This document contains sample solutions to the Intel problems on HW # 2 (Problem 2) and HW # 3 (Problem 1).

Please note that these solutions represent only one of several possible excellent solutions to each open-ended problem.
HW#2, PROBLEM#2: Intel
2. Intel Case Study

Define Problem:
- Collect data from the Intel case study
- Use this data to complete these tasks:
  - Use Porters five (six) forces model to map the industry landscape, analysing the key relationships between the players in the landscape
  - Assess Intel’s technology strategy from 1968 to 1997
  - Track changes from 1968 to 1997 in
    - Technology strategy
    - Product/market strategy
    - Developmental goals
  - Relate these changes to key driving forces (determined by the creation of functional maps)

Plan:
1. Data Assembly – assemble notes in the following categories (present each in a TABLE)
   - **Company Analysis**: Description and changes in strategy (including reasons where stated):
     - Technology
     - Product/Market
     - Goals
   - **Industry Analysis**: (including relationships)
     - Suppliers
     - Competitors
     - Buyers
     - Substitutes
     - New Entrants
     - Complementers
   - **Functional Map**:
     - Note significant changes in revenue, technology, etc
     - This data can come from company and industry analysis

2. Data Presentation
   - Assemble complete functional map
   - Draw up porter model, and include notes on relationship between players
     - Draw industry map
     - Perform forces analysis
     - Determine relationship between players
     - Determine attractiveness of industry
     - Determine companies position

3. Data Analysis
   - Link the changes in technology and product/market strategy and developmental goals to events on the functional map
   - Compose assessment of technology strategy

Execution:

Data Assembly
Company Analysis:
<table>
<thead>
<tr>
<th>Year</th>
<th>Products</th>
<th>Marketing Strategies</th>
</tr>
</thead>
<tbody>
<tr>
<td>1969</td>
<td>SRAM 3101 &amp; 1101</td>
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<tr>
<td>1970</td>
<td></td>
<td>Ted Hoff designed 4004 CPU</td>
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<tr>
<td></td>
<td></td>
<td>Contracted with Busicom to create chips for electronic calculator</td>
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<tr>
<td>1971</td>
<td>DRAM 1103</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>DRAM 1103 accounted for 90% of revenues</td>
</tr>
<tr>
<td>1973</td>
<td>8080</td>
<td></td>
</tr>
<tr>
<td>1979</td>
<td>Had 1Kbit, 2Kbit, 4Kbit, 16Kbit DRAM</td>
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<td></td>
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<tr>
<td>1980</td>
<td></td>
<td>Project Crush to get 2000 design wins (got 2500 design wins), especially from IBM</td>
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<tr>
<td></td>
<td></td>
<td>Began supplying IBM with 8088 chip</td>
</tr>
<tr>
<td></td>
<td>70%-80% Production Yields for Japanese Firms in Semiconductors in early 1980s</td>
<td></td>
</tr>
<tr>
<td></td>
<td>50%-60% Production Yields for US Firms in Semiconductors in early 1980s</td>
<td></td>
</tr>
<tr>
<td></td>
<td>8088</td>
<td></td>
</tr>
<tr>
<td>1981</td>
<td></td>
<td>Cumulative total of 50 000 8086s shipped</td>
</tr>
<tr>
<td>1982</td>
<td>64Kbit DRAM</td>
<td></td>
</tr>
<tr>
<td>1983</td>
<td>80286</td>
<td>Project ‘CHECKMATE’ to win contracts for 80286, won with IBM</td>
</tr>
<tr>
<td>1984</td>
<td>1Mbit DRAM (decided not to pursue based on Japanese manufacturer’s lead in process technology)</td>
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<tr>
<td>1985</td>
<td>Accounted for 1/3 R&amp;D</td>
<td></td>
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<tr>
<td></td>
<td>80386 (32 bit)</td>
<td>DRAM accounted for 5% of revenues</td>
</tr>
<tr>
<td>1986</td>
<td></td>
<td>Sold 802386s to Compaq for Deskpro 386</td>
</tr>
<tr>
<td>1987</td>
<td></td>
<td>Cumulative total of 800 000 80386s shipped</td>
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<tr>
<td>1989</td>
<td>80486, i860 (not compatible with X86 software line, but released anyway under management’s nose)</td>
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<tr>
<td></td>
<td></td>
<td>Marketed both CISC 80486 and RISC i860 simultaneously</td>
</tr>
<tr>
<td>1990</td>
<td>Began manufacturing motherboards (system business accounted for 25%-30% of company total revenue)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Intel Inside</td>
</tr>
<tr>
<td>1993</td>
<td></td>
<td>$500 million spend on Intel Inside so far</td>
</tr>
</tbody>
</table>
1997

- $750 million spent this year on marketing
- Intel has 90% share of the microprocessor market

- Technology Notes
  - Design focus, not manufacturing focus
  - Found new product introductions were delayed by 2 years because of manufacturing problems – mid 1980s
  - Technology decisions steered product/market decisions (reduction of production of memory in favour of logic)

- Product/Market Notes
  - First to market with newest devices
  - IBM’s redefinition of standards and attempt to corner the market led to a “horizontal” alignment for the industry, with open standards and specialisation

- Developmental Goals Notes
  - Movement from memory to logic

Industry Analysis:

- Suppliers
  - Capital investments of $4.5 billion in 1997
  - In 1985, sole sourcing strategy
  - In 1990, dual source strategy to improve technical support and product improvement

- Competitors
  - Motorola 68000 dominated the workstation market until late 1980s
  - “CHECKMATE” and “CRUSH” targeted Motorola
  - Strategy for fifth (Pentium) and sixth (Pentium Pro) was to achieve overwhelming advantage in performance over competitive offerings
  - Licensed IBM to produce 80386, it was the sole licensee, and could only sell them in their own PCs (positioned Intel as leading player)

- Buyers
  - Apple Chose Motorola 68000 as its standard
  - IBM chose to purchase many components from outside vendors
  - Began selling to Compaq in 1986
  - Microprocessor accounts for 20%-40% of total manufacturing cost of a PC
  - Intel Inside
    - Created brand recognition
    - Designed to complement OEM (original equipment manufacturer)marketing
    - Buyers felt the campaign undercut their brands, rather than being complementary
    - Combines brand power
    - Computer buyers preferring Intel rose from 60% in 1992 to 90% in 1993
    - Compaq in 1996 agreed to rejoin Intel Inside, as well as agreeing to share technology
    - IBM in 1997 rejoined the campaign
  - Electronic subsystems
    - Began manufacturing and selling motherboards and complete PCs to companies like AT&T, Unisys, Dell, Hewlett Packard
  - New product introductions
- As product life cycles shrunk, new microprocessors were required more often
- As production ramp up took a while, Intel added a premium to reduce demand
- Intel “rationed” chips to OEMs

- Substitutes
  - Threat from RISC in 1989, predicted to take 40% of market by 1994 (Motorola 88000, 13 full page ads in Wall Street journal)
  - RISC not considered a threat to Intel’s desktop market at this time
  - RISC threat lead to stepping up of Intel’s R&D for new generations of the X86

- New Entrants
  - Licensed 12 other companies to produce the 8086, retaining 30% of revenues and profits
  - Licensed 4 other companies to produce the 80286, retaining 75% of revenues and profits
  - AMD acquired NextGen in 1995, that allowed it to compete with Intel designs with the Nx686
  - Approached manufacturers of microprocessors with litigation, from 1987 to 1995 litigated against AMD Athlon for uses of microprocessor code
  - NexGen started up (by Compaq with 10%) to design Intel X86 substitute microprocessors

- Complementers
  - Microsoft OS technology was lagging behind chip technology in 1989

**Functional Map:**

<table>
<thead>
<tr>
<th>Year</th>
<th>Desktop Computing</th>
<th>Software</th>
</tr>
</thead>
</table>
| 1977 | • Apple, Radio Shack, and Commodore enter Desktop Market  
  • These three companies control 2/3 of the market, with Apple controlling 27% | |
| 1980 | IBM enters Desktop Market | |
| 1981 | IBM generates $500 million in revenue | |
| 1983 | Compaq formed to market portable PCs | |
| 1985 | IBM generates $5.5 billion in revenue | |
| 1989 | | 32 bit software market developed significantly only after introduction of 80486 |

- Market Share in DRAM
  - Exhibit 1.5 (overlay 1.4 on top for 1984)
- Effect of 836 on PC manufacturers
  - Exhibit 1.6
- RISC emergence
  - Exhibit 1.9
- Price and Characteristics of Intel Processors
  - Exhibit 1.11
- Intel’s Financial Results
  - Exhibit 1.12
Data Presentation: Functional Map

Various Dimensions Over Time

- IBM Revenue ($billions)
- Compaq Revenue ($billions)
- Apple Revenue ($billions)
- 80286 Processor Price ($hundreds)
- 80386 Processor Price ($hundreds)
- 80486 Processor Price ($hundreds)
- Transistor Count (millions)
- CISC Equipped PCs Shipped (millions)
- RISCs Shipped (millions)
- Intel Revenue ($billions)
- Intel DRAM Market Share (10%)

Key Events:
- 1980 – IBM Enters PC Market
- 1983 – Compaq Enters PC Market
- 1989 – 32 Bit Software Market Becomes Significant
Porter Analysis

Industry Map

Microprocessor Industry in the 1990s

New Entrants
AMD, NexGen

Force 2:
threat of
new entrants

Suppliers
Capital
Equipment
Manufacturers

Force 5:
supplier
power

Competitors
Force 1: Rivalry between
competitors
Intel, Motorola, IBM

Buyers
(segment)
IBM, Compaq,
AT&T, Unisys,
Dell, Hewlett
Packard

Force 4:
buyer
power

Complementers
Microsoft (DOS,
Windows OS), 3rd Party
Software Companies

Force 6:
power to
influence

Substitutes
Motorola (RISC)

Force 3:
threat of
substitutes
<table>
<thead>
<tr>
<th>Force</th>
<th>Relationship</th>
<th>Strength</th>
</tr>
</thead>
</table>
| 1     | • Intel competes intensively with Motorola, conducted specific competitive strategies “CRUSH” and “CHECKMATE” against Motorola  
• In later years, competitive strategy was based around overwhelming performance/cost ratio                                                                                   | MEDIUM     |
| 2     | • New entrants find it hard to combine good economies of scale with good performance and design  
• Intel deals aggressively with new entrants it perceives to be using its intellectual property (litigation against AMD 1987-1995)                                                        | MEDIUM     |
| 3     | • Threat of RISC systems was overestimated, they were estimated to take 40% of the market by 1994, which did not happen  
• Commitment to the X86 CISC 80486 was made in 1989                                                                                                       | LOW        |
| 4     | • Microprocessor manufacturers have significant power over PC manufacturers, as the microprocessor accounts for 20%-40% of the cost of the PC  
• Intel has consistently played its buyers against each other, selling to Compaq when IBM would not commit to the 80386 in 1986  
• Aggressive ‘Intel Inside’ branding strategy attempted to make buyers complementers  
• Due to shortening product cycles and large ramp up production costs, Intel increases premiums to newer chips, to “ration” quantity sold to buyers | MEDIUM     |
| 5     | • Capital intensive industry, Intel had $4.5 billion of capital investments in 1997  
• Under single supplier model (for standardisation and efficiency for intel) supplier of capital equipment had a lot of power, and technical support and improvement lagged behind what Intel expected  
• This led Intel to adopt a dual-sourcing strategy in 1990                                                                                                       | MEDIUM     |
| 6     | • Software and OS development often follows hardware advances, introduces lag to hardware takeup (e.g. 32 bit OSs were not ready for launch of 32 bit microprocessors)                                              | LOW (SUPPORTIVE FORCE) |

In the microprocessor industry, Intel has adopted a differentiated strategy, producing high quality products for the whole market.

The barrier to entry of the microprocessor industry is MEDIUM. Assuming a player can quickly find economies of scale and has a good design team, they can become quickly established.
Data Analysis

- **Technology Strategy**
  - Intel began in memory production and development
  - Competition with Japanese firms with larger economies of scale reduced Intel’s market share (see functional map of Intel’s DRAM market share)
  - Intel’s development of the microprocessor (first designed in 1970) led to more and more R&D being assigned to this branch of the company
  - Technology strategy change came from the middle of the company, DRAM was still pursued from senior managements perspective until 1986
  - Microprocessor development allowed Intel to sustain its revenue increases
  - Intel stuck with CISC architecture when threatened with RISC, this decision was supported by the fact RISC was not being picked up by PC manufacturers (see functional map – CISC and RISC shipped)

- **Technology Strategy Assessment**
  - Intel eventually correctly repositioned itself by getting out of DRAM, but there was insufficient leadership to officially move away from DRAM at the ‘correct’ time
  - R&D money was still going into DRAM until 1986 (still accounted for 1/3 of R&D in 1985), when it was becoming clear that microprocessors were the way to go
  - Despite this lack of nimbleness from the higher levels of the company, the move of the line managers towards the microprocessor allowed Intel to lead design and economies of scale in the microprocessor market, leading to their eventual dominance (90% of the microprocessor market)
  - Thus, Intel’s technology strategy is sound, but it could have been more effectively implemented

- **Market Strategy**
  - Aggressive marketing strategy in 1980 (Project “CRUSH”) coincides with IBM’s entry into the PC market, this repeats with Project “CHECKMATE” to secure more IBM contracts
  - Intels primary buyer shifts to Compaq in 1986 because IBM would not commit to 80386, Intel can effectively play the big buyers (see functional map of buyers revenue) against each other, Intel’s higher revenue (see functional map) suggests more power lies with Intel
  - “Intel Inside” marketing strategy to engage with the end user in 1990 lead to big gains in revenue 1990-1995 (see functional map of Intel revenue)
  - Developed pricing strategy to increase premium on new chip designs to reduce demand when production was being ramped up, this extra profit also helped to cover start-up costs (see functional map, price of different processors)

- **Development Goals**
  - Development goals have remained constant, be the first to market with the best product
  - This goal was not achievable in DRAM, but was achievable in microprocessors
  - Intel did not officially realise this fact until 1986, when its share of the DRAM was insignificant
  - Practically, the development of the company had shifted towards the ‘logic’ side of the business before the official stance changed, so Intel was well positioned to take advantage of conditions within the industry (using clever marketing and buyer manipulation) to emerge as the star player
HW#3, PROBLEM#1: INTEL 2004

1. Intel 2004
Define:
- Read “Intel 2004” article
- Answer the following questions:
  o How have Intel’s Technology Strategy, Product/Market Strategy, and developmental goals changed from its inception (1968) to 2004?
  o When describing these changes, indicate the key driving forces.
  o What do you think are the three key technology/product initiatives that the CEO Craig Barrett should pursue during the next year (2005)?

Plan:
1. Data Assembly – read the “Intel 2004” article and write notes in the following areas (using TABLES):
   a. Company Analysis
      i. Product/Market Strategy
      ii. Technology Strategy
      iii. Developmental Goals
   b. Industry Analysis
      i. Suppliers
      ii. Competitors
      iii. Buyers
      iv. Substitutes
      v. New Entrants
      vi. Complementers
   c. Data for FUNCTIONAL MAPS
      i. Note significant changes in revenue, market share, etc
2. Data Processing
   a. Assemble FUNCTIONAL MAPS
   b. Combine data with that obtained from Homework #2, Problem 2
3. Data Analysis (CONCLUSION)
   a. Copy analysis of Technology Strategy, Product/Market Strategy, and developmental
goals to 1997 from Homework #2, Problem 2.
   b. Append analysis up to 2004, referencing appropriate data.
   c. Indicate the three key technology/product initiatives that should be pursued.

**Execution:**

*Data Assembly*

**Company Analysis**

<table>
<thead>
<tr>
<th>Year</th>
<th>Technology</th>
<th>Product/Marketing</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000</td>
<td></td>
<td>• Intel Capital pumped $150 million into companies in Wi-Fi space (hotspots, etc) who would buy Intel chipsets&lt;br&gt;• Followed up with $300 Million marketing campaign</td>
</tr>
<tr>
<td>2002</td>
<td>• Kept investing in plants&lt;br&gt;• Releasing Itanium 2</td>
<td>Lost $100 Million after shutting down web hosting</td>
</tr>
<tr>
<td>2004</td>
<td>• $28 billion invested into new plants and technologies&lt;br&gt;• Will unveil chip based on Wimax Technology for high speed wireless internet (costs $100,000 to provide access to a metropolis)&lt;br&gt;• Committing $500 million to LCOS&lt;br&gt;• Added 64 bit capabilities to Xeon processors</td>
<td>• Targeting 10 new product areas (consumer electronics [worth $100 billion], communications)&lt;br&gt;• Investing $2 billion to get into new markets&lt;br&gt;• Intel Capital created $200 million fund to support companies involved in the “digital home”</td>
</tr>
<tr>
<td>2005</td>
<td>• New plants will produce 2.5 as much product&lt;br&gt;• Will be able to produce 375 million processors a year, compared to TI, with a maximum of 75 million chips a year&lt;br&gt;• Shutting down older plants will cost no more than $5 million per plant</td>
<td></td>
</tr>
</tbody>
</table>

**Product/Marketing Notes:**

- Broadening to new markets will improve PC revenue even if the strategy fails
- May not have best understanding of consumer product market
- Won’t design products no-one asked for

**Developmental Goals Notes:**

- Has become more cooperative, coauthoring standards instead of being unilateral

**Industry Analysis**

- Suppliers
- Competitors
  - Entered DSP chip market against TI, but failed
  - Tried to increase price of flash memory by 40%, lost $1 Billion after rivals did not follow suit
o AMD releases Opteron 64 bit microprocessor in 2003
o Wireless: TI and Qualcomm are primary chip designers, Intel focuses on Internet on a Chip (so PDAs need to be successful)
  o Communications:
    o Digital Home: IBM, Sony, Toshiba teamed up, very fragmented industry
    o Communications: Agere, Applied Microcircuits and Motorola support infrastructure companies, pressure from customers to standardize components and lower costs, Intel has 10% of market in 2004, was primary chipmaker for routers, may top out at 15% of $41 billion dollar market
• Buyers
  o Verizon has already signed up for 3G wireless technology, not Wiremax
  o Intel stopped making cameras after complaints from Dell and HP
• Substitutes
• New Entrants
• Complementers
  o In 1994, Intel and HP collaborate on Itanium 64 bit microprocessor

**Functional Map**

<table>
<thead>
<tr>
<th>Year</th>
<th>Consumer Electronics, Wireless Handheld, Communications Equipment</th>
<th>Computer Chip Business</th>
<th>Intel Market Share</th>
<th>Intel Revenue</th>
</tr>
</thead>
<tbody>
<tr>
<td>2003</td>
<td></td>
<td></td>
<td></td>
<td>Communications lost $858 million on $4 billion revenue</td>
</tr>
</tbody>
</table>
| 2004 | $77 Billion Worth of Semiconductors, Intel has 6% (Earning $4.4 Billion Now) | 11% Annual Growth     | • PC & Servers – 83%, $27 billion  
  • Flat Panel TVs – 0%, $10 billion  
  • Handhelds – 50%, $2 billion  
  • Personal Media Players – 0%, $50 Million  
  • Entertainment PCs – 90%, $120 million  
  • Wimax – 0%, $0  
  • Cellular Phones – 20%, $90 billion | Will rise 15% to $34.7 Billion, Profits expected to jump 46% to $8.2 Billion |
| 2009 | If Intel boosts share to 10%, would earn $10 Billion          |                        | 15% Annual growth if strategy pursued |

**Functional Map Notes:**
• Broadband adoption on the rise
• Rapid declines in the cost of semiconductor devices
### Data Processing

**Aggregate Functional Map**

<table>
<thead>
<tr>
<th>Year</th>
<th>2000</th>
<th>2001</th>
<th>2002</th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Intel Capital Investment</strong></td>
<td>Intel Capital gave $150 Million to companies in WiFi Space</td>
<td></td>
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<td></td>
<td>Intel Capital created $200 million fund to support companies involved in the “digital home”</td>
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</tr>
<tr>
<td><strong>Intel Production</strong></td>
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<td></td>
<td></td>
<td>Will be able to produce 375 Million Microprocessors per year</td>
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</tr>
<tr>
<td><strong>Intel Profit &amp; Revenue</strong></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td>R: 15% growth to $34.7 Billion P: 46% growth to $8.2 Billion</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Intel Product Development</strong></td>
<td>Intel stopped making cameras after complaints from Dell and HP</td>
<td>Lost $100 Million after shutting down web hosting</td>
<td></td>
<td></td>
<td>Increased price of flash memory 40%, lost $1 Billion after rivals did not follow</td>
<td></td>
<td></td>
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<td>Will unveil chip based on Wimax</td>
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<td></td>
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<td>Entered DSP chip market against TI, but failed</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>64 bit processors</td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Targeting 10 new product areas</td>
<td></td>
</tr>
</tbody>
</table>
Various Dimensions Over Time

1980 – IBM Enters PC Market
1983 – Compaq Enters PC Market
1989 – 32 Bit Software Market Becomes Significant

IBM Revenue ($billions)
Compaq Revenue ($billions)
Apple Revenue ($billions)
80286 Processor Price ($hundreds)
80386 Processor Price ($hundreds)
80486 Processor Price ($hundreds)
Transistor Count (millions)
CISC Equipped PCs Shipped (millions)
RISCs Shipped (millions)
Intel Revenue ($billions)
Intel DRAM Market Share (10%)
Intel’s Market Position 2004

Intel Market Share 2004

<table>
<thead>
<tr>
<th>Industry</th>
<th>Rest of Market ($ Million)</th>
<th>Intel Share ($ Million)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PC &amp; Servers</td>
<td>23500</td>
<td>20000</td>
</tr>
<tr>
<td>Flat Panel TVs</td>
<td>11000</td>
<td>8000</td>
</tr>
<tr>
<td>Handhelds</td>
<td>1000</td>
<td>5000</td>
</tr>
<tr>
<td>Personal Media Players</td>
<td>2000</td>
<td>1500</td>
</tr>
<tr>
<td>Entertainment PCs</td>
<td>300</td>
<td>250</td>
</tr>
<tr>
<td>Wimax</td>
<td></td>
<td>1500</td>
</tr>
<tr>
<td>Cellular Phones</td>
<td>90000</td>
<td>80000</td>
</tr>
</tbody>
</table>
Conclusion: (Data Analysis)

- **Technology Strategy**
  - Intel began in memory production and development in 1968
  - Competition with Japanese firms with larger economies of scale reduced Intel’s market share (see functional map of Intel’s DRAM market share)
  - Intel’s development of the microprocessor (first designed in 1970) led to more and more R&D being assigned to this branch of the company
  - Technology strategy change came from the middle of the company, DRAM was still pursued from senior management’s perspective until 1986
  - Microprocessor development allowed Intel to sustain its revenue increases
  - Intel stuck with CISC architecture when threatened with RISC, this decision was supported by the fact RISC was not being picked up by PC manufacturers (see functional map – CISC and RISC shipped)
  - In 2001, Intel produced microprocessors with integrated Wi-Fi
  - In early 2000s, Intel invested heavily in semiconductor production facilities to achieve overwhelming economies of scale
  - Also in early 2000s, Intel launched several products into non PC markets for their semiconductor technology, most of which were unsuccessful
  - Intel’s technology strategy has changed from a focus on DRAM, to a focus on microprocessors, and then on to heavily specialising in the field of microprocessors to achieve overwhelming productivity that has enabled Intel to sell their logic products at competitive prices to companies producing things other than PCs

- **Product/Market Strategy**
  - Aggressive marketing strategy in 1980 (Project “CRUSH”) coincides with IBM’s entry into the PC market, this repeats with Project “CHECKMATE” to secure more IBM contracts
  - Intel’s primary buyer shifts to Compaq in 1986 because IBM would not commit to 80386, Intel can effectively play the big buyers (see functional map of buyers revenue) against each other, Intel’s higher revenue (see functional map) suggests more power lies with Intel
  - “Intel Inside” marketing strategy to engage with the end user in 1990 lead to big gains in revenue 1990-1995 (see functional map of Intel revenue)
  - Developed pricing strategy to increase premium on new chip designs to reduce demand when production was being ramped up, this extra profit also helped to cover start-up costs (see functional map, price of different processors)
  - Marketing strategy moved away from PCs in late 1990s, early 2000s as the prices of semiconductor products came down
  - Diversified buyers as Intel produces chips for different types of products, e.g. phones, TVs, communications equipment
  - Intel’s product/market strategy has changed from having buyers only in the PC industry to having buyers in many different industries that rely on semiconductor products. Its current efforts are to increase its market share in these non-PC areas.

- **Development Goals**
  - Development goals from 1968 to early 2000s remained constant, be the first to market with the best product
  - This goal was not achievable in DRAM, but was achievable in microprocessors
  - Intel did not officially realise this fact until 1986, when its share of the DRAM was insignificant
- Practically, the development of the company had shifted towards the ‘logic’ side of the business before the official stance changed, so Intel was well positioned to take advantage of conditions within the industry (using clever marketing and buyer manipulation) to emerge as the star player.
- As the PC market for semiconductors matured, other industries opened up that required logic, in the early 2000s Intel was trying to develop into a supplier for many different industries, and in some cases selling directly to consumers.
- Intel’s goals have changed from dominating the PC semiconductor industry to diversifying their products and buyers to participate in more markets.

**What technologies/products should Intel pursue?**

- Cellular phone semiconductor component manufacture – this market is huge, and suited to Intel’s current specialisation.
- Chip supply and design for home entertainment PC – this market is expected to grow in the future, and is also suited to Intel’s current specialisation.
- Chip supply and design for portable PCs (netbooks) – the success of Intels Wi-Fi capable chips as well as Intel’s familiarity with computer technology, as well as the market potential, make this an attractive technology to develop.