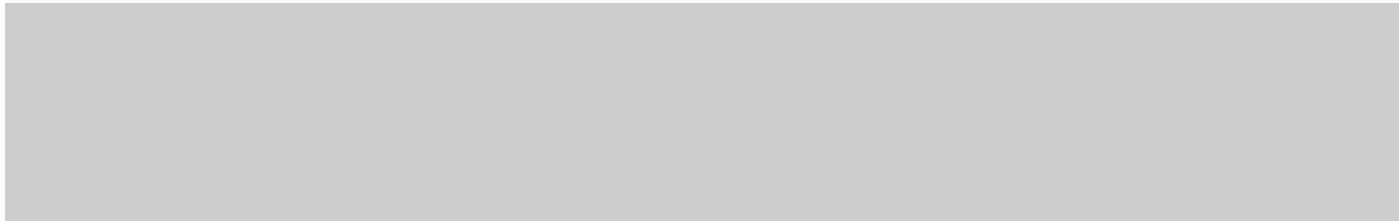
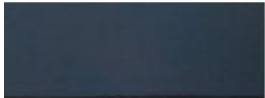




June 21st 2011

Innovation in China

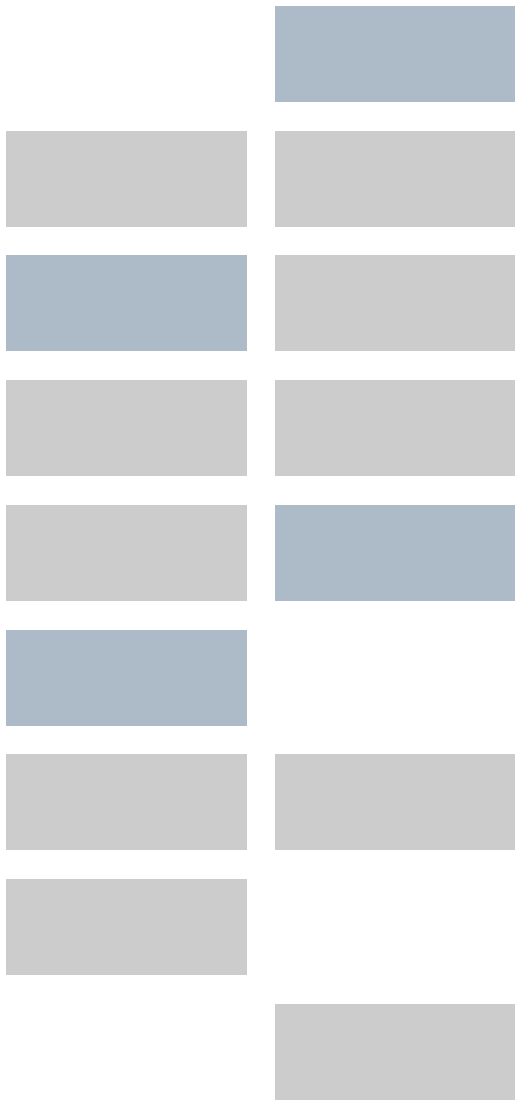
PLM BEST PRACTICE CONFERENCE 2011



PRTM

*Management
Consultants*

Where Innovation Operates



Case Study 1 – Platforming

A MAJOR HOME APPLIANCES MANUFACTURER

Background and Objectives

Company is a leading home appliances manufacturer in China. In the past 20 years, company export business has grown to include over 7 product families and over 20,000 models. Eighty percent of the export business is ODM-based.

- Leader in China
- Top 10 globally

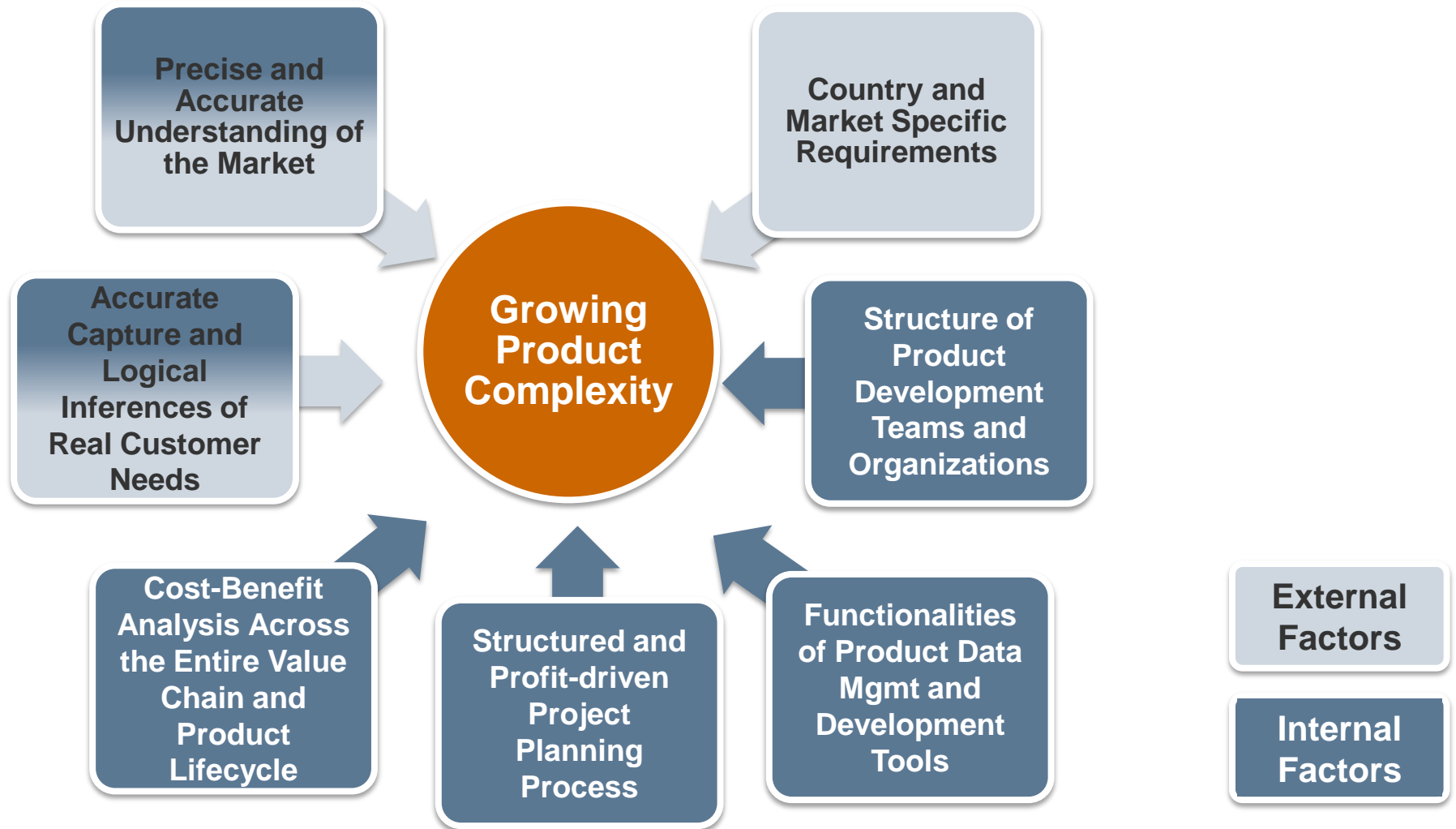
Company faced a number of challenges:

- Lack of product standardization and platforming practice
- Large number of models (20,000+) and parts (500,000+), and increasing over 20% annually
- IT infrastructure was behind the needs of business operations

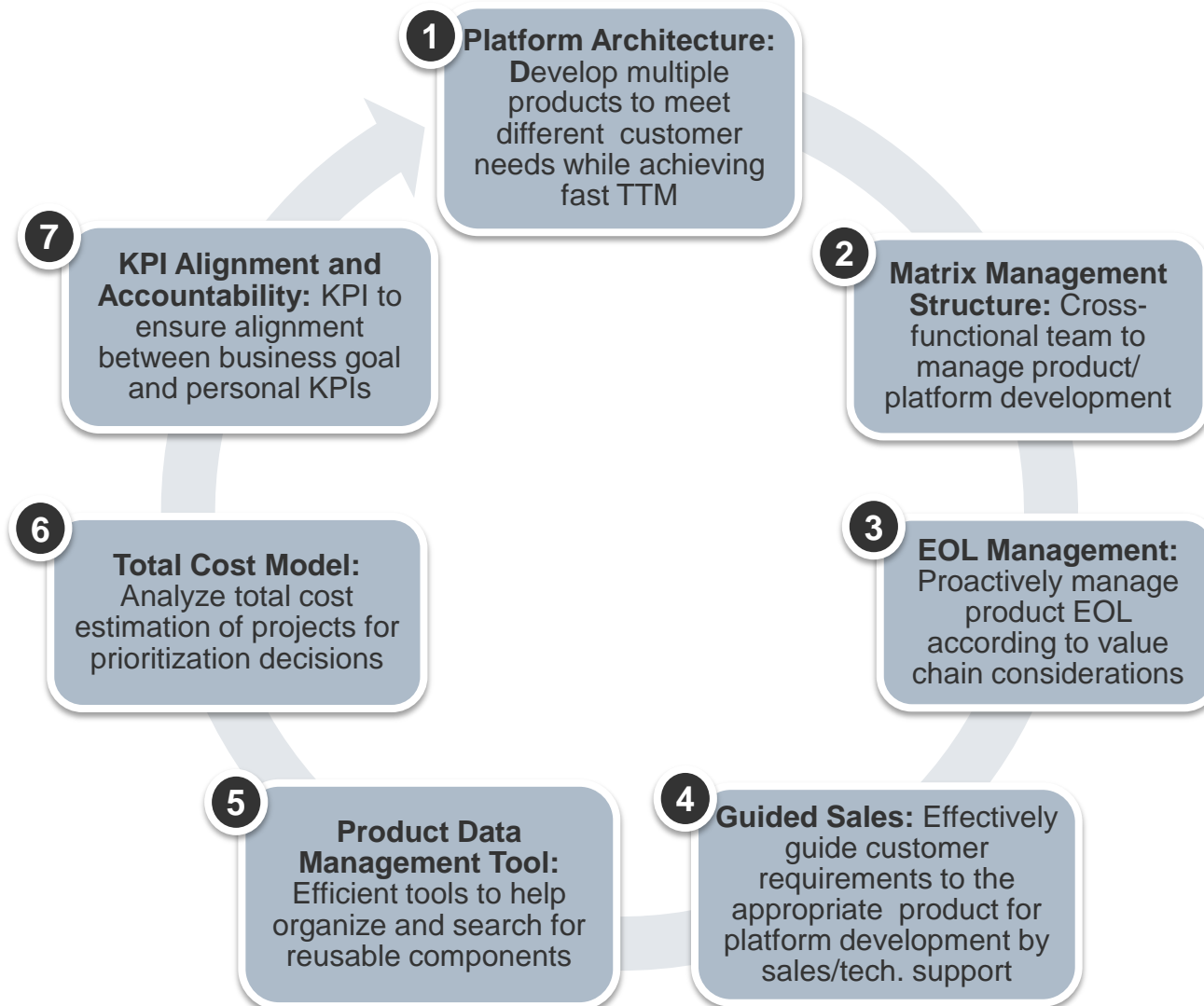
Overall project objective was to reduce complexity through product platforming, modularity and parts parameterization to achieve significant improvements in:

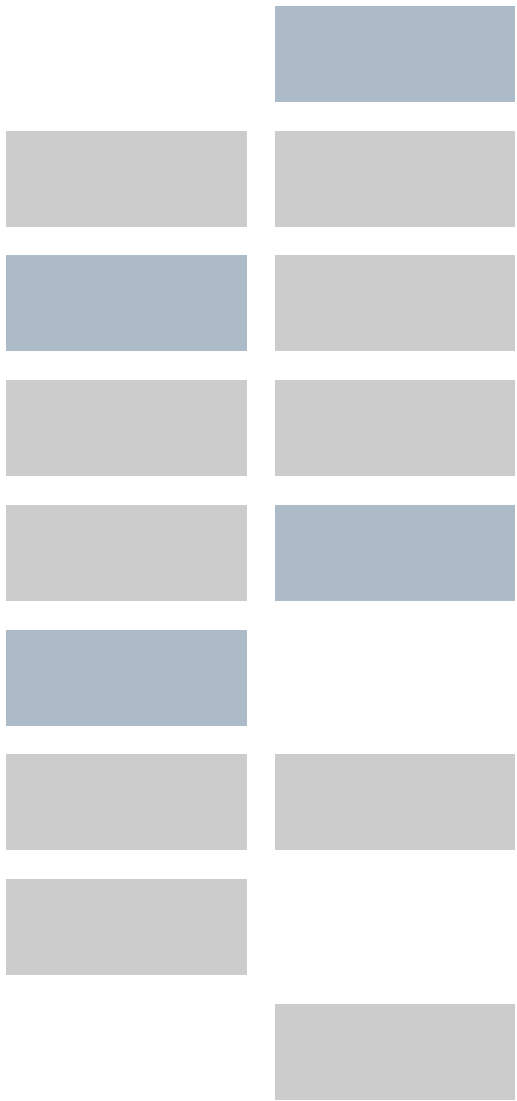
- Time-to-market reduction
- Reduction of number of models and parts
- Increased parts commonality and reuse

Product Complexity Resulted in Redundant Cost and TTM Delays – Root Causes Came from Various Sources



PRTM Recommended a 7-Step Approach to Reduce Overall Product Complexity





Platform Architecture Design

Platforms Yield Derivative Products That Are Quickly Tailored to Meet Regional Requirements

Geographic Region

North America

Product 4B

Product 4A

Products built from Platforms can cover regional market requirements

Europe

Product 2

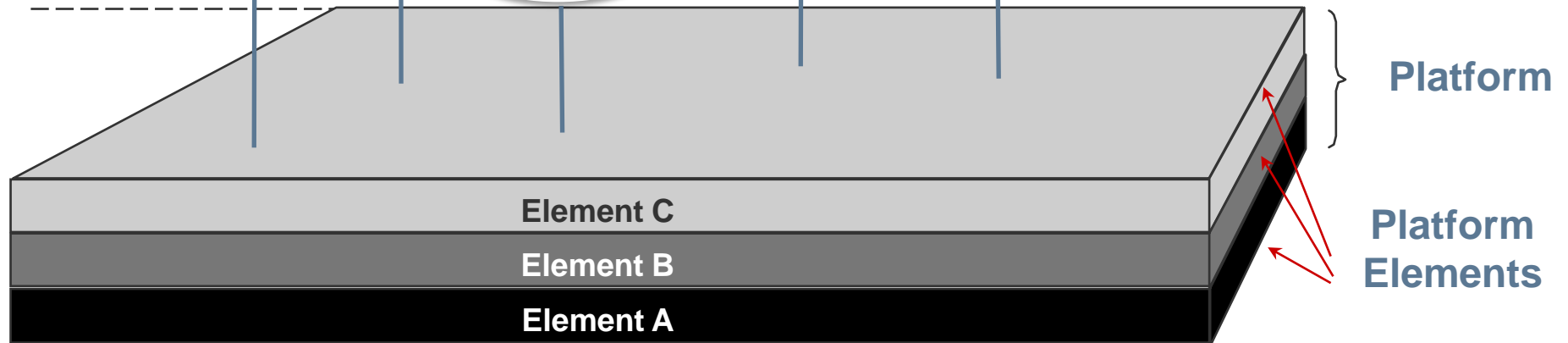
Africa

Product 1

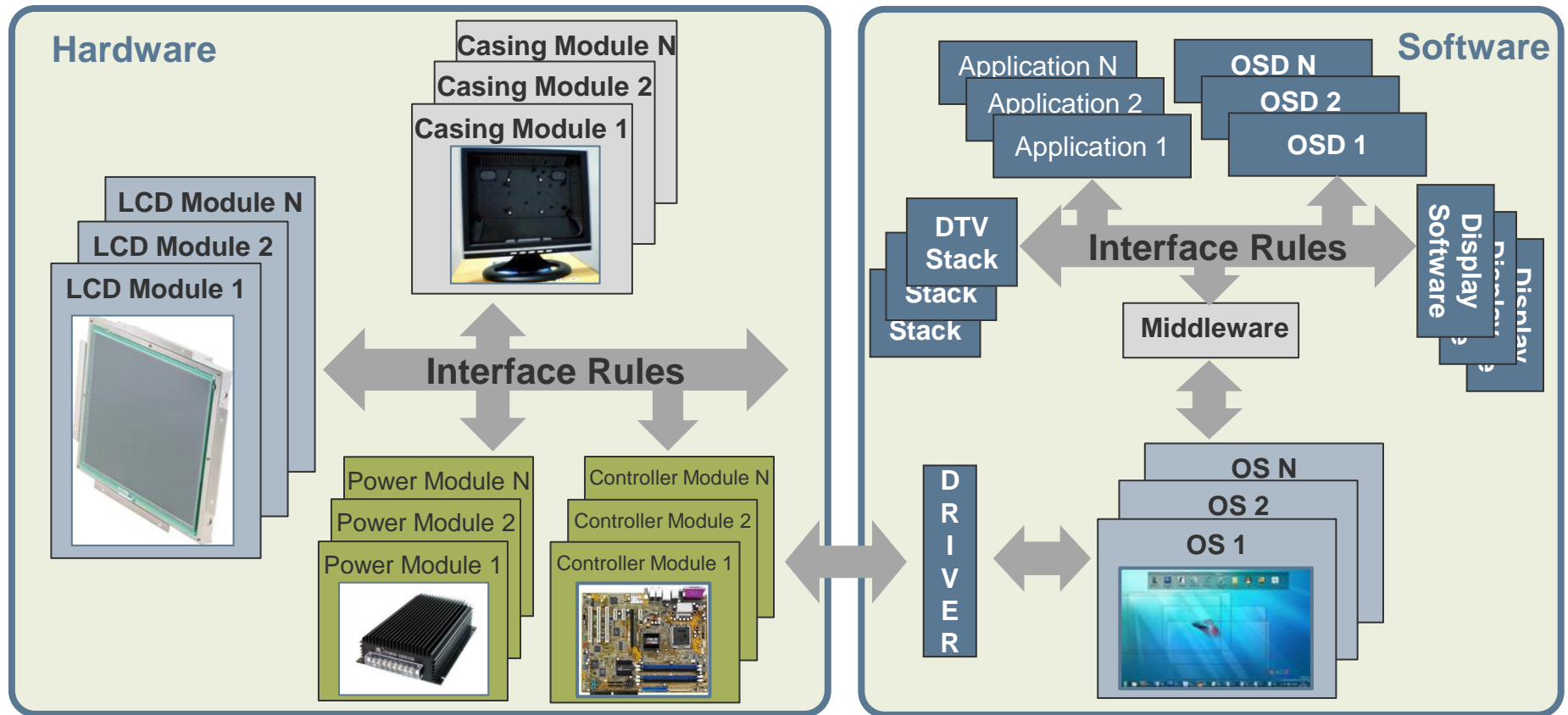
Product 5

Asia/Pacific

Product 3



Platform is a Combination of Different Hardware and Software Components Connected Through Interface Rules



Product Series 1

Product 1A

- LCD Module 1
- Power Module 1
- Casing Module 1
- OS 1
- Application 1
- OSD 1

Product 1B

- LCD Module 2
- Power Module 1
- Casing Module 2
- OS 1
- Application 1
- OSD 1

Product 1C

- LCD Module 3
- Power Module 2
- Casing Module 3
- OS 1
- Application 1
- OSD 1

Platform Elements Are Monitored and Updated so They Can be Leveraged by Platforms to Deliver Competitive Products

Focus on platform development to standardize platform modules and reduce TTM

Product Development

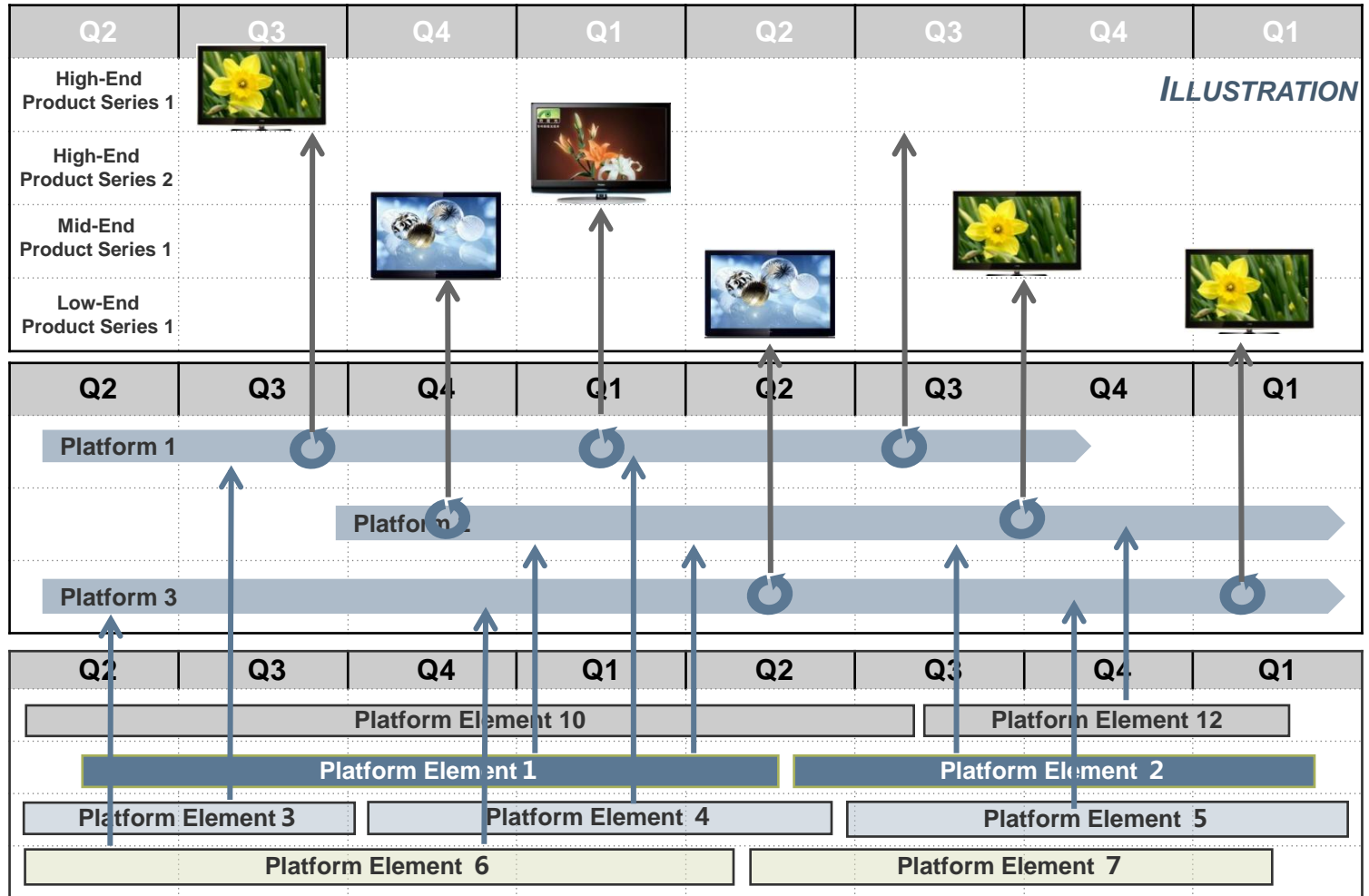
- Plan product roadmap based on market requirements
- Leverage platform to develop product families that targets different market segments
- Flexible and agile development to deliver products to market

Platform Roadmap

- Continual update of product platform to incorporate latest features, technologies to maintain product competitiveness

Platform Element Development & Maintenance

- Update platform elements to make them available for product platform update
- Modularized design to leverage purchasing and optimize supply chain costs



Modularity and Standard Interface are Two Key Principles of Product Platforming

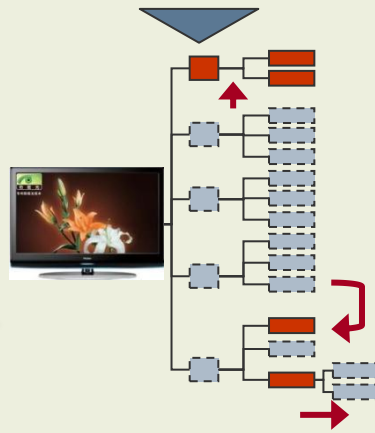
ILLUSTRATION

Modularity

Modularization: Defines the relationship between platform elements and product features

Platform Structure Reference Checklist

Check List
Group together following portions in the architecture
Portions related to a function/performance
Portions that need fine tuning in relative location to each other
Separate following portions from the rest in the architecture
Portions related to product evolution
Portions related to product diversification
Portions that have uncertainty in specification
Portions that can be used in other product groups
Separate portions by development entities
Examine the architecture from the following perspective
Design For Assembly
Design For Serviceability
Design For Cost
Design For Test perspective



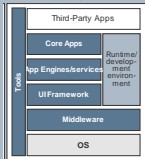
Hardware

Software

System



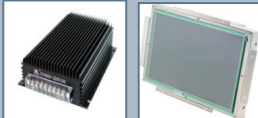
Software Architecture



Elements



Middleware



Components



Applications

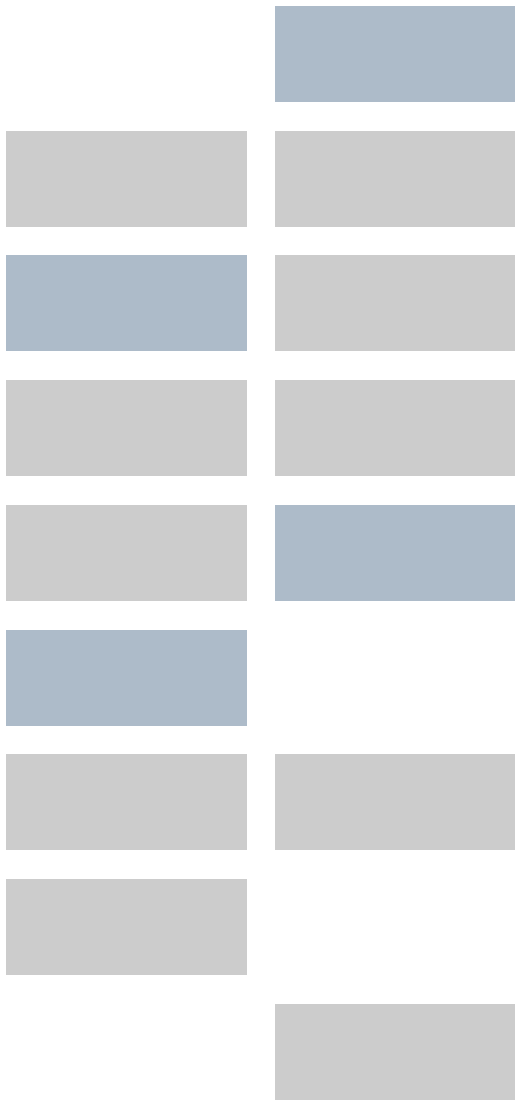
ILLUSTRATION

Standard Interface

Interface Standardization: Defines how platform elements interact and interface with one other, including both logical interface and physical connections

System / Element	Logical Interface			Physical Interface
	DC	AC	Protocol	
System	X	V	V	V
Casing	X	X	X	V
LCD Module	V	V	V	V
Power Module	V	V	X	V
Control Module	V	V	V	V
OS	X	X	V	X
Middleware	X	X	V	X
DTV Station	X	X	V	X
Applications	X	X	V	X
Drivers	X	X	V	X

V: Relevant X: Irrelevant



Overall Platforming Benefits

Results and Benefits:

Reduction of Part and Interface Complexity via Platforming

Module Type	Status Quo	After Platforming	% Reduction
Module 1	15	3	80%
Module 2	123	12	90%
Module 3	15	4	73%
Module 4	15	6	60%
Module 5	20	4	80%
Module 6	31	6	81%
Module 7	34	6	82%
Module 8	58	3	95%
Module 9	39	6	85%
Module 10	41	3	93%

Interface Type	Status Quo	After Platforming	% Reduction
Component A Interface	63	3	95%
Component B Interface	36	1	97%
Component C Interface	83	10	88%
Component D Interface	>50	4	92%
Component E Interface	38	16	58%
Component F Interface	>50	16	68%
Component G Interface	40	10	75%
Component H Interface	40	10	75%
Component I Interface	142	52	63%
Component J Interface	14	6	57%
Component K Interface	32	20	38%

Platforming Allows Product Development to be More Productive and Structured, This Drives Higher Business Performance and KPIs Improvements

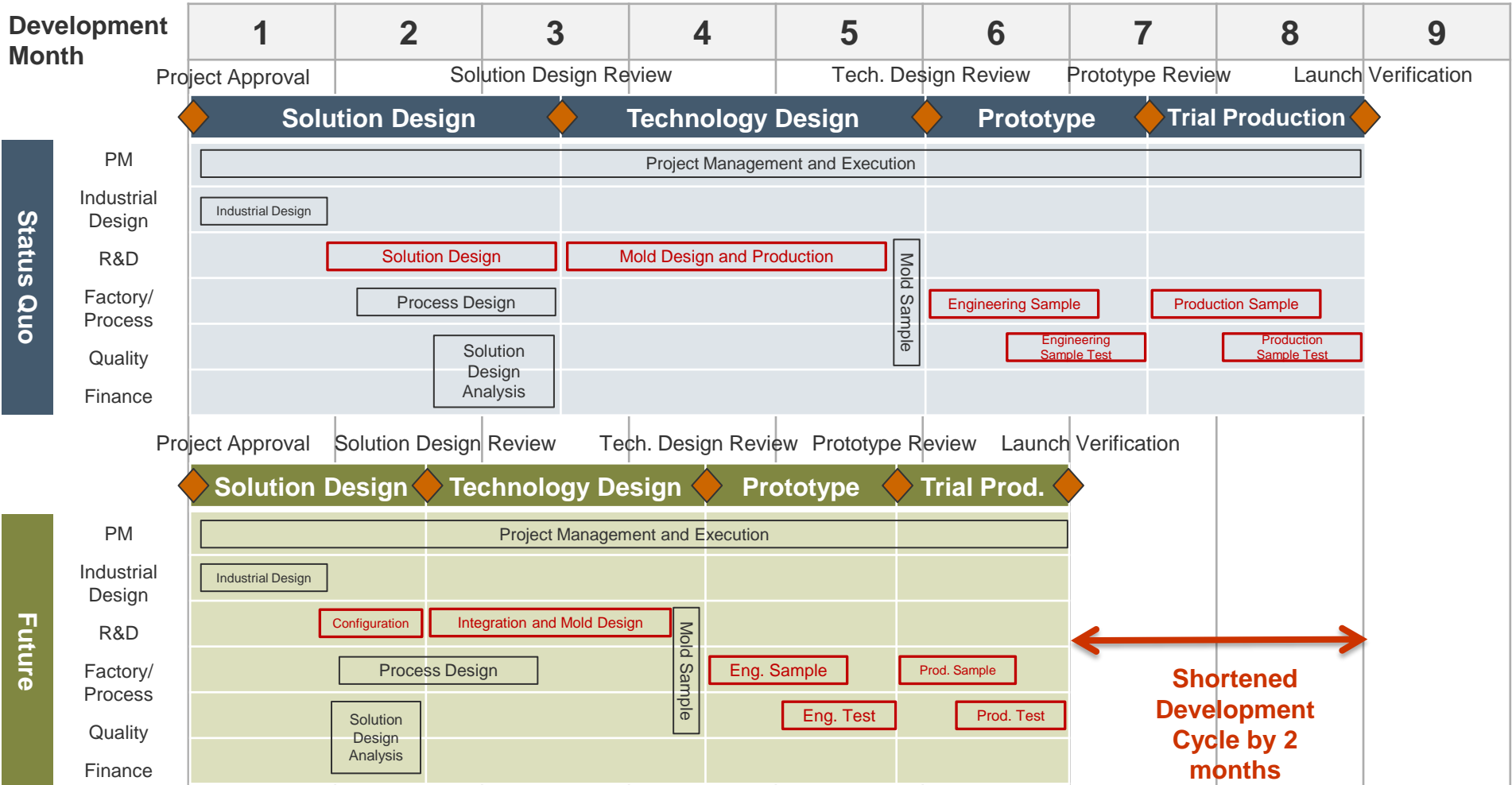
Reduce product development time
 Increase component leverage
 Reduce total components/parts used
 Increase R&D productivity



Faster Time-to-Market → **Higher Sales**
 Lower production complexity → **Higher Efficiency**
 Lower supply chain complexity → **Lower Costs**
 High model output → **Higher Market Share**

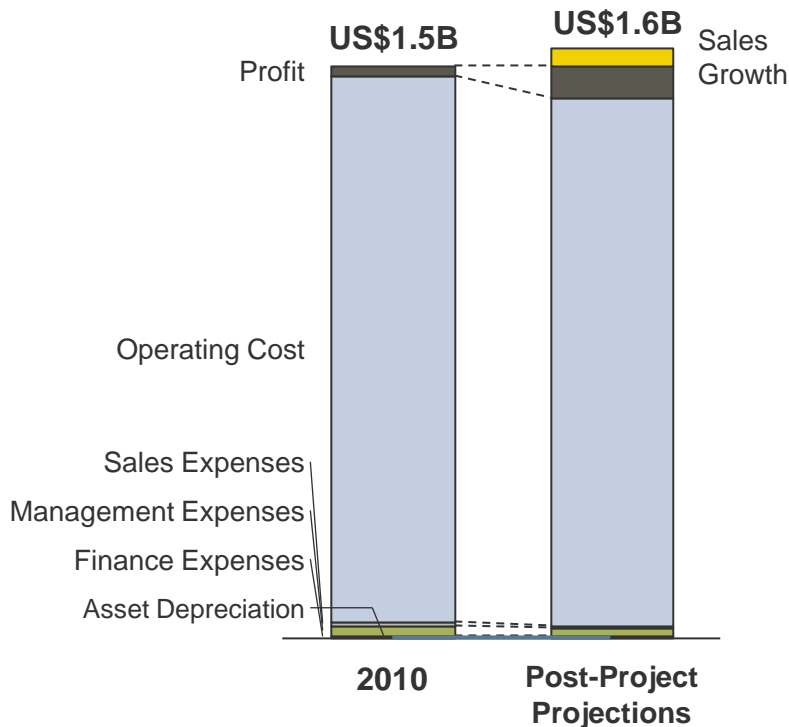
Results and Benefits:

Time-to-Market was Reduced by 25% Through Platforming



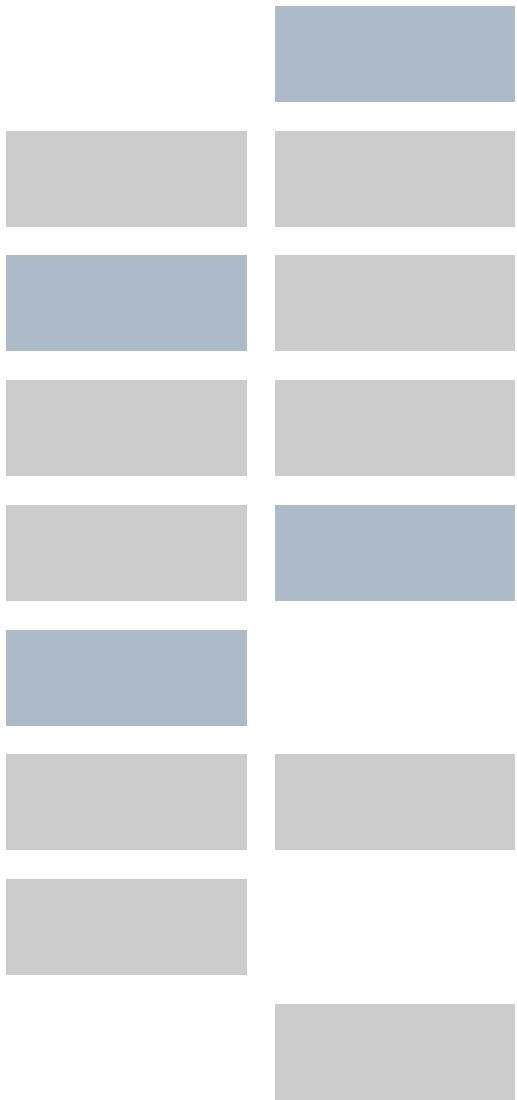
Key Improvement Areas
Thru Platform Leverage

PRTM Helped Client Realize nearly US\$60M in Potential Benefits Through Platforming and Component Standardization



Cost Item	Impact	Benefit
Sales Growth Profit*	Reduce time-to-market and increase market share capture	\$3M
Operating Cost	Reduce labor and direct material cost (component rationalization and purchase volume leverage)	\$45M
Sales Expenses	Reduce cost for post-sales support thru reduced spare parts requirements	\$2M
Management Expenses	Lower product support cost and supply chain related costs through product platforming and component standardization	\$8M

Total Potential Benefits = \$58M



Takeaways

Key Success Factors

Cross-Functional Initiative

- Improved cross-functional project based financial decision making
- Improved collaboration of sales, Prod Planning , Ops, Fin and R&D
- Cross functional and closed loop KPI performance
- Active end-of-life management and model pruning

Disciplined Behavior

- Enforcement of engineering practices and data management
- Rightsizing processes and enforcing process compliance
- Enforcement of tying performance outcomes and incentives

Long Journey

- The journey will be long - 24 to 48 months
- Focus is key, Company can only handle so much at one time
- The end-point is beyond what has been defined

Transformation From Reactive to Proactive

- Ability to shape customer needs to optimize revenue and profit
- Ability to understand market requirements and translate to products
- Ability to understand end-user requirements and steer customers

Systems Enabled

- Foundational PDM system to facilitate design re-use
- Tools to support guided selling
- Total cost management tools to support financial decision making

Key Takeaways

ODM vs. OEM

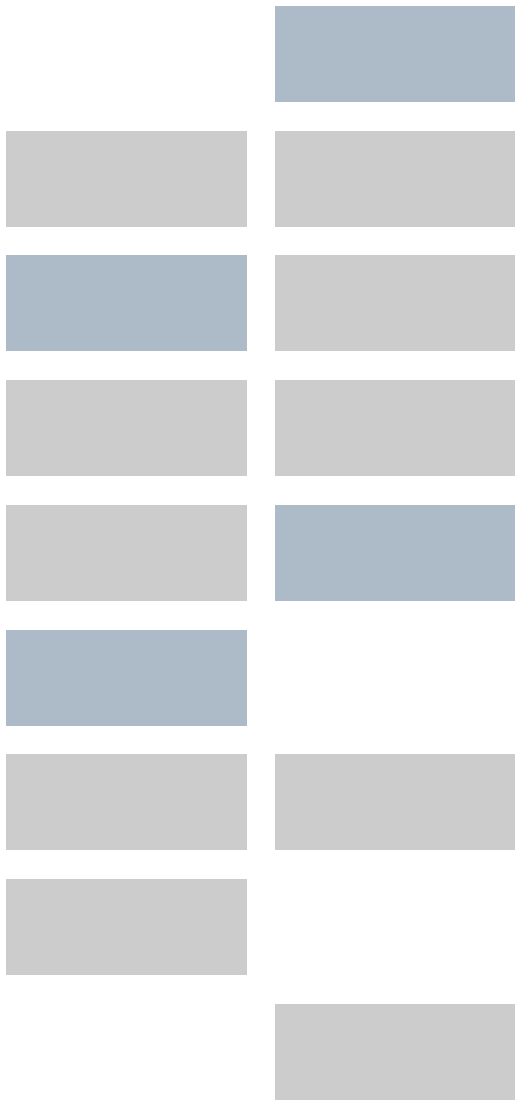
- Client's export business is ODM-based; therefore, platform architecture design needs to reserve flexibility to accommodate business model: e.g., focus on standardization of interfaces on customer specific parts, but not compromising creativity in industrial design or appearance

Project Challenges:

- Getting cross functions to work together in a very functional-minded organization: linking their KPIs to the project outcome, getting strong client program manager, adopting hand-holding facilitation, etc.
- Prioritized project recommendation and tackled on what could be achieved; made sales related improvements separate
- Platforming is just the beginning; major investment is needed to realize the product platform

In summary, a transformation like this will enable Chinese players to compete much better globally through reduced time to market, product complexity, supply chain overhead and manufacturing cost, and higher revenue growth

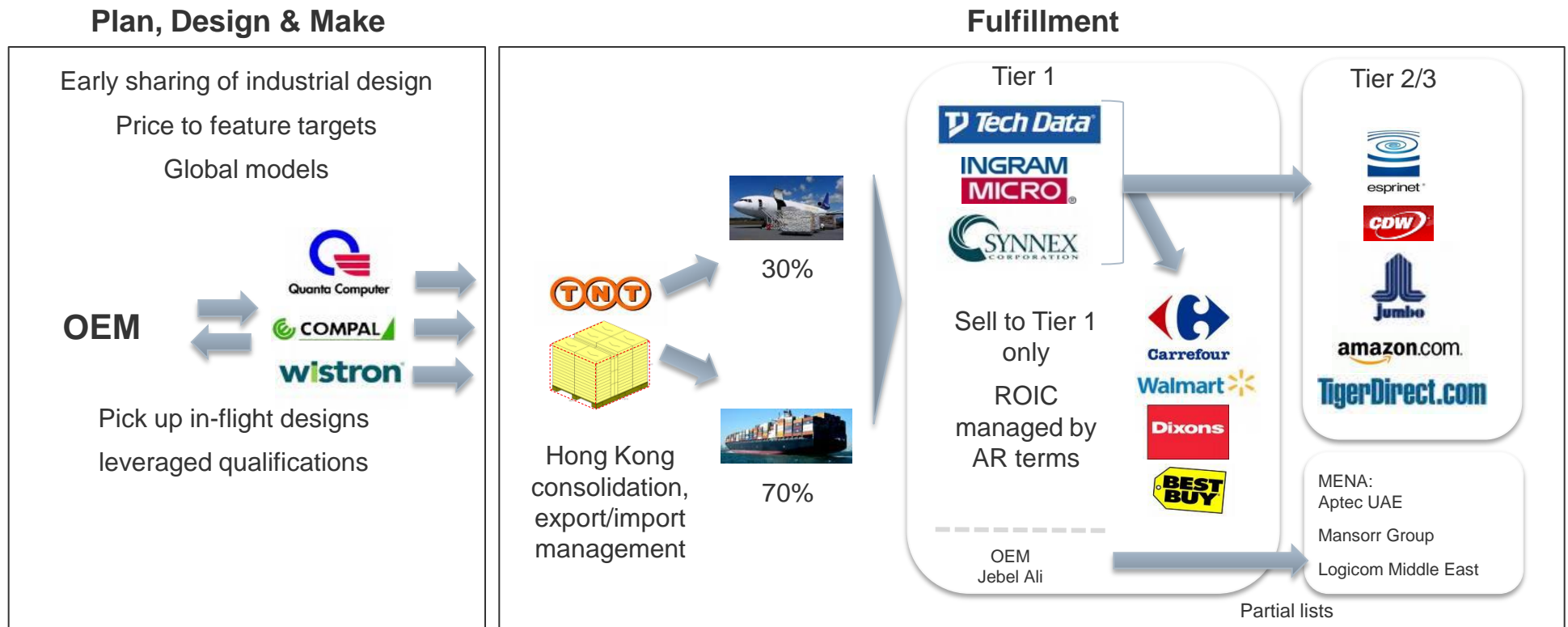
The gap between Chinese and global players is around 5 years and the Chinese are bridging the gap quickly



Case Study 2 – ODM

A MAJOR ELECTRONICS DEVICE MANUFACTURER

Top Electronics Device Manufacturer – Uses a Lean, Low Cost Business Model



ODM TTM focus: Close fit in-flight designs and late BOM lock support

High use of ocean freight: blend based on point of lifecycle

Tier 1 distributors own/stock inventory: end of OEM's supply chain

Operating Model Exhibits A Number Of Unique Attributes And Practices – *Plan, Design and Make*

Plan, Design & Make

Early sharing of industrial design

Price to feature targets

Global models

OEM

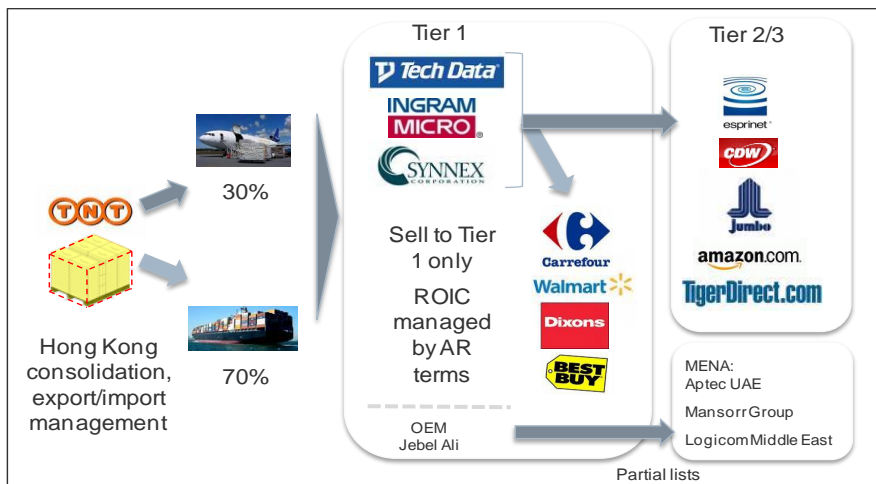


Pick up in-flight designs

leveraged qualifications

- Conduct rapid analysis of market movements, followed by quick component/sub-assembly substitution
- No traditional roadmaps; do industrial designs and set desired price / feature only
 - Significant reliance on ODM and partners for design and testing
 - Common chassis and simplified motherboard to accommodate multiple peripherals like HDD, Monitor, etc.
 - ODMs show in-flight models that meet industrial design guideline
- Near-ready designs sourced from ODM partners through competitive RFQs
 - Three ODM partners compete with their latest technologies
- Leverage competitors for component qualification (no need to qualify for competitor OEM qualified part)
- Use limited configurations on global platforms
- Rapid, streamlined decisions at top of brand organization

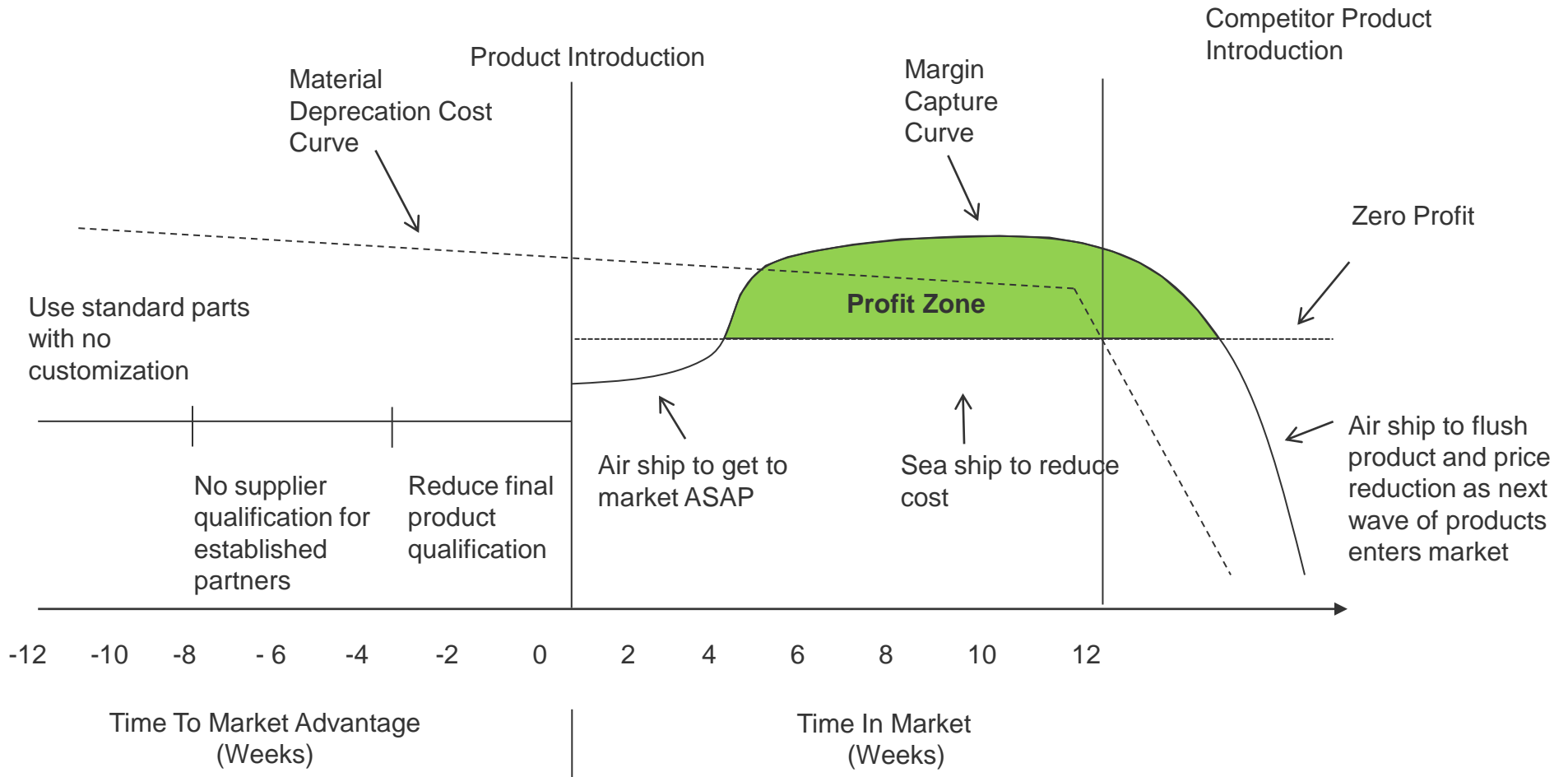
Operating Model Exhibits A Number Of Unique Attributes And Practices – *Fulfillment*



- BOM locked late to get the best ‘bang for buck’ product
- ~70% ocean freight for notebooks; ~30% air
- Align ODMs for short cut in lead time for new assemblies: common metrics and SLAs
- Base spares volume and terms negotiated at time of new volume negotiation; Warranty terms aligned to affordability
- Compensation through up-front simple margin pricing model: limited rebates or special sales incentives and limited use of promotions and special discounts
- Push inventory model: large order quantities already localized shipped via ocean into tightly integrated distributor logistics provider
- Tie up distributors with OEM volumes so that competitors are the second choice

Time To Market Performance Represents A Significant Profit Advantage

PC example



Key Takeaways

- **Operating model must fit well with the business model and strategy**
- **Take advantage of working with multiple ODMs to gain their in-flight design capabilities**
- **Allow company to focus on brand, fashion and marketing of products**
- **Evolve operating model as business strategy change to ensure high value position in market place**
- **In summary, Chinese players are evolving their roles in the value chain to maximally exploit their geographical and cost potentials**