

# Smart Connected Products: The Industry Perspective

Kartik Palani



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# *The IT Revolutions*

- Automating individual activities
- Rise of the internet
- Smart Connected Products

# What are they?

- Physical Components
- Smart Components
- Connectivity Components



# *Why the Industry Cares?*

- Customer behavior patterns
- Customer UX
- Productivity gains
- Reduce costs
- 
- Emerging Opportunities

## Identity and Security

Tools that manage user authentication and system access, as well as secure the product, connectivity, and product cloud layers

## PRODUCT CLOUD

### Smart Product Applications

Software applications running on remote servers that manage the monitoring, control, optimization, and autonomous operation of product functions

### Rules/Analytics Engine

The rules, business logic, and big data analytical capabilities that populate the algorithms involved in product operation and reveal new product insights

### Application Platform

An application development and execution environment enabling the rapid creation of smart, connected business applications using data access, visualization, and run-time tools

### Product Data Database

A big-data database system that enables aggregation, normalization, and management of real-time and historical product data

## CONNECTIVITY

### Network Communication

The protocols that enable communications between the product and the cloud

## PRODUCT

### Product Software

An embedded operating system, onboard software applications, an enhanced user interface, and product control components

### Product Hardware

Embedded sensors, processors, and a connectivity port/antenna that supplement traditional mechanical and electrical components

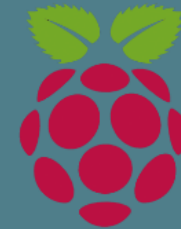
## External Information Sources

A gateway for information from external sources—such as weather, traffic, commodity and energy prices, social media, and geo-mapping—that informs product capabilities

## Integration with Business Systems

Tools that integrate data from smart, connected products with core enterprise business systems such as ERP, CRM, and PLM

# The Product Hardware



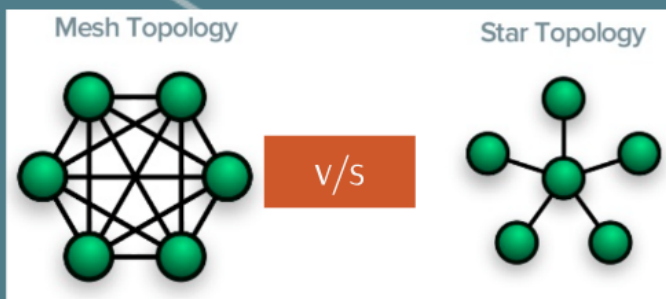
# *The Product Software*



**Contiki**



# Network Connectivity



# *The Product Cloud*



mongoDB

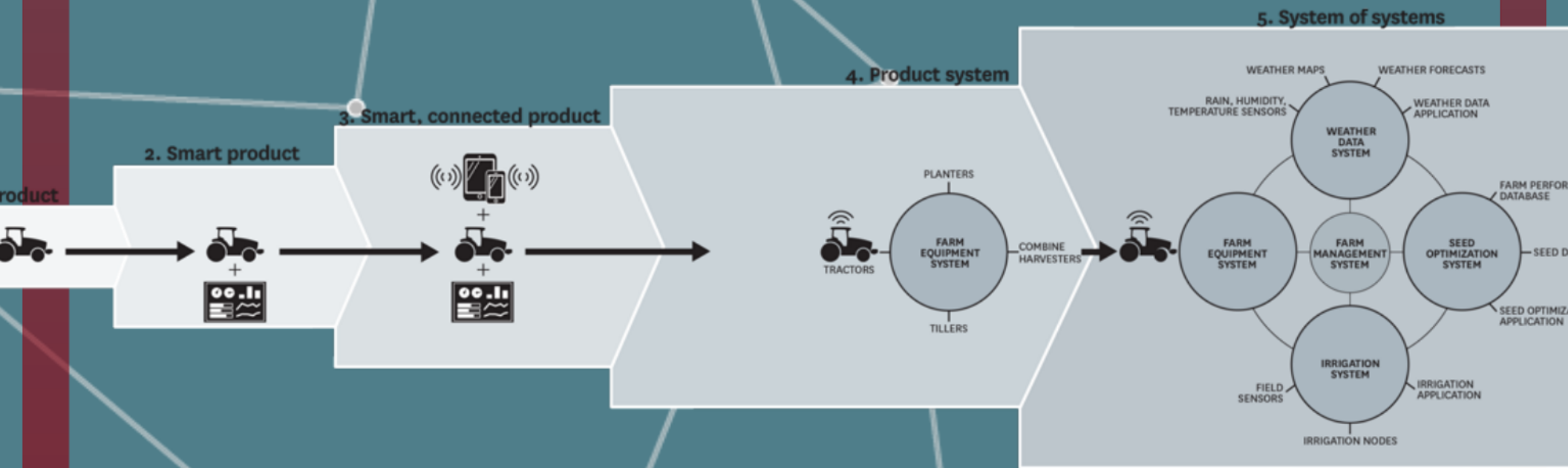
xively



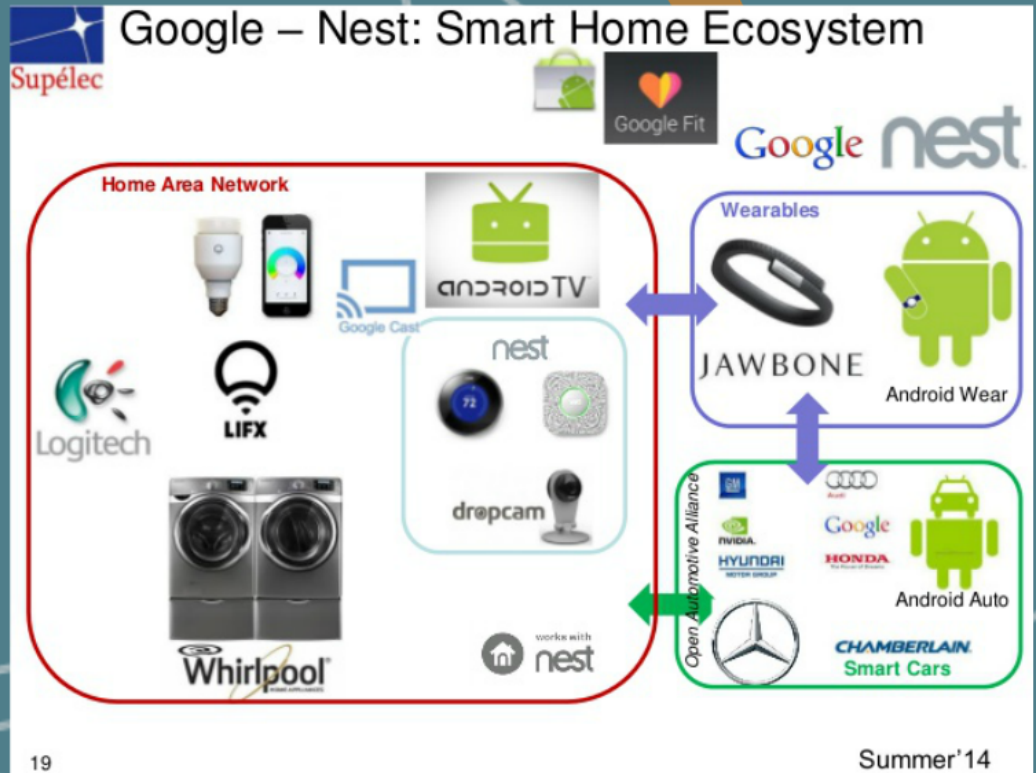
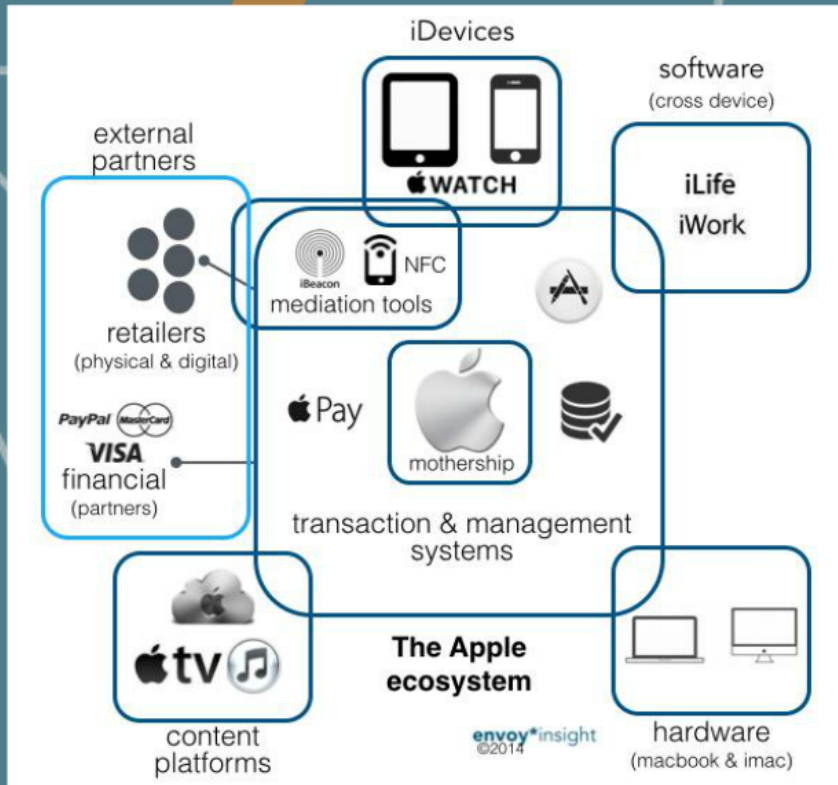
# ***How Do We Make Money?***

- Sell the physical product
- Sell the data in the product cloud
- Sell a service

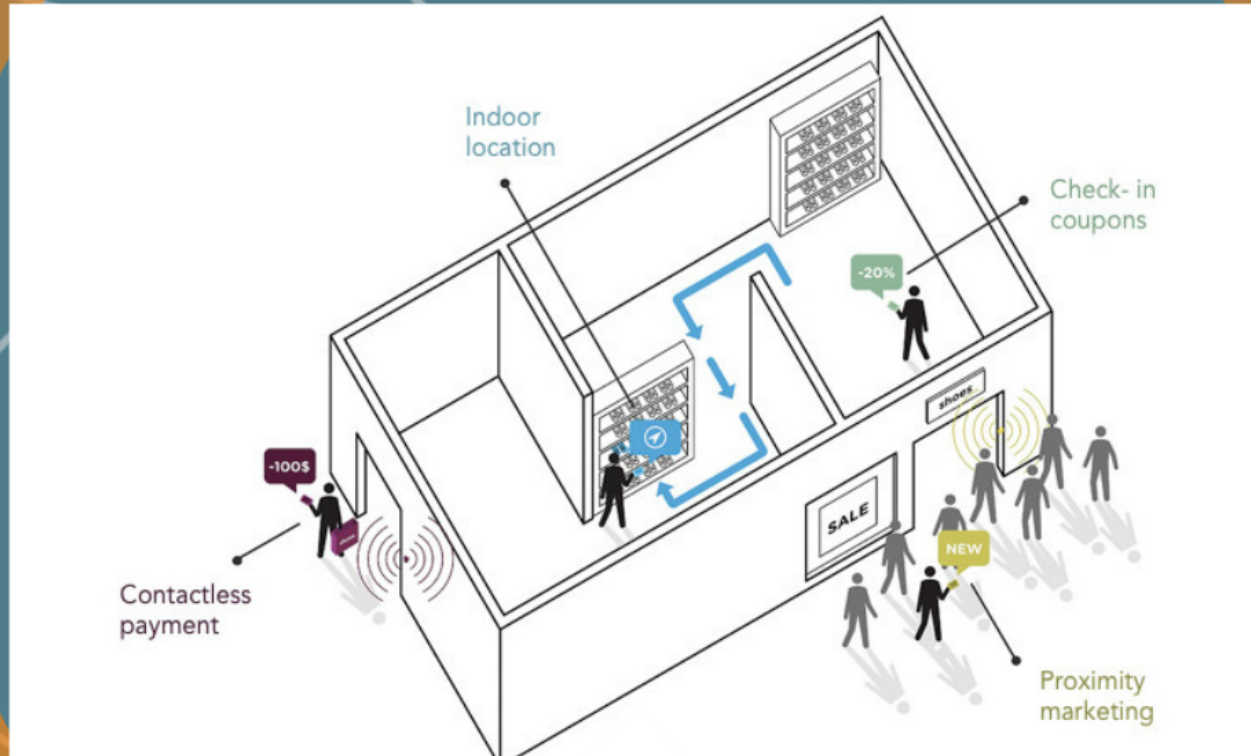
# The Industrial Ecosystem



# The Home Products Ecosystem



# The Retail Ecosystem



# Manufacturing Ecosystem



## Internet of Things in Manufacturing



### MANUFACTURING PLANT

Monitor production flow in near-real time to eliminate waste and unnecessary work in process inventory.

Manage equipment remotely, using temperature limits and other settings to conserve energy and reduce costs.

Implement condition-based maintenance alerts to eliminate machine down-time and increase throughput.

Aggregate product data, customer sentiment, and other third-party syndicated data to identify and correct quality issues.

### GLOBAL FACILITY INSIGHT



### CUSTOMER SITE

Transmits operational information to the partner (e.g. OEM) and to field service engineers for remote process automation and optimization.

Provide cross-channel visibility into inventories to optimize supply and reduce shared costs in the value chain.



### GLOBAL OPERATIONS



I can see my production line status and recommend adjustments to better manage operational cost.



I gain insight into usage patterns from multiple customers and track equipment deterioration, enabling me to reengineer products for better performance.



I know when to deploy the right resources for predictive maintenance to minimize equipment failures and reduce service cost.



### THIRD-PARTY LOGISTICS

# The Big Challenges

I ♥ low battery





*Let's Play!*



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