Competing on the Market Life Cycle

Disruptive Technology

New Technology
A Compelling Application
Complementary Innovators
Channels

Product Line Development and Market Expansion

Good, Better, Best
Next Generation R&D
Full Market Development

Enterprise Growth
Leveraging Technology
New Market Applications,
New Business Models

Stagnation & Decline

Abernathy
Utterback
Christensen

Time

Cumulative Sales

Von Hippel
Friar

Moore

Meyer & Lehnard
Wheelwright & Clark

Levitt, Abell
Leonard & Rayport

Niche Players

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  - A Compelling Application
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- Enterprise Growth
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  - Christensen

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Time

Cumulative Sales

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Digital Photography
20 Years After Initial Development

InfoTrends Research Group:

• 20% of U.S. households now own a digital camera.
• 30% by the end of 2003.
• 45% of respondents own a digital camera
• 24% of Internet-connected households plan first purchase this year.

Latent need:

• 78% of digital camera users are not proactively taking steps to manage and archive their digital photos for the long term.

• Consumers are not concerned about archiving because most are not aware of how easily they could lose their digital photos to viruses, obsolete storage media, or hard drive crashes.
And if it actually sticks ...

Once you figure out which segment is going to take off – you will have to scale the business rapidly, because the “big boys” will try to storm in.

- Channels of distribution

- Production to lower costs to reach more users.

- Services to help people who are not lead users figure out the product/system.
The Knickerbocker Company was instrumental in developing elevators for moving ice such as the one illustrated. Here the endless-chain elevator carries ice unloosed from the ship to waiting wagons for immediate delivery or to the ice house for storage.
Tudor Ice Company Shipments

The Experience Curve
Cost of Ice in Constant $/Ton

<table>
<thead>
<tr>
<th>Year</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>1790</td>
<td>$100</td>
</tr>
<tr>
<td>1800</td>
<td>$10</td>
</tr>
<tr>
<td>1830</td>
<td>$1</td>
</tr>
<tr>
<td>1885</td>
<td>$.12</td>
</tr>
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</table>
Ice Making Plants in the U.S.
U. S. Ice Exports

Exports (ton)

- Exports (ton)
Stagnation and Decline
Core Product Technologies Become Core Rigidities
Stagnation and Decline

Manufacturing Assets Become Rigidities
<table>
<thead>
<tr>
<th>Year</th>
<th>Motor vehicles sales (in thousands of units)</th>
<th>% of market share</th>
<th>% of employees salaried</th>
<th>Labor rate (in $ per hour)</th>
<th>Manufacturing cost as % of list price*</th>
<th>Direct labor hours per vehicle†</th>
<th>Fixed assets per $ sales</th>
<th>Labor hours per vehicle</th>
<th>Profit (loss) (in millions of dollars)†</th>
</tr>
</thead>
<tbody>
<tr>
<td>1910</td>
<td>32</td>
<td>10.7%</td>
<td>6.9%</td>
<td>$0.25</td>
<td></td>
<td>232</td>
<td>232</td>
<td>232</td>
<td>$15</td>
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<tr>
<td>1911</td>
<td>70</td>
<td>20.3%</td>
<td>3.5%</td>
<td>0.23</td>
<td></td>
<td>265</td>
<td>265</td>
<td>265</td>
<td>21</td>
</tr>
<tr>
<td>1912</td>
<td>170</td>
<td>22.1%</td>
<td>5.5%</td>
<td>0.23</td>
<td></td>
<td>$0.10</td>
<td>95</td>
<td>95</td>
<td>40</td>
</tr>
<tr>
<td>1913</td>
<td>203</td>
<td>39.6%</td>
<td>4.9%</td>
<td>0.27</td>
<td>41%</td>
<td>65</td>
<td>0.11</td>
<td>152</td>
<td>75</td>
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<tr>
<td>1914</td>
<td>308</td>
<td>48.0%</td>
<td>5.7%</td>
<td>0.55</td>
<td>40%</td>
<td>42</td>
<td>0.15</td>
<td>79</td>
<td>90</td>
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<tr>
<td>1915</td>
<td>501</td>
<td>43.4%</td>
<td>4.5%</td>
<td>0.55</td>
<td></td>
<td>47</td>
<td>0.19</td>
<td>72</td>
<td>74</td>
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<tr>
<td>1916</td>
<td>735</td>
<td>38.6%</td>
<td>4.4%</td>
<td>0.55</td>
<td></td>
<td>178</td>
<td>0.15</td>
<td>84</td>
<td>178</td>
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<tr>
<td>1917</td>
<td>664</td>
<td>46.1%</td>
<td>3.2%</td>
<td>0.61</td>
<td>79%</td>
<td>47</td>
<td>0.16</td>
<td>106</td>
<td>51</td>
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<tr>
<td>1918</td>
<td>498</td>
<td>43.5%</td>
<td>3.5%</td>
<td>0.66</td>
<td></td>
<td>133</td>
<td>0.22</td>
<td>133</td>
<td>95</td>
</tr>
<tr>
<td>1919</td>
<td>941</td>
<td>46.9%</td>
<td>3.0%</td>
<td>0.76</td>
<td></td>
<td>100</td>
<td>0.26</td>
<td>100</td>
<td>140</td>
</tr>
<tr>
<td>1920</td>
<td>463</td>
<td>2.9%</td>
<td>2.9%</td>
<td>0.84</td>
<td>70%</td>
<td>49</td>
<td>0.27</td>
<td>267</td>
<td>64</td>
</tr>
<tr>
<td>1921</td>
<td>971</td>
<td>55.4%</td>
<td>1.9%</td>
<td>0.87</td>
<td></td>
<td>102</td>
<td>0.22</td>
<td>102</td>
<td>125</td>
</tr>
<tr>
<td>1922</td>
<td>1,307</td>
<td>1.4%</td>
<td>2.6%</td>
<td>0.82</td>
<td>60%</td>
<td>31</td>
<td>0.20</td>
<td>125</td>
<td>237</td>
</tr>
<tr>
<td>1923</td>
<td>2,019</td>
<td>47.5%</td>
<td>1.1%</td>
<td>0.85</td>
<td></td>
<td>125</td>
<td>0.19</td>
<td>125</td>
<td>193</td>
</tr>
<tr>
<td>1924</td>
<td>1,929</td>
<td>1.2%</td>
<td>2.8%</td>
<td>0.83</td>
<td>62%</td>
<td>35</td>
<td>0.25</td>
<td>140</td>
<td>214</td>
</tr>
<tr>
<td>1925</td>
<td>1,920</td>
<td>41.5%</td>
<td>1.2%</td>
<td>0.83</td>
<td></td>
<td>160</td>
<td>0.27</td>
<td>160</td>
<td>219</td>
</tr>
<tr>
<td>1926</td>
<td>1,563</td>
<td>1.4%</td>
<td>2.6%</td>
<td>0.87</td>
<td>93%</td>
<td>69</td>
<td>0.33</td>
<td>178</td>
<td>132</td>
</tr>
<tr>
<td>1927</td>
<td>424</td>
<td>10.6%</td>
<td>1.5%</td>
<td>0.87</td>
<td></td>
<td>475</td>
<td>0.81</td>
<td>475</td>
<td>(65)</td>
</tr>
<tr>
<td>1928</td>
<td>750</td>
<td>2.0%</td>
<td>2.0%</td>
<td>0.84</td>
<td>375%</td>
<td>143</td>
<td>0.84</td>
<td>375</td>
<td>(143)</td>
</tr>
<tr>
<td>1929</td>
<td>1,870</td>
<td>32.0%</td>
<td>2.1%</td>
<td>0.92</td>
<td>86%</td>
<td>80</td>
<td>0.40</td>
<td>182</td>
<td>175</td>
</tr>
<tr>
<td>1930</td>
<td>1,432</td>
<td>2.8%</td>
<td>2.8%</td>
<td>0.54</td>
<td>210%</td>
<td>113</td>
<td>0.54</td>
<td>210</td>
<td>113</td>
</tr>
<tr>
<td>1931</td>
<td>731</td>
<td>26.2%</td>
<td>4.0%</td>
<td>69%</td>
<td></td>
<td>40</td>
<td>1.06</td>
<td>290</td>
<td>(97)</td>
</tr>
</tbody>
</table>

†Computed from direct labor cost for models specified above and from Ford labor rates.

By the mid-1920’s, users preferred a heavier, closed-bodied car. GM responded much faster, while Ford was bound by its current processes.

Alfred Sloan wrote:

“Mr. Ford had frozen his policy on the Model T … an open-car design. It was unsuited to the heavier closed body … in less than two years (by 1923) the closed body made the already obsolescing design of the Model T noncompetitive as an engineering design.

The old master had failed to master change … his precious volume, the foundation of his position, was fast disappearing. He could not continue losing sales and maintain his profits.

He shut down his great River Rouge plant completely … leaving the field unopposed and opening it to Mr. Chrysler’s Plymouth.”
Stagnation and Decline

Financial Measures for Mature Business Applied Blindly to New Ones
Risk Management on Innovation

Example

Executive huddles to micromanage work

Gate 1

Gate N

Business plans prototypes

Product/process development

Process Ramp

Initial Launch

Expansion

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Stagnation and Decline
CEOs Detached from R&D
Morale suffers when business groups don’t systematically use internal innovations.

"Don’t have time for anything new. I’ve got a battle to fight!"
Circles of NonCollaboration
Enterprise Growth
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Stagnation & Decline

Cumulative Sales

Time
Can You Work in All Three Phases?
Different Approaches, Different Expectations

Cumulative Sales

Time

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What’s New .. Just about everything!

Organic renewal means that upon occasion, it’s okay to break the rules.

• New target user

• New target channel

• New pricing

• Different branding

• As well as new capital equipment, and bodies to bring product to plant

• Real-time, multifunctional team control

(Many of these decisions cannot be done with classic empirical, like-product volumetric tests!)