

Andersen Telecom A/S

A bright summer morning in early July 2000, Sven Andersen, the vice president of Logistics at Andersen Telecom A/S, Europe's third largest manufacturer and producer of mobile telephones, was sitting in his corner office at the company's world headquarters in Copenhagen, Denmark, staring out his window at the harbor. Sven was contemplating how his company could increase its presence in the ever-growing wireless phone market of North America.

Sven has studied the rules of the North American Free Trade Agreement and the recently implemented free trade agreement between the European Union and Mexico, and hopes that Andersen Telecom can take advantage of these agreements. Currently, Andersen Telecom maintains a rather modest 3% of the Mexican market, a ten percent share in the US, with the majority of sales in Europe where they enjoy a healthy 20% market share. One of the options he is considering is acquisition of Mextronics, a major electronic and telephone supplier in Mexico.

Most of Andersen's product line consists of phones using the GSM (Global System for Mobile Communications) technology. GSM is an open, non-proprietary system, which allows mobile users to roam in more than 168 countries, making and receiving calls on one handset and with one global number. GSM technology now accounts for more than 70% of the world's digital mobile phones. The three other digital technologies combined account for the remaining 30%. More than half a billion GSM mobile phones are now in use worldwide.

Nearly 80% of all GSM customers are outside of Europe, reflecting the increasing globalization of GSM as the standard. GSM usage in the Americas alone is expanding at an exponential rate. There are already more than 150 million GSM phones in North America. It is this growing market that Andersen Telecom hopes to capitalize on.

The Market

Phone manufacturers got some encouraging news from market analysis firm Gartner Dataquest, which projected a 40% increase in global mobile phone sales in 2001 (See Table 1). GSM Cell phone sales are predicted to reach over 532 million units for 2001, but the rate of growth will be down from 2000, when worldwide sales increased 45% over 1999 levels.

The most active mobile phone market during 2000 was the Asia-Pacific and Japanese region topping the market with 98.9 million units, while Western Europe had shipments of 79.3 million units. The US and Canada are close behind Western Europe with 68.1 and 62.2 million units respectively. Table 2 shows the worldwide mobile phone sales and % market share for the eight largest mobile phone manufacturers.

Table 1

Projected Worldwide GSM Telephone Sales (Millions of Units)						
	2000	2001	2002	2003	2004	2005
Western Europe	79.3	111.0	143.2	176.2	195.5	209.2
Japan	98.9	138.5	178.6	219.7	243.9	260.9
United States	68.1	95.3	123.0	151.3	167.9	179.7
Canada	62.2	87.1	112.3	138.2	153.4	164.1
Mexico	23.5	32.9	42.4	52.2	57.9	62.0
Latin America	48.0	67.2	86.7	106.6	118.4	126.6
Totals	380.0	532.0	686.3	844.1	937.0	1002.6

Table 2

Worldwide Mobile Phone Sales Estimates for 2000 (Thousands of Units)

Company	1999 Shipments	1999 Market Share (%)	2000 Shipments	2000 Market Share (%)	Growth (%)
Nokia	76,335	26.9	126,369	30.6	65.5
Motorola	47,818	16.9	60,094	14.6	25.7
Ericsson	29,785	10.5	41,467	10.0	39.2
Andersen	20,000	7.1	35,000	8.5	75.0
Mextronics	25,000	8.8	30,000	7.3	20.0
Siemens	12,982	4.6	26,989	6.5	107.9
Panasonic	15,581	5.5	21,511	5.2	38.1
Samsung	17,687	6.2	20,639	5.0	16.7
Others	38,393	13.5	50,662	12.3	32.0
Total Market	283,581	100	412,731	100	45.5

Source: Gartner Dataquest (February 2000)

Supply Tops Demand

"The rapid annual growth rates of the past several years concealed numerous operational and strategic weaknesses among global handset manufacturers," said Bryan Prohm, a senior analyst for Gartner Dataquest. "However, these deficiencies are now being fully exposed, thanks to a more challenging business environment.... Supply has finally surpassed demand," Prohm added, "and although sales growth will continue, only those manufacturers with a strongly differentiated offering will continue to thrive."

Mobile Data Services

Sven had recently read a study published in a British financial newspaper, which reported that the ratio of mobile telephone users to desktop internet users is currently at two-to-one. The study went on to predict that by 2005, when the number of mobile users is expected to top one billion, the ratio will exceed three-to-one. The number of mobile telephone users exceeds the number of desktop internet users in all regions except North America.

The huge popularity of the Short Message Service (SMS) service on GSM helps makes it clear that a market for mobile data services exists. Developing a mobile device capable of wireless internet access shows great market potential.

Andersen Telecom's latest product, the Antel 2010, is a fully integrated cell phone with the latest technology for Internet and web based communication. The phone also features a large display, a Nava-roller for easier browsing and selecting of menu items, predictive text inputting, an organizer, and phone & address book. The predictive text-inputting feature uses the phone's built-in dictionary to continually compare the word being typed with the words in the database. It selects the most likely word for the inputted letters. If there are several possibilities when finished typing the word, the user selects the desired one using the Nava-roller.

Wireless Application Protocol (WAP)

WAP, or Wireless Application Protocol, is an open standard protocol that provides access to Internet content and advanced Value Added Services – such as e-mail, e-commerce and information services – on hand-held devices such as mobile phones and personal digital assistants (PDAs).

WAP services include both consumer and corporate solutions, such as e-mail, corporate data, news, sports and information services, entertainment, TV/movies, travel, leisure, culture, medical care, electronic commerce, and banking services.

WAP was designed and is maintained by the WAP Forum, which was created in 1998 through the joint efforts of Andersen, Ericsson, Motorola, and Nokia. Today, the WAP Forum includes more than 100 members ranging from handset manufacturers to consulting firms.

WAP enables wireless users to access interactive data services through a microbrowser on their handsets, which is responsible for processing bytecode sent to it by the WAP gateway. The WAP gateway creates the interface between the Internet and the WAP browser. In a typical WAP transaction, the browser sends a request to the gateway, which then sends a request to the respective Web server on the Internet; the Web server responds to the gateway with the requested Wireless Markup Language (WML) file. (See **Exhibit 1** for additional information on WAP.)

The Microbrowser

The client software that enables WML content browsing is known as a microbrowser. A microbrowser is software manufactured on a chip, and sold to a handset manufacturer, which then builds the WAP browsers into its products.

Opennet Systems, headquartered in Houston, TX, is one of the leading microbrowser manufacturers, with operations located in Mexico. Most WAP phones and wireless PDAs use Opennet's microbrowser, though some handset manufacturers, such as Nokia and Andersen, make and ship their products with their own superior microbrowsers; however, it appears that Opennet has made operational improvements to triple their already ample capacity

Preliminary studies in the European market have shown that brand loyalty in mobile phones is high. However when it comes to the new WAP enabled phones, consumers prefer the Nokia and Andersen proprietary microbrowser technology. Andersen's new phone, the Antel 2010, will be WAP enabled with the latest Andersen microbrowser. Andersen expects to sell the phones to their worldwide dealers for \$16.00.

The Mexican Connection

Mextronics is Mexico's leading provider of end-to-end Electronics Manufacturing Services (EMS) to Original Equipment Manufacturers (OEMs) in the communications industry. Currently Mextronics has two wireless mobile phone manufacturing facilities in Mexico: one in Chihuahua, northern Mexico, and one in Tlalnepantla, near Mexico City. In addition, they own a 124-acre Industrial Park in Guadalajara, located near Mexico's west coast.

Mextronics markets its phones under the Skytag brand name, wholesaling at \$16. The Skytag phones enjoyed an 8% share of the Mexican market in 2000. 6% of the US and the European markets each prefer the Mextronics offering, which is marketed under the Talkport brand.

Mextronics has not enjoyed the same growth in sales as Andersen, primarily due to their limited success in obtaining the license for a microbrowser. With the anticipated growth in popularity of WAP enabled phones, fitting the next generation of Skytag phone with a browser is crucial to Mextronics survival. Therefore, they have negotiated a three-year deal with Backlight Systems, which provides them with a limited browser to meet the market demand. To meet this demand, Mextronics had to commit to Backlight's Japanese produced microbrowser exclusively through the end of December 2003, with a \$16 million contract penalty.

The new WAP-enabled Skytag phones, with the Backlight technology, will have a three-line display. PDAs using Opennet technology have displays showing more than five

lines. So far, the worldwide market tends to favor the larger display, wireless enabled PDAs over cell phones for mobile data services.

Shifting to the Antel 2010 could result in a fortunate break into the North American market, where sourcing and duties have kept Andersen's market share at bay (10% in the US and 3% in Mexico). With the Mexico European Union Free Trade Agreement newly enacted, Sven has been pondering whether this is a viable opportunity for Andersen to spark a deal with Opennet to make Antel 2010s in Mexico with either the current line offering, or the newer five line display. By marketing the newer five-line technology, Andersen believes it can increase its US market share by 80% and the European and Mexican sales by 10% over current levels. With contracts and duties in the balance, the question remains whether Andersen can capitalize on this market as well as when the right time would be to do so.

Free Trade Agreements

The North American Free Trade Agreement (NAFTA) entered into force between the U.S., Canada, and Mexico on January 1, 1994. NAFTA has among its goals to define clear and advantageous rules governing trade between the U.S., Canada, and Mexico, to eliminate barriers to trade, and facilitate the cross-border movement of goods and services among the parties. These agreements are to be based on certain general principles, including national treatment, most favored nation treatment, and transparency.

In addition, the NAFTA also eliminated the Maquiladora, or Free Trade Zone benefits that Mexico provided to attract companies to use their labor resources. The Maquiladora enabled companies to temporarily export raw materials (duty free) into Mexico provided they could demonstrate that those raw materials were used to produce a finished good that was in turn re-exported. Any goods remaining in Mexico would have to be imported and potentially subject to a duty.

Mexico, however, established trade programs in certain critical business sectors (Sector Program) to keep import duties for raw materials at a minimum. Fortunately for Andersen, the Sector Program will provide duty free importation of raw materials.

The goal of facilitating cross-border movement of goods becomes somewhat blurred when one is analyzing the complexity and intricacy of NAFTA rules of origin. (See **Exhibit 2** for specific NAFTA rules of origin.)

The European Union (EU) was formed to provide a process of political and economic cooperation and integration among the nations of Europe. The EU began as the EC (the European Community) in 1951, with six European countries: Belgium, Germany, France, Italy, Luxembourg and the Netherlands. Then in 1973, Denmark, Ireland, and the United Kingdom joined. Next to join was Greece in 1981, followed by Spain and Portugal in 1986, and Austria, Finland, and Sweden in 1995. Following the Maastricht-treaty, which entered into force on November 1, 1993, the EC became the present EU.

Today the EU has fifteen Member States and is preparing for its fifth enlargement, to include nations in Eastern and Southern Europe.

The EU-Mexico Free Trade Agreement is an interim agreement on free trade between the European Community member states and Mexico; it entered into force on July 1, 2000. The Free Trade Agreement, similar to NAFTA, seeks to open up trade in services, investment and some aspects of intellectual property rights, between the EU and Mexico. Free trade already exists among the 15 EU member states.

The EU-Mexico FTA also eliminated Maquiladora benefits for European-based companies. This move rendered Maquiladora benefits, at least from a duty perspective, moot. The Sector Program also applies to European based companies.

Rules of Origin

Originating goods are those that, under a regional trade agreement, meet the preferential rules of origin applicable, i.e. they have sufficient regional content to qualify for preferential treatment. Criteria to establish originating goods may vary in nature and complexity, depending on whether the goods are wholly produced or obtained in a member country, or whether the goods have undergone a substantial transformation and/or a shift in their tariff classification.

Under NAFTA there is an originating clause, requiring the parts and the final product to have 60% North American value-content in order to be considered a NAFTA qualifying item. The EU-Mex trade agreement requires that only 40% of the content originate in one or more of the member states of the European Community or in the United Mexican States.

Prior to the new EU-Mex trade agreement, the high level of applied tariffs for electronic products, at 25% to 35%, was considered by Mexican importers as a strong barrier to trade, in particular for high-tech manufacturing. It is alleged that Mexican consumers interested in such products would purchase them at a lower price in the US, where tariffs range around 3% for electronic goods imported to the US, or buy similar US manufactured items, imported into Mexico at the NAFTA preferential rate. With the playing field leveled for European goods, duty benefits are an area that Andersen Telecom hopes to capitalize on.

Customs Duty

Customs duty (or tariff) is paid on all goods (raw materials and finished goods) that are imported into a country, unless exempted from such through Free Trade Agreements. All goods have a HTS (Harmonized Tariff System) Code classification. HTS is a system for classifying goods in international trade, developed under the auspices of the Customs Cooperation Council. This HTS contains descriptions, duty rates, and codes for all commercial items. In the course of business, imported and exported items are typically referred to by their "HTS number" or "classification." Classifications not

only identify the duties to be paid for imports from a country, but also the Rule of Origin to be applied to the goods when determining duty benefits.

Value of Imported and Locally Manufactured Goods

The value of imported goods and locally manufactured goods is subject to the ad valorem rate of duty, determined according to the good's normal price. The normal price refers to the price that the goods would fetch at the time when the duty becomes payable on a sale in the open market between the buyer and the seller independent of each other.

The following elements are taken into account in assessing the duty payable:

- (a) HTS code,
- (b) Cost (or sales price),
- (c) insurance,
- (d) freight,
- (e) handling charges (if imported by sea or air),
- (f) all other charges incidental to the sale and delivery of the goods, e.g., commission, documentation, packing, etc.

In the case of mobile phone assemblies, the duty payable will be for the finished product when exported, should the phone not qualify under a free trade agreement. Valuation of a mobile phone for duty purposes is \$16.00.

Value Content

The value content of a good is used to determine the amount of duty payable if any, and whether the good qualifies under a free trade agreement. For a mobile phone assembly, the value content divides as shown in Table 3.

Table 3
Value Content of Mobile Phones Manufactured in Mexico and Europe

	Mexico		EU	
	Value	Percentage	Value	Percentage
Raw Materials	\$8.48	53%	\$5.60	35%
Microbrowser	\$5.60	35%	\$5.60	35%
Labor & Overhead	\$1.12	7%	\$4.00	25%
Markup	\$0.80	5%	\$0.80	5%
Total	\$16.00	100%	\$16.00	100%

Electronic goods imported to the United States are typically subject to a 3% duty, while the same good are taxed at 12% in the EU. To protect its manufacturing interests in producing mobile phones, Mexico has set the tariff to 24%.

The Takeover

Sven had already begun an analysis to look at the benefits of purchasing Mextronics. By taking over Mextronics operations and establishing themselves in Mexico, Sven expects Andersen Telecom to become a larger player in the North American market. Sven also hopes that Andersen products manufactured in a Mexican plant would qualify as NAFTA goods, eliminating the existing tariff barriers the company currently faces in North America.

If Andersen begins to manufacture the three line browser phones in Mexico, operating under the current Mextronics contract with Backlight, Andersen should expect to shift its current raw material content percentages from 10% (Japan), 1% (Mexico), 4% (US), and 20% (Germany) for its plants in Europe to Mextronics' current sourcing strategy of 23% (Japan), 10% (Mexico), 18% (US), and 2% (Germany) in Mexico. Additionally, Andersen will source its browser from Backlight's source in Japan and reduce its labor costs for the first three years. However, benefits gained in using Mextronics strategy will be consumed by an increase in raw material costs (Labor & Overhead reduces to \$1.12 from \$4.00, while raw materials shift to \$8.48 from \$5.60 (See Table 3). Andersen expects to see a shift in sourcing to 10% (Japan), 8% (Mexico), 15% (US), and 20% (EU) in 2004 and 2005 (based on the Mextronics raw material cost model) as it switches to the new five line technology offered by Opennet. If they opt for the five-line browser immediately, Andersen could expect to use this same strategy of sourcing immediately.

There are some challenges to be faced however:

- Mextronics' three-year deal with Backlight Systems. Andersen Telecom believes in its own microbrowser technology, and would want to include them in the next generation of Mextronic phones. A substantial penalty (\$16 million payable over three years) would have to be paid to Mextronics Systems to opt out of the deal.
- WAP enabled phones have yet to catch on in the US, due to the slow data speeds incurred over the current digital networks in use in North America.
- There is currently a lack of a single standard for digital cellular network in the United States.
- Challenges on the interpretation of NAFTA and the EU-Mex trade agreements, both among employees and government authorities.
- With margins on the product so small, duty rates can impact the profit of the company tremendously.

Sven Andersen will attend the annual shareholders meeting of Andersen Telecom, held at the Tivoli Garden's congress hall on Thursday, and he needs to prepare a proposal for the board and the shareholders. He would like to show the benefits of a takeover of Mextronics. The proposal should advise whether or not to bid for Mextronics, and if so, when should they move to the newer technology.

Appendix

Exhibit 1: How WAP Works

WAP consists primarily of two components. The first is the all-important WAP browser, which is responsible for processing bytecode sent to it by the WAP gateway. (Figure 2.) The WAP gateway creates the interface between the Internet and the WAP browser. In a typical WAP transaction, the browser sends a request to the gateway, which then sends a request to the respective Web server on the Internet; the Web server responds to the gateway with the requested WML (Wireless Markup Language) file.

The gateway encodes the file into bytecode, which is then transmitted to the WAP browser. Next, the browser decodes the bytecode and displays the requested Web site. Because bandwidth on wireless networks is limited, bytecode is used to transmit the WML file instead of just transmitting the raw WML file.

WML works well for WAP devices because it is a fully compliant XML (Extensible Markup Language)-based language. It provides better efficiency than HTML because of its use of the deck concept. To understand this, think of a deck of cards. A single WML file contains a deck with multiple cards. Each card is a separately displayed screen, depending on the input from the user. Unlike with plain HTML -- where every link you click on downloads a new HTML file -- a single WML file contains many pages or cards. This reduces unnecessary downloading.

TYPICAL WAP TRANSACTION

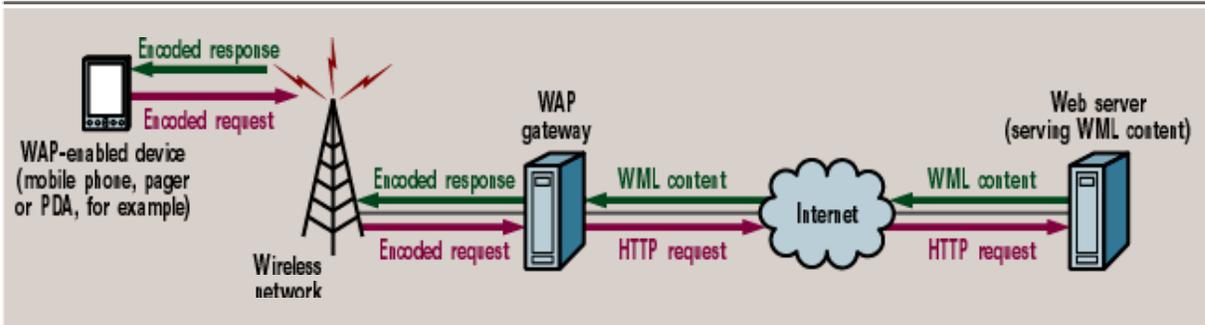


Figure 2 (Source: Network Computing)

Exhibit 2: NAFTA and EU-Mex Trade Agreements

Rules Of Origin

Under the general rules of NAFTA, there are four main origin criteria, i.e., four ways in which goods generally meet the NAFTA rules of origin:

1. Goods “wholly produced or obtained” in the NAFTA region (no non-NAFTA parts or materials). This criterion typically applies to raw materials or goods made directly from raw materials. Further manufactured goods do not fall into this category unless the producer can trace all inputs back to raw materials originating in North America.
2. Goods containing non-originating inputs, but meeting the Annex 401 rules of origin. Goods made from non-originating materials may also qualify for NAFTA treatment as long as each non-NAFTA input undergoes a tariff classification change as specified in NAFTA Annex 401, and meets other requirements that may apply. Under Annex 401 (specific rules of origin) rules of origin may be based on a change in tariff classification, a regional value content requirement, or a combination of both approaches.
3. Goods produced in the NAFTA region wholly from originating materials, i.e., produced from materials that may contain non-NAFTA materials, but meet the NAFTA rules of origin.
4. Unassembled goods and goods classified in the same HTS category as their parts, which do not meet the Annex 401 rule of origin, but contain sufficient North American content. Under two limited circumstances, if a product fails to qualify under product-specific tariff- shift rule of origin, it may qualify under a regional value content requirement, even if the product-specific rule of origin in Annex 401 does not contain a regional value content provision.

These two circumstances apply when the good is produced entirely in the territory of one or more NAFTA countries, but one or more of the non-originating materials do not undergo a change in tariff classification because

- (a) the good was imported into North America in an unassembled or disassembled form, but was classified as an assembled good under the HTS system,
- (b) parts and the final product are classified under the same heading or subheading.

In these two situations, no tariff shift is possible because of how the goods are classified. However, goods in this situation may obtain NAFTA tariff preference if they have 50 or 60% North American value content, depending on the method used (net cost or transaction value).

EU-Mexico Joint Council

The EC-Mexico Joint Council signed an Interim Agreement on Trade and Trade-related matters, which covers all the trade aspects of the Economic Partnership. The Economic Partnership, Political Coordination and Cooperation Agreement entered into force on July 1, 2000. The agreement is between the European Community and its Member States, of the one part, and the United Mexican States, of the other part.

The provisions of the agreement concern the elimination of customs duties on imports, and apply to products originating in the territory of the parties. As defined by the agreement: "A customs duty includes any duty or charge of any kind imposed in connection with the importation or exportation of a good, including any form of surtax or surcharge in connection with such importation or exportation."

Article 3 of the Interim Agreement provides that the Joint Council shall decide on the arrangements and timetable for a bilateral, progressive and reciprocal liberalization of tariff and non-tariff barriers to trade in goods, in accordance with Article XXIV of the General Agreement on Tariffs and Trade 1994 ("the GATT 1994").