The Servitization of Manufacturing: A Longitudinal Study of Global Trends

Professor Andy Neely
Director, Cambridge Service Alliance
The world of manufacturing is changing…

The shift to service based competitive strategies is not new:


But we may be at a technologically enabled tipping point…

- Servitization/Servicization…
- Product-Service Systems…
- Service Science…
- Remote Product Servicing…
- Intelligent Vehicle Health Management…
Service business model innovation

John Deere iGuide system

Uses GPS technology to automatically shift the steering pattern of the tractor to compensate for implement drift

Customers design and complete market research

Exploiting the internet to enable crowd sourcing
And the opportunities for services continue

Yesterday’s Technology…

Thomas Crapper (1836-1910)
Sanitary Pioneer

Footnote for Sir John Harington who is credited with inventing the first flush toilet in 1596!
Today’s toilet technology

Neorest toilets…
• Lid opens automatically as you walk up…
• The seat’s heated…
• There’s a catalytic air purifier to remove any “unwanted odours”…
• With a manual power override for those particularly unpleasant visits…
• There’s a warm-water massage spray and a hot air dryer…
• The temperature and intensity of both are controlled using a LCD panel…
• Once you’ve finished and left the “sensor zone” the toilet automatically closes the lid and starts a three stage “Cyclone” flush…
• The strength of which depends on how long you’ve been busy on the toilet and previous patterns of usage.
What about tomorrow’s toilet technology?

Put simply…

The servitization of manufacturing = adding services to products…
Why is manufacturing servitizing?

| Economic rationale | 1. Manufacturing firms in developed economies cannot compete on the basis of cost (technological developments are enabling them to add innovative services)…  
2. The installed base argument (e.g. for every new car sold there are already 13 in operation, 15 to 1 for civil aircraft and 22 to 1 for trains)…  
3. Stability of revenues – services vs. products… |
|------------------|-------------------------------------------------------------------------------------------------|
| Strategic rationale | 1. Lock in customers (sell the original equipment at cost, make money on spares & suppliers - razor, printers)…  
2. Lock out competitors…  
3. Increase the level of differentiation (e.g. equipment provider offers to take customer's risk and give predictable maintenance costs)…  
4. Customers demand it (e.g. contracting for capability)… |
| Environmental rationale | 1. Environmental rationale (change notions of ownership and resource use – e.g. Mobility cars)… |
So what can we find out about servitization?

<table>
<thead>
<tr>
<th></th>
<th>2007 dataset</th>
<th>2009 dataset</th>
<th>2011 dataset</th>
</tr>
</thead>
<tbody>
<tr>
<td>Source of data</td>
<td>OSIRIS database</td>
<td>OSIRIS database</td>
<td>OSIRIS database</td>
</tr>
<tr>
<td>Nos. companies</td>
<td>44,000 publicly</td>
<td>55,000 publicly</td>
<td>46,000 publicly</td>
</tr>
<tr>
<td></td>
<td>listed firms</td>
<td>listed firms</td>
<td>listed firms</td>
</tr>
<tr>
<td>Nos. manufacturing firms</td>
<td>22,952 firms</td>
<td>27,670 firms</td>
<td>24,010 firms</td>
</tr>
<tr>
<td>(US SIC codes 10-39)</td>
<td></td>
<td></td>
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<tr>
<td>Nos. manufacturing</td>
<td>12,521 firms</td>
<td>13,259 firms</td>
<td>14,974 firms</td>
</tr>
<tr>
<td>firms with over 100</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>employees</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nos. firms with no</td>
<td>1,478 firms</td>
<td>706 firms</td>
<td>1,077 firms</td>
</tr>
<tr>
<td>business description</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Nos. firms declaring</td>
<td>216 firms</td>
<td>222 firms</td>
<td>122 firms</td>
</tr>
<tr>
<td>bankruptcy</td>
<td></td>
<td></td>
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<tr>
<td>Useable sample</td>
<td>10,827 firms</td>
<td>12,331 firms</td>
<td>13,775 firms</td>
</tr>
</tbody>
</table>
Coding – identifying which firms have servitized

Coding – using business descriptions to identify whether firms classified as manufacturing offer:

- Pure manufacturing, e.g. PetroChina principally engaged in a broad range of petroleum and natural gas-related activities.

- Some combination of manufacturing and service, e.g. Siemens - predominantly electronics and electrical engineering, but provides a wide variety of consulting, maintenance and other services.

- Pure service, e.g. The Brink's Company, conducts business in the security industry. The services offered by the Company include armoured-car transportation, automated teller machine (ATM) servicing, currency and deposit processing, coin sorting and wrapping, and arranging the secure air transportation of valuables.
Despite having manufacturing SIC codes…
In which countries have firms servitized (2007)?

![Graph showing servitization rates in various countries in 2007. The USA has the highest rate, followed by Finland, Singapore, Malaysia, and the Netherlands. The rates decrease as we move down the list to countries like China with the lowest rate.](image-url)
Where has the growth in servitization come from?
Where has the growth in servitization come from?
Has servitization levels declined in some countries?

Changes in levels of servitization from 2007-2011

Germany
USA
Hong Kong
Singapore
Greece
Cayman Islands
Bermuda
Netherlands
Czech Republic
What types of services are offered?
What are the financial consequences of servitization?

SIC 36 = Electronic and other electrical equipment and components is the most common category for servitization.
For SIC 36: What are the financial implications?
For SIC 36: What are the financial implications?
For SIC 36: Do servitized firms deliver higher profits?

<table>
<thead>
<tr>
<th>Source</th>
<th>SS</th>
<th>df</th>
<th>MS</th>
<th>Number of observations</th>
<th>1623</th>
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</thead>
<tbody>
<tr>
<td>Model</td>
<td>1.31E+14</td>
<td>3.00E+00</td>
<td>4.38E+13</td>
<td>F(3, 1619)</td>
<td>531.83</td>
</tr>
<tr>
<td>Residual</td>
<td>1.33E+14</td>
<td>1.62E+03</td>
<td>8.24E+10</td>
<td>Prob &gt; F</td>
<td>0</td>
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<tr>
<td>Total</td>
<td>2.65E+14</td>
<td>1.62E+03</td>
<td>1.63E+11</td>
<td>R-squared</td>
<td>0.4963</td>
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<tr>
<td></td>
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<td></td>
<td></td>
<td>Adjusted R-squared</td>
<td>0.4954</td>
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<tr>
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<td></td>
<td>Root MSE</td>
<td>2.90E+05</td>
</tr>
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</table>

| plbefor~2009   | Coef.         | Std. Err. | t      | P>|t| | [95% Conf. Interval] |
|----------------|---------------|-----------|--------|------|---------------------|
| noofemploy~r   | 5.16867       | 0.3744969 | 13.8   | 0    | 4.43412             | 5.903219 |
| servitized     | -2088.722     | 14696.17  | -0.14  | 0.887 | -30914.23           | 26736.78 |
| plbefor~2008   | 0.5469217     | 0.0146042 | 37.45  | 0    | 0.5182766           | 0.5755667 |
| constant       | -8734.56      | 9208.648  | -0.95  | 0.343 | -26796.68           | 9327.562 |
For SIC 36: Does the Market Value Servitization?
For SIC 36: Does the Market Value Servitization?
For SIC 36: Does the market value servitization?

<table>
<thead>
<tr>
<th>Source</th>
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<th>MS</th>
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<tbody>
<tr>
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<td>$3.00E+00$</td>
<td>$1.53E+16$</td>
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<tr>
<td>Residual</td>
<td>$2.65E+15$</td>
<td>$1.16E+03$</td>
<td>$2.28E+12$</td>
<td>Prob &gt; F</td>
<td>0</td>
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<tr>
<td>Total</td>
<td>$4.86E+16$</td>
<td>$1.17E+03$</td>
<td>$4.16E+13$</td>
<td>R-squared</td>
<td>0.9454</td>
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<td>Adjusted R-squared</td>
<td>0.9452</td>
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<td></td>
<td></td>
<td>Root MSE</td>
<td>$1.50E+06$</td>
</tr>
</tbody>
</table>

| entvalu~2009    | Coef.  | Std. Err. | t     | P>|t|  | [95% Conf. Interval] |
|-----------------|--------|-----------|-------|------|---------------------|
| noofemploy~r    | 35.04325 | 2.247654 | 15.59 | 0    | 30.63334 39.45316   |
| servitized      | 26786.3 | 89960.41 | 0.3   | 0.766 | -149716.6 203289.2  |
| entvalu~2008    | 1.031865 | 0.0088113 | 117.11 | 0    | 1.014577 1.049153   |
| constant        | 106201.6 | 59018.21 | 1.8   | 0.072 | -9592.478 221995.7  |
The story so far… a servitization paradox

1. Widespread efforts to servitize…
   55% of US firms with manufacturing SIC codes offer services.

2. Although the extent of servitization differs markedly by country…
   Less than 2% of Chinese manufacturing firms had servitized by 2007 (Neely, 2009).

3. The gap is closing fast…
   By 2011 18% of Chinese manufacturing firms had servitized and we also see rapid growth in France, Japan, Norway, China, Sweden and the UK (Neely, 2011).

4. But while services are thought to deliver higher margins, there is mixed evidence on the financial consequences of servitization… Some firms achieve good profits and valuations, but an equal number some fail to!
   (Gebauer et al, 2005; Neely, 2009; Visnjic and Van Looy, 2009).

5. It seems the transition journey – the shift to services – needs to be better understood…
The challenges of servitizing…

**Shifting mindsets**
- Of marketing – from transactional to relational
- Of sales – from selling multi-million dollar products to selling service contracts and capability
- Of customers – from wanting to own the product to being happy with the service

**Timescale**
- Managing and delivering multi-year partnerships
- Managing and controlling long term risk and exposure
- Modelling and understanding the cost and profitability implication of long-term partnerships

**Business model and customer offer**
- Understanding what value means to customers and consumers (not producers and suppliers)
- Developing the capability to design and deliver services rather than products
- Developing a service culture
- Embedding all of the above into a service organisation
For further details

Professor Andy Neely
Director, Cambridge Service Alliance
University of Cambridge
Institute for Manufacturing
17 Charles Babbage Road
Cambridge, CB3 0FS

Mobile   +44 (0)7711 140198
E-mail    andy.neely@eng.cam.ac.uk
www.ifm.eng.cam.ac.uk/people/adn1000/