



What Are OEM Product-Services?

OPI Focus

To provide education, market research and management consulting services that assist capital goods OEMs to evolve into suppliers of Product-Services

“Product-Services fuel powerful growth in your company and transforms its culture and its soul”

-Jack Welch

OPI

PO Box 48

Lewisburg, PA 17837

Voice: 570.523.0992

Fax: 570.523.9509

OEMservices@aol.com

www.oemservices.org

Executive Director:

Ron Giuntini

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“Capital good OEM crafted services that supply solutions to operators for managing the productivity of a product ”

OPI Definition of Product-Services

The objective of this white paper is to deliver a body of knowledge that enables capital goods OEM executives to understand the concept of Product-Services.

OEMs currently focus on marketing a single Product-Services offering (average 85% of revenues);
New-condition product sale.

The OPI believes that when OEMs strategically focus their business model on supplying a large variety of Product-Services, they will experience:

- Faster organic revenue growth
- Higher profit margins
- Greater customer loyalty

“The task is, not so much to see what no one has seen, but to think what nobody has yet thought, about which everybody sees.”

-Eric Schrodinger

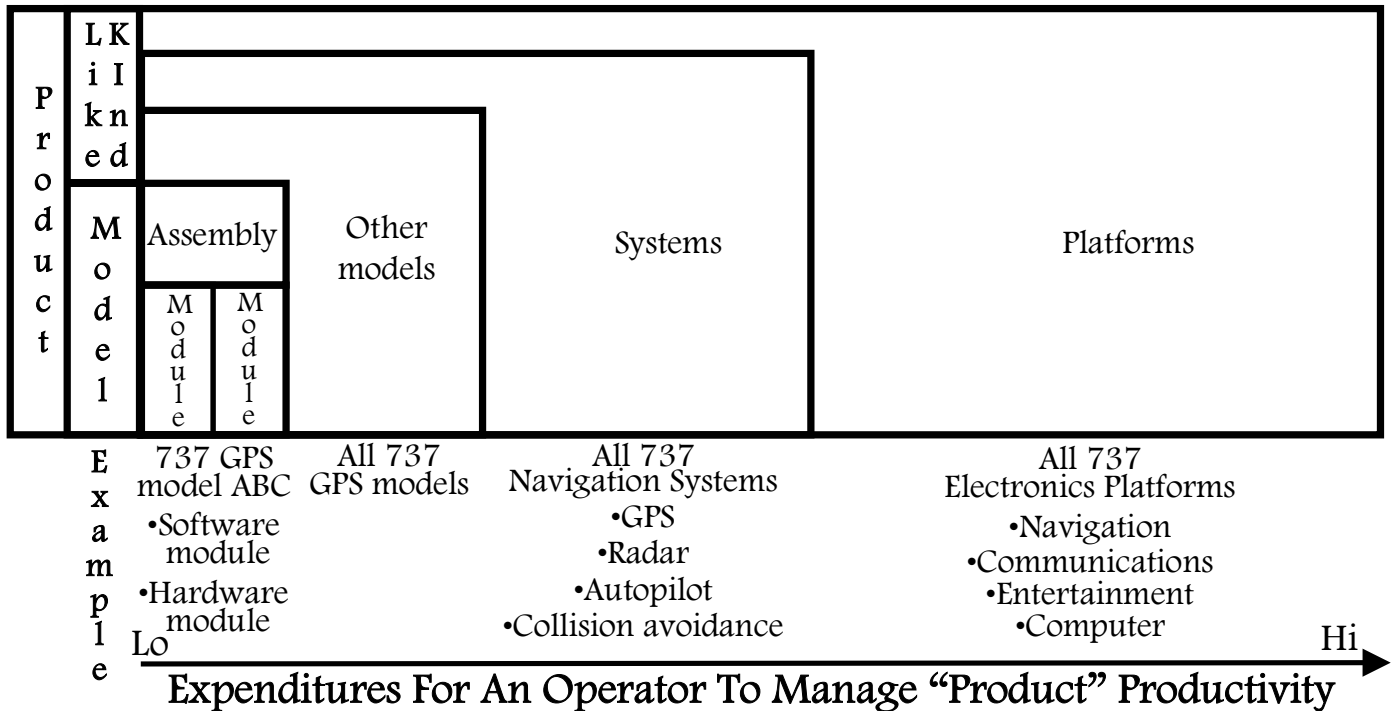
Who Are Capital Good OEMs (Original Equipment Manufacturers)?

Sector	Major US OEM	Sector	Major US OEM
Construction	Caterpillar, Terex	Multi-sector Components	ITT Industries, Flowserve
DataVoiceNetworks	Cisco, Lucent	Multi-sector Instruments	Agilent, Perkin Elmers
Diversified	GE, Honeywell	Office	Xerox, HP
Entertainment	Int. Gaming, GTech	OilGas	Halliburton, BakerHughes
Farm	Deere, AGCO	Specialty	Lincoln Electric, Diebold
Healthcare	Waters, Variance Medical	Transaction Capture	Symbol, Zebra
Mfg. Automation	Rockwell, Nordson	Transportation Aerospace	Boeing, Goodrich
Mfg. Design	Intergraph, Silicon Graphics	Transportation Railroad	Greenbrier, Wabtec
Mfg. Material Shaping	Milicron, Unova	Transportation Trucks	Navistar, Paccar
Mfg. Semiconductor	Applied Materials, Novellus	Others	Others

Capital Goods

Economic lifetime of at least 3 years	Focused upon favorably impacting enterprise productivity	Goods used in the creation of other goods and services (B2B)	Reflected upon a balance sheet as a fixed asset
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What Is A Product?



There are many ways a product can be defined, resulting in many different paths in crafting offerings ...and the "product" may not even be one produced by the OEM!

Who Is A Product Operator?

Product	Operator	Product	Operator
Bulldozer	Construction contractor	Barcode readers	Public warehouse
Router	Data network provider	Aircraft	Cargo airline
Slot machine	Casino	Truck cab	Trucker
Combine	Farmer	Locomotive	Railroad
MRI	Hospital	Compressor	Gas extractor
Laser metal cutter	Manufacturer	Instrument	Laboratory
Refridgerator	Food wholeseller	Drill	Oil platform operator
Printer	IT department	Turbine	Electric utility
ATM	Bank	Computer	Design Engineer
Projector	Movie theatre	Others	Others

What Is The Productivity Of A Product?

Product Productivity Metric
Output:
 Units-of-Value Delivered
 By A Product

Input:
 Net Resources Expended
 By Product Management Processes

Legend				
↑↑	↑	↔	↓	↓↓
hi increase	increase	no change	decrease	hi decrease

Output:	Input:	Productivity
↑↑	↑	↑
↑	↓	
↑	↔	
↔	↓	
↓	↓↓	
↑	↑	↔
↔	↔	
↓	↓	
↓	↑	↓
↓↓	↓	
↔	↑	
↑	↑↑	
↓	↔	

What Are The Units-of-Value Delivered By A Product?

Product	Unit-of-Value Delivered
Bulldozer	# of Tons Excavated Per Shift
Router	# of Messages Transmitted Per Minute
Slot machine	# of Plays Per Hour
Combine	# of Acres Harvested Per Hour
MRI	# of Scans Performed Per Hour
Laser metal cutter	# of Pieces Produced Per Shift
Refridgeration	# of Tons of Frozen Food Weekly Stored
Printer	# of Color Pages Printed At Desired Quality
Barcode readers	# of Error-Free Scans Per Shift
Aircraft	# of Express Packages Moved Per Trip
Truck cab	# of Ton Miles Per Trip
Others	Others

Product operators in the same industry can have different Units-Of-Values
...the difference is often driven by their business model

What Are The Resources Expended By Product Management Processes?

Product Management Processes

- Acquire product
- Control product
- Prepare product for use
- Run product
- Monitor product during use
- Maintain product configuration
- Modify product configuration
- Remove product

Resources Expended to Manage Processes

Capital Investment

- Goods
- Software
- Facilities

Current Assets

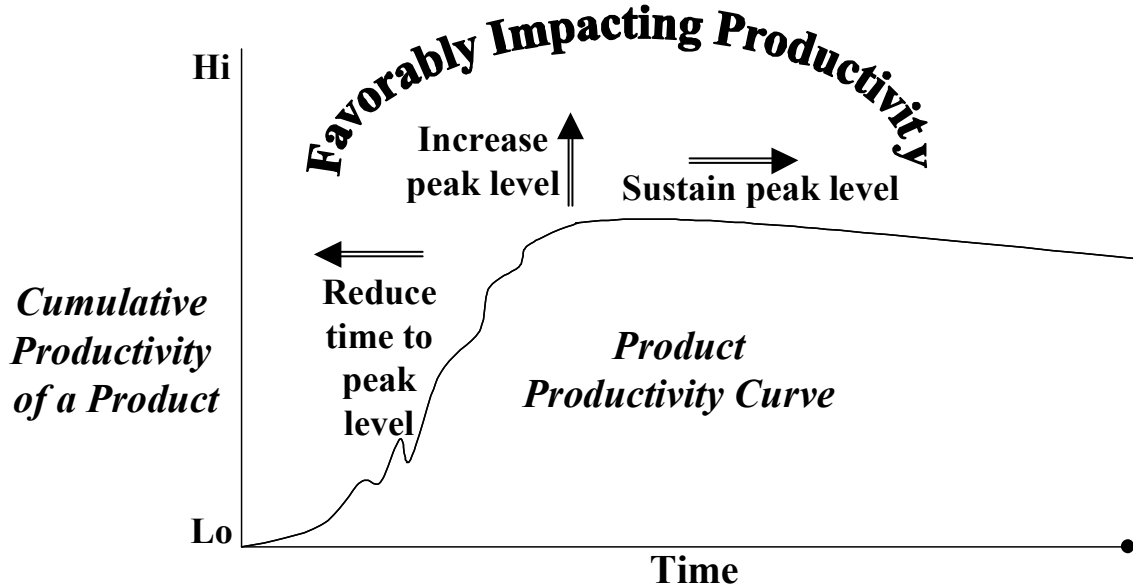
- Cash
- Inventory

Current Expenditures

- Labor
- Materials
- Energy
- Insurance
- Transport
- Others

Information

How Is The Productivity Of A Product Favorably Impacted?



There are many opportunities to favorably impact product productivity and the product lifetime ROI of an OEM, but beware of the *Product Productivity Paradox (P³)*

“If productivity rises too steeply, you can find that OEM profits are falling because there is too much capacity. Productivity can ruin you, which is what is happening in certain sectors.”

Jeremy Grantham, CMO Institutional Investors

What Actions Can Be Taken To Favorably Impact Product Productivity?

Favorable impact upon product productivity	Solution Required (service examples)		
Reduce time to peak productivity	Reduce expenditures that are out-of-period with output (i.e. product rental pay-per-period)	Achieve peak output earlier by improving installation and run processes (i.e. on-site consulting)	Reduce net expenditures to acquire product by providing residual value for like-kind product (i.e. trade-in)
Increase peak productivity	Decrease unplanned downtime duration (i.e. provide 24/7 service parts availability)	Increase output capacity by modifying product configuration (i.e. off-site remanufacturing)	Increase output thru operator effectiveness (i.e. simulator training classes)
Sustain peak productivity	Ensure continuity from “Acts of God” (i.e. disaster recovery program)	Guarantee output alignment with input (i.e. pay-per-unit-of-value delivered thru long-term contract)	Assure duration of planned maintenance downtime (i.e. provide like-kind service parts exchange programs)

How Can Net Resource Expenditures Be Impacted?

Net Expenditure Scenario			
Product Management Process/Activity: Maintain Product Configuration/Replace Current Parts With Like-Kind Parts to Prevent Unplanned Product Downtime			
Activity Task Requiring Resource: Plan & Acquire Service Parts			
Resource Required: Advanced Planning & Scheduling (APS) Software			
Resources Expended			
Resource Type		Description of resource	Impact upon expenditures
capital investment	software	invest in license for software	↑
current assets	inventory	reduce turnover as a result of better planning	↓
current expenditures	labor	reduce labor for acquisition and storage	↓
	transport	reduce inbound freight expenses	↓
information		increase data collection for software	↑
Net Impact			↓

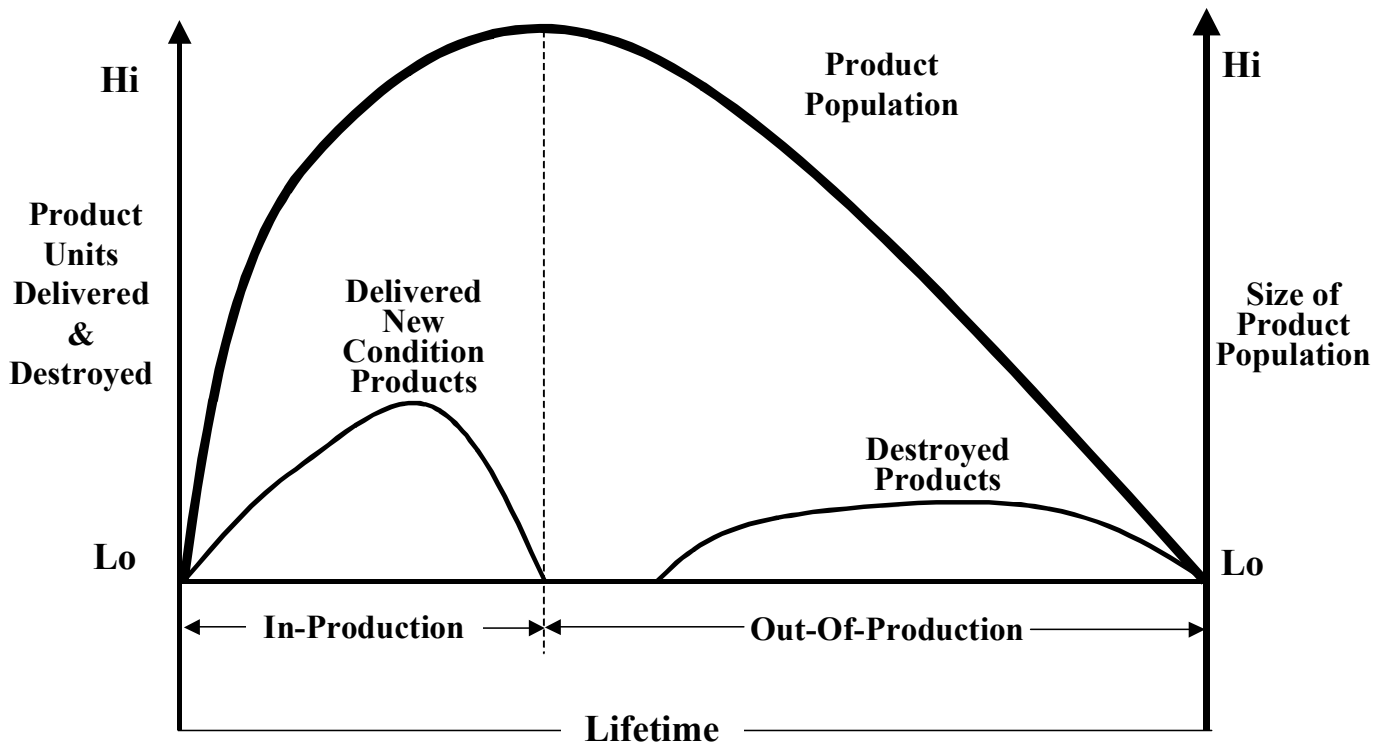
How Do OEMs Measure Financial Performance? Through The Product Lifetime ROI Metric

<p><i>Product Lifetime ROI Metric</i> Returns From Services Crafted By An OEM Over The Lifetime Of A Product</p> <hr/> <p>OEM Design + Manufacturing Investment In Resource Expenditures For All New Product Units Produced</p>	<p>Returns (Revenues x Profit Margin)</p>	<p>Investment In Designing + Manufacturing</p>	<p>OEM Product ROI</p>
	↑↑	↑	↑
	↑	↓	
	↑	↔	
	↔	↓	
	↓	↓↓	

“There are three kinds of expenditures--the costs of capital, the risk premium of economic activity and the capital needs of the future—and they overlap to a considerable extent. But any company should be expected to cover adequately these expenditures. Otherwise it operates at a genuine, certain and provable loss.”

-Peter Drucker

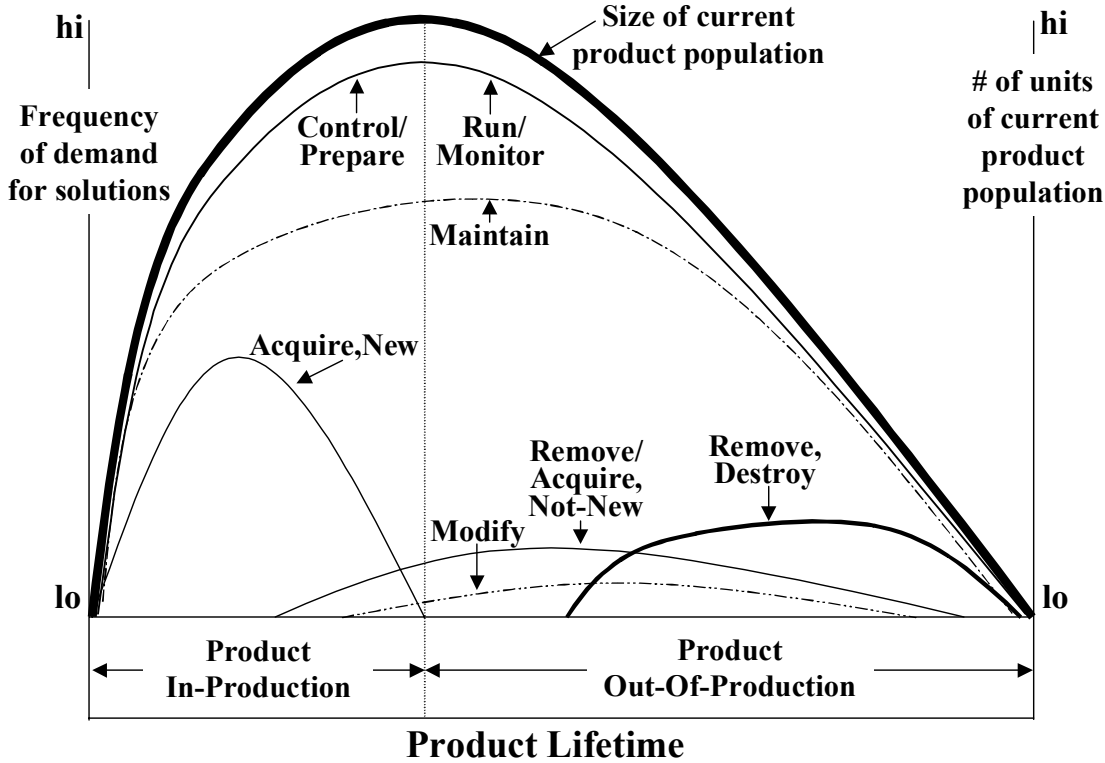
What Is A Product Lifetime?



How Can OEMs Impact The Revenues Of Their Product Lifetime Returns?

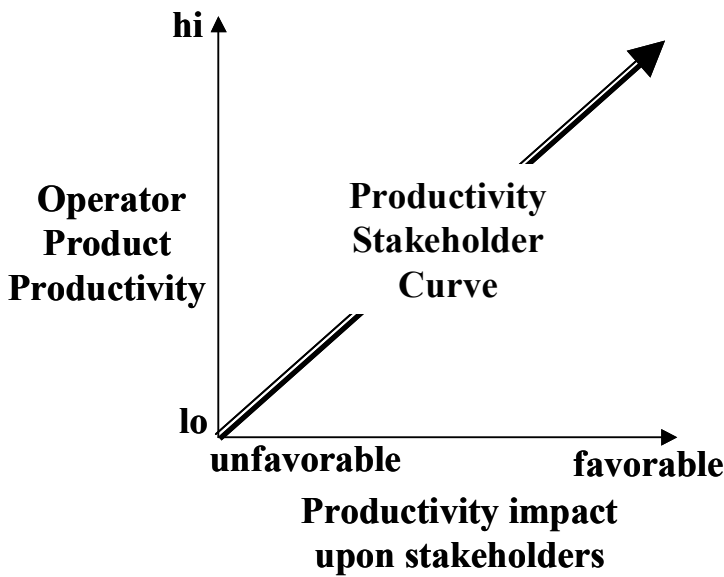
Marketing Strategy Revenue Driver	Revenue Market Size (example)	
	Larger	Smaller
Product Range	All 737 Electronic Platforms	737 GPS Model ABC Hardware Module
Operator Geographical Location	World	US East Coast
Operator Application	All Commercial Passenger, Cargo and Corporate Aircraft	Cargo Aircraft Supporting Auto Industry
Product Lifetime Duration	Modify Product Configuration To Extend Planned Lifetime By 10 Years From Original 15 Years	Do Not Modify Product Configuration To Extend Original Planned Lifetime Of 10 Years
% Of Product Duration Lifetime To Provide Services	Will Supply Services Until Less Than 1% Of Products Manufactured Are Still In Use	Will No Longer Supply Services 3 Years After The Last Product Has Been Manufactured

What Is The Frequency Of Demand For Solutions That Impact Product Lifetime Returns?



The range of services crafted to supply solutions demanded by operators can have a material impact upon not only revenues but contact with operators

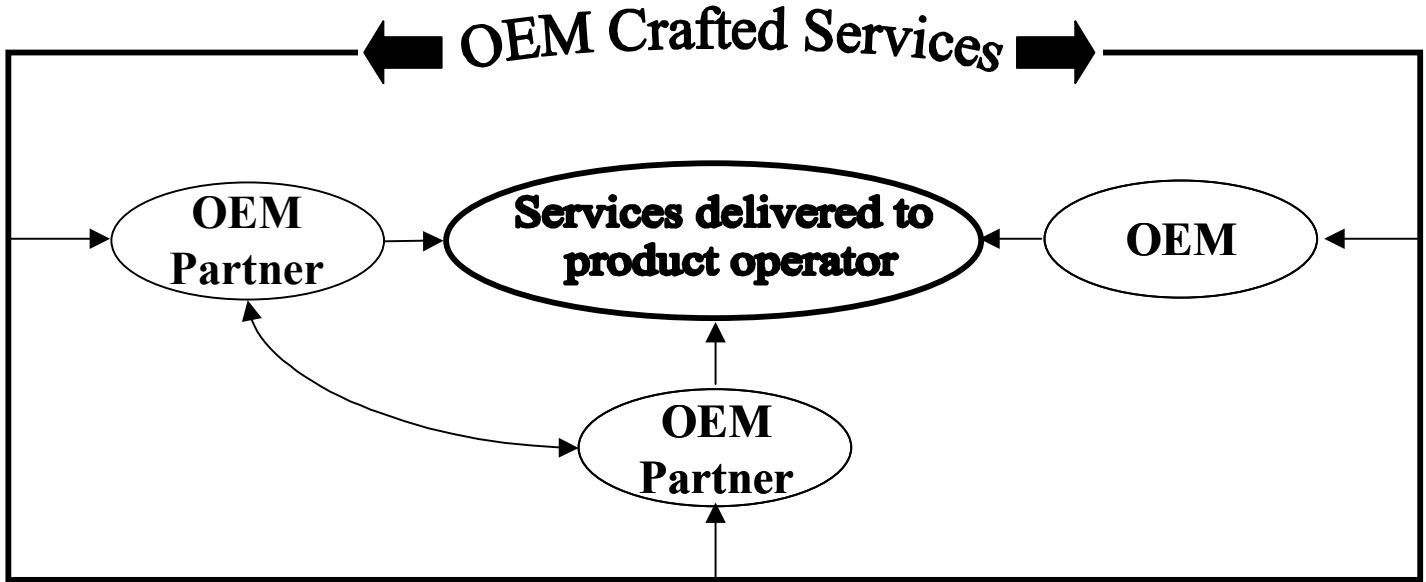
How Can OEMs Impact The Profit Margins Of Their Product Lifetime Returns?



Stakeholders In A Product Operator's Performance	Productivity Impact Upon Stakeholders
Investors In Product Operator Enterprise	Earnings
Product Operator Employees	Wages
OEM as Supplier To Product Operator	Profit Margins
Others	Others

One of the tenets of capitalism is that stakeholders share in the benefits, or the pain, of productivity performance.

How Does An OEM Supply A Service That It Has Crafted?



**The OEM does not have to deliver a service that it has crafted
 .. but it must ensure that it retains the largest share of the profits by working
 closely with its partners and product operators**

Who Are The Enterprises That Supply OEM Crafted Services To Product Operators?

Enterprises Supplied Services To Product Operators	Legacy Solutions Supplied For Managing A Product		
	Acquire, Control, Remove	Prepare, Run, Monitor	Maintain, Modify
OEM direct	✓	✓	✓
<i>OEM partners</i>			
New product distributor	✓		✓
Leasor	✓		✓
Integrator	✓		
OEM subsidiaries	✓	✓	
Maintainer			✓
Trainer		✓	✓
OEM mfg. process supplier		✓	✓
Service parts distributor			✓
Software supplier		✓	✓
Others	✓	✓	✓

What Services Are Supplied To Operators For Managing The Productivity Of A Product?

Service Delivered	Solution Demanded By Operator							
	Acquire	Control	Remove	Prepare	Run	Monitor	Maintain	Modify
Product Sale	✓						✓	
Product like-kind exchange	✓		✓					
Product short-term rental	✓		✓				✓	✓
Product operating lease, long-term	✓		✓				✓	✓
Product multi-operator pooling	✓	✓	✓				✓	✓
Product capital lease	✓							
Product disaster recovery program	✓	✓	✓	✓	✓	✓	✓	✓
Product installation/acceptance				✓				
Product asset tracking software		✓						
Product de-installation			✓					
Product sale/lease-back	✓		✓					
Product buyback/trade-in			✓					
Consumable sale				✓			✓	✓
Technician training				✓	✓	✓	✓	✓
Technical documentation distribution			✓	✓	✓	✓	✓	✓
On-site calibration & testing				✓		✓	✓	✓
Regulatory compliance reporting				✓	✓	✓	✓	✓
Tooling/instrument sale				✓			✓	✓
Operator labor					✓			
Operator scheduling software				✓	✓			
Energy consumption monitoring						✓		
Remote quality of output monitoring						✓		
Hazardous waste disposal			✓		✓		✓	✓
Vendor managed consumables				✓			✓	✓
New service parts sale							✓	✓
Technical consulting			✓	✓	✓	✓	✓	✓
Regulatory requirement change kit sale								✓

What Services Are Supplied To Operators For Managing The Productivity Of A Product?

Service Delivered	Solution Demanded By Operator							
	Acquire	Control	Remove	Prepare	Run	Monitor	Maintain	Modify
Product configuration records mgt.							✓	✓
Maintainer scheduling software							✓	
Life-extension exchange program								✓
Off-site remanufacturing/rebuild/overhaul							✓	✓
On-site maintenance labor							✓	
Reliability records management						✓		
Like-kind component exchange program							✓	✓
Service parts planning software							✓	✓
Remote reliability monitoring						✓		
Pay-per-units-of value delivered							✓	✓
	✓	✓	✓	✓	✓	✓	✓	✓
	✓		✓					
Others	✓	✓	✓	✓	✓	✓	✓	✓

Innovative OEM Product-Services Programs

Description	Program
OEM: Sector	Caterpillar: Construction
Program name: Offering	Cat Rental: Short-term rentals
Who has contact with operator	OEM partners: OEM created new partnership relationship, to differentiate from new product distributors (note that most Cat Rental enterprises are owned by Cat new product distributors)
Operator solution demanded	Acquire/remove product and maintain product configuration
How did solution favorably impact operator productivity	Reduced time to peak performance by reducing capital good investment expenditures and assured the sustainment of peak performance by providing on-site product maintenance or product replacement
Resources supplied	<ul style="list-style-type: none"> Capital investment of new or not-new products capable to deliver units-of-value required by operator (Product delivered is not required to be manufactured by Caterpillar) <ul style="list-style-type: none"> All expenditures for product removal All resources for product configuration maintenance and product configuration modification

Innovative OEM Product-Services Programs

Description	Program
OEM: Sector	Hanover Compressor: OilGas
Program name: Offering	Service Rental Fleet: Buyback and manage former operator's gas extraction compressor. Charge customer on a pay-per-cubic foot of uplifted natural gas basis
Who has contact with operator	OEM
Operator solution demanded	Reacquire, control, prepare, run, monitor, maintain and modify product (complete product management outsourcing)
How did solution favorably impact operator productivity	Increase productivity by extracting residual value thru buyback by OEM and assuring the sustainment of productivity thru guaranteed performance by OEM
Resources supplied	All capital investment, current assets, current expenditures and information

Description	Program
OEM: Sector	Embrex: Healthcare
Program name: Offering	Inovoject: Pay-per-egg inoculated
Who has contact with operator	OEM
Operator solution demanded	Acquire, remove, prepare, maintain and modify
How did solution favorably impact operator productivity	Reduced time to peak productivity, increased peak productivity and assured the sustainment of peak productivity
Resources supplied	Capital investment, current assets for consumables and current expenditures for maintenance

Innovative OEM Product-Services Programs

Description	Program
OEM: Sector	Honeywell Aerospace: Transportation Aerospace
Program name: Offering	MSP: Pay for engine operation on a fixed price per hour of flight (program begun in 1976 for corporate jet market)
Who has contact with operator	OEM authorized repair stations
Operator solution demanded	Maintain and modify engine configuration
How did solution favorably impact operator productivity	Assured sustainment of operator productivity level; guaranteed by OEM. Program also has resulted in higher residual value of engines due to documented maintenance program
Resources supplied	Capital investment (tooling and facilities) Current assets (service parts inventory), current expenditures (labor and consumables) and information

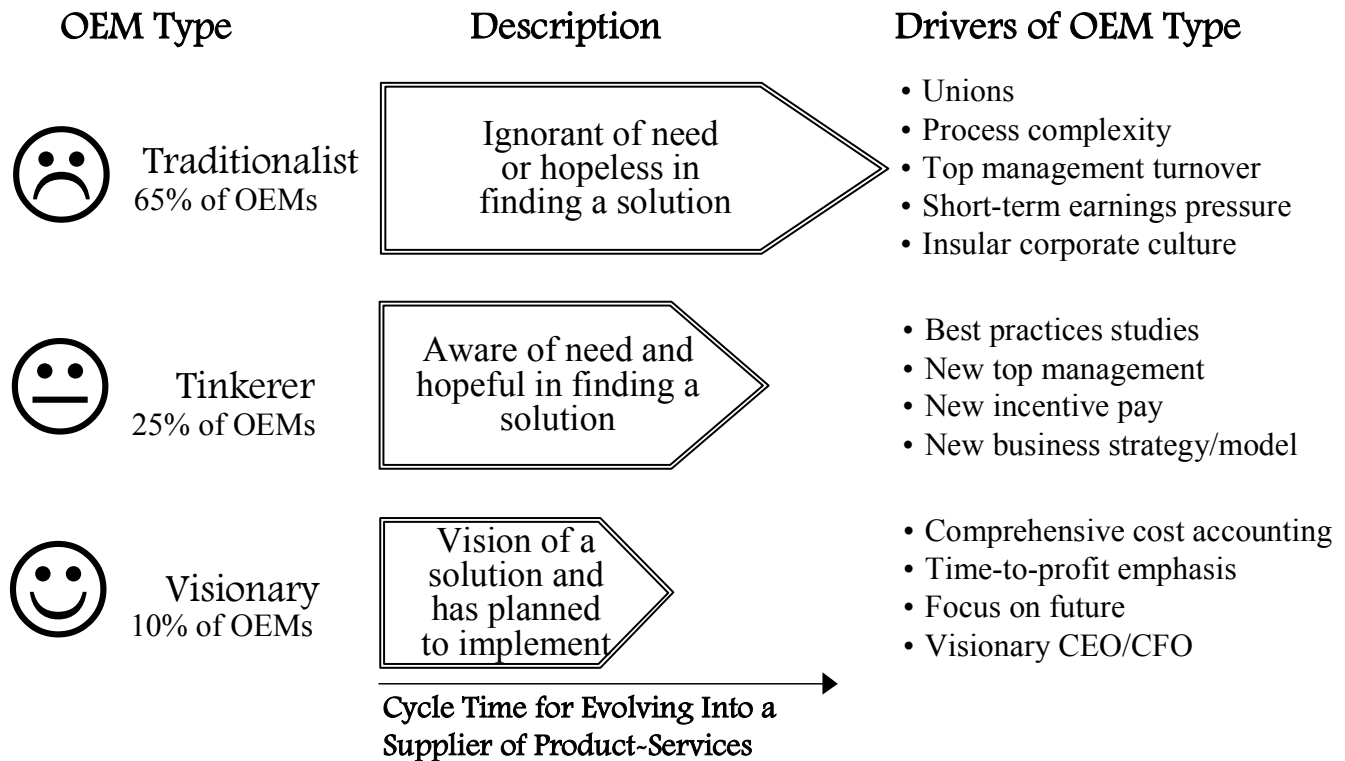
OEMs Have 25 Stakeholders In Their Evolving Into Suppliers Of Product-Services

1. ***OEM executives***; improve financial performance resulting in an increase incentive compensation, such as stock option value
2. ***OEM new product manufacturing suppliers***; higher profit margins and more stable demand throughout product lifetime
3. ***OEM service delivery partners***; closer relationship with OEM, resulting in greater profit opportunities
4. ***Product operators***; lower lifetime expenditures per output unit-of-value
5. ***Financial services***; fees for creation of Special Purpose Entities (SPE), managing captive financial enterprises, issuing asset-backed securities and others
6. ***Enterprise application software providers***; new processes will require new software codification either through modifications to current code or the issue of new modules
7. ***OEM investors***; higher market capitalization due to higher profit margins, faster profit growth and more stable earnings
8. ***Accountants***; more complex balance sheets and income statements will require higher diligence resulting in higher auditing fees

OEMs Have 25 Stakeholders In Their Evolving Into Suppliers Of Product-Services

9. **Lawyers**; more fees due to: more complex contracts between OEM suppliers, channel partners and customers, more legal entities for managing risk (such as LLCs, JVs partnerships), anti-trust due diligence
10. **Management consultants**; new processes will require the re-engineering of the business model, resulting in higher revenue
11. **Educators**; will provide seminars and workshops for stakeholders, resulting in higher revenue
12. **Stock analysts**; changing balance sheet and income statement configuration will require astute financial analysis leading to either higher fees for independent analysts or the attractiveness of recommendations for captive analysts to their brokerage customers
13. **EPA**; will see the benefits of material productivity and its resulting reduction in waste and pollution
14. **Trade groups**; ensures the long-term financial health of their members
15. **Magazines and newspaper press**; driver for “cutting edge” articles
16. **Politicians**; ensures continuity of jobs at OEMs in territories they represent
17. **DOD**; ensures continuity of the capital goods manufacturing industrial base for maintaining future military equipment
18. **Market researchers**; redefinition of the OEM’s market will require studies on market size and share, resulting in fees
19. **Information providers**; accurate information becomes critical in the new OEM business model, such as reliability data, resulting in payments to information gatherers
20. **Product design software providers**; new software will be licensed and maintained for such product design characteristics as design-for-maintainability, design-for-reuse and design-for-disassembly
21. **Professional societies**; create demand for special interest groups that add greater value for members
22. **Logistics services providers**; significantly higher levels of reverse supply chain management will require more transactional activity resulting in more fees
23. **Unions**; will embrace for ensure stable levels of employment by reducing impact of imports
24. **Product operator’s customers**; ensures cutting edge performance from their suppliers
25. **Book publishers**; many opportunities for distributing the Body Of Knowledge (BOK) resulting in additional revenues

Which OEMs Will Successfully Evolve Into Suppliers Of Product-Services?



Final Thought

“In our study of what it takes to turn good companies into great ones, we found that it took on average of four years to crystallize a coherent strategic concept and seven years of intense effort below the radar screen before a company would show a significant and sustained leap to great results. It took Jack Welch over eight years in office before GE’s stock began to significantly and consistently outperform the stock market.”

James Collins, “Good to Great: Why Some Companies Make the Leap...and Others Don’t”