

## MKTG 464: Individual Assignment 3

# Conglomerate Inc.'s New PDA

By Gary L. Lilien and Katrin Starke

### Introduction

Conglomerate Inc., a major U.S. wireless carrier, has teamed up with a PC manufacturer to form a joint venture, Netlink, to develop, produce and market a hybrid product integrating a Personal Digital Assistant (PDA) with a "smart" cellular phone. Its first product is tentatively called ConneCtor. ConneCtor directly transmits and receives both data and voice. Its operating system is the PalmOS, which is common in PDAs. Thus, ConneCtor allows the user, among other things, to access the standard tools of Personal Information Management (PIM) and also performs standard cell phone functions.

ConneCtor can send and receive faxes and e-mail, access the Internet, and record voice messages. Users can input data into the PDA in the following ways:

- By using the on-screen keyboard
- By using the numerical keypad
- By writing on the screen (using handwriting recognition software)
- By speaking into the phone, using a voice recorder.

An additional feature of ConneCtor is its ability to establish wireless links to other ConneCtors for voice and data transfer or to cell phones for voice transfer. For direct data transfer, the product includes an infrared port and also ships with a USB synchronization cradle. In summary, the key features of ConneCtor are:

- Instant communication for voice and data
- Cell phone, pager, fax and e-mail, and instant messaging
- PIM functions
- Digital voice recorder
- Enabled voice commands
- PalmOS application base.

## **The History of the PDA**

The Personal Digital Assistant (PDA) is basically a hand-held computer. In 1984, the first PDA, the Psioni, was introduced. It could store addresses and phone numbers, keep a calendar, and included a clock and calculator. In 1993, Apple introduced the Newton PDA, which was too bulky, too expensive and had handwriting recognition too inaccurate to be successful. However, the excitement surrounding the Newton hinted that there could be a market for such devices. The broad acceptance of PDA technology then materialized in 1996, when Palm Inc. came out with the Palm Pilot that featured an elegant user interface and a reliable character-recognition system.

By 2001, PDAs had evolved to offer many applications including wireless Internet capabilities, games and music playback. PDAs are designed for very specific tasks and environments: there are custom-built PDAs for amateur astronomers, truck drivers and teachers. In addition, there is specialized software available to fit specific needs; for example, people in the medical field can obtain software that lists thousands of drugs with their dosages and interactions.

## **PDA Types**

The 2001 palm-sized PDA market was mainly composed of two types, each with its own philosophy: (1) the PDA/Palm devices run PalmOS, whose developers sought to make PDAs simple but functional products focusing on Personal Information Management (PIM) tasks; (2) the PDA/Pocket PCs run the more complex operating system, Microsoft Windows CE, which allows these PDAs to offer extensive features. In addition, "smart" phones are breaking into the PDA world. These wireless application protocol phones extend traditional cell phones with PDA functions such as email and Web access.

The original Palm Pilot embodied the PDA/Palm design mission. It provided a simple organizational device, composed of a calendar, an address book and a to-do list with e-mail and Internet access. It also had a character-recognition system that worked for most people. Handspring, Palm's biggest competitor, introduced snap-on modules

to expand the Handspring Visor and allow many applications, including an MP3 player, a web cam and digital camera. These features appealed to the youth market and enabled Handspring to gain considerable market share. In 2001, Palm also offered this same degree of expandability and was able to maintain a market share of more than two-thirds; in addition, all of Palm's close competitors licensed its operating system, PalmOS. Several electronic manufacturers have developed similar devices; for example, Sony introduced Clie as a direct competitor to Palm and Handspring.

PocketPCs make up the other group of PDAs, whose manufacturers include Compaq, Hewlett-Packard, Psion and Casio. These hand-held computers come with a large application suite of pocket Windows applications, e.g., a scaled-down version of MS Office. They usually come with more memory than PDA/Palms and with a range of accessories to be added to the devices (e.g., digital cameras, web cams). In contrast, PDA/Palms perform basic tasks very well and, unlike the PocketPCs, synchronize with non-Windows systems.

A new technological thrust in 2001 involved the adoption of wireless technology for the PDA with manufacturers trying to assess if and how to add wireless capabilities. Wireless technology would make synchronization possible without docking, making PDAs true communication tools. AT&T, Nokia and other cellular phone

companies have started developing wireless phones with some PDA functions.

## **The PDA Customer**

As PDA designs have evolved, manufacturers have targeted different segments based on differing lifestyle and business needs. Palm initially captured innovators - people eager to adopt a new gadget. A typical early PDA user was a professional, high-income male. He was over 30 and probably worked in a technology field. Even as of September 2000, 93 percent of PDA users were male, according to IDC, a Massachusetts technology consulting firm.

Another major group of users is the mobile professional. Since this group frequently needs access to e-mail and the Internet while away from the office, it is also driving progress on the wireless front. A recent study by the University of California at Berkeley indicated that nearly half of the users had a technical job dealing with computers, and the overwhelming majority of the respondents rated themselves as technically sophisticated.

To attract more mainstream buyers in 2001, companies were working on increasing the usability of the PDA and its general appeal to nonbusiness users. For example, the new Claudia Schiffer Palm (sold via her Web site) is supposed to give Palm a sexier image, and Handspring's Visor line comes in many colors. Palm's affordable

M series (\$150) targets college students and other nonprofessional consumers. It is expected that such efforts will eventually open up the largely untapped young consumer and female market.

However in 2001, it appeared unlikely that the bulk of the mainstream population would enthusiastically embrace the PDA. A PDA was still relatively pricey and fairly limited. Handwriting recognition was slow and lacked quality. Internet connections were generally both slow and expensive. In addition, the mainstream market appeared to have little need for many of the more sophisticated features the PDAs were able to offer.

## **PDA Features**

Given all the available design options, new product entries must make trade-offs between features as PDA users' needs are heterogeneous. Those who are looking for a high-tech way to store contact and appointment data may be satisfied with the basic models that cost \$200 or less. They also are likely to prefer to keep a PC and cell phone separately rather than having an integrated PDA that could do both. Users who plan to use the PDA as an extension of a PC by creating and accessing documents, sending e-mail, and doing basic Web surfing, might consider a Pocket-PC in the range of \$350-\$600. The appendix provides more details on PDA features.

## **Facts about the PDA Market**

In 2001, many companies participated in the PDA market, bringing in a variety of new products designed to appeal to new audiences. The market was changing and growing rapidly. PDA unit sales totaled 1.3 million in 1999 and more than doubled, totaling 3.5 million in 2000. In December 2000, the top five PDA brands in the United States were (Source: NPD INTELECT):

<b>Rank</b>	<b>Brand</b>	<b>Unit Share</b>
1	Palm	72.10%
2	Handspring	13.90%
3	Casio	6.00%
4	Hewlett Packard	2.30%
5	Compaq	2.00%

The prices for PDAs have been relatively stable. According to NPD INTELECT, the average price of a PDA was \$324 in 2000, down from \$350 the year before.

## **The HVC Survey**

Netlink's management hired a market research firm, Happy Valley Consultants (HVC), to collect information about the needs of ConneCtor's potential customers. Netlink wants to use the data that HVC collected to identify segments within the market

for PDAs, to target appropriate segment(s) for ConneCtor, and to position ConneCtor in the chosen segments.

For the targeting task, Netlink recognized that it had to develop criteria for segment selection. Using the items in Exhibit 1 as a starting point, Netlink identified two sets of key targeting criteria:

- Product-target market fit, in terms of Conglomerate's technical strengths, market needs and the ability of the current (or future) ConneCtors to meet those needs.
- Segment size and growth expectations, including both first purchases and upgrade/replacement buys.

## **The Questionnaire**

HVC surveyed the market, looking at a range of occupation types. The survey included screening items that asked respondents if they had or would consider a PDA and if their job included time away from the office. Only those respondents who answered affirmatively to these questions were retained for further analysis.

The questionnaire asked the respondents to provide data on two kinds of variables: segmentation-basis or Needs variables (X1 – X10) that can be used to find consumer segments, and demographic and technology use variables (Z1 – Z7) that can be used to discriminate between segments or to target certain segments.



**Survey questions for finding segments: Needs variables (X1–X10)**

X1. Whenever new technologies emerge in my field, I am among the first to adopt them. (1 = Strongly disagree ... 7 = Strongly agree)

X2. How often do you use a pager or an Instant Messaging service?  
(1= Never ... 7 = Very often)

X3. How often do you need to use a cell phone for making official or work related phone calls?  
(1= Never ... 7 = Very often)

X4. How often do you use personal information management tools; e.g., scheduler, contact-management tools, to-do list?  
(1 = Never ... 7 = Very often)

X5. How important is it for you to share information rapidly (e.g., synchronize information) with other people, e.g., colleagues?  
(1 = Not at all important ... 7 = Very important)

X6. How important is it for you to have constant access to e-mail, permanent Web access (e.g., real-time stock prices, news) and access to multimedia features; (e.g., music, video and games)?  
(1 = Not at all important ... 7 = Very important)

Question X7 – X9 relate to occasions when you are away from your office (including remote locations)...

X7. How often do others send you time-sensitive information?

(1 = Never ... 7 = Very often)

X8. How often do you have to send time-sensitive information?

(1 = Never ... 7 = Very often)

X9. How often do you need remote access to information?

(1 = Never ... 7 = Very often)

How much would you be willing to pay for a PDA with the following features: instant communication from PDA to PDA, cellular phone, instant messaging, instant file sharing, e-mail, Web access, fax, personal information management features (e.g., scheduler, address book)?

X10. Invoice price for the PDA device with all the features?

*Survey questions for discriminating between segments*

Z1. Age

Z2. Education

(1=High school, 2=Some college, 3=College graduate, 4=Graduate degree)

Z3. Income

Z4. How often do you spend time away from the office?

(1 = Rarely ... 7 = Almost every day)

Z5. Type of industry or occupation: (0 = No, 1 = Yes)

Z5\_1 Construction

Z5\_2 Emergency (fire, police, ambulance, etc.)

Z5\_3 Sales (insurance, pharmacy, etc.)

Z5\_4 Maintenance and Service

Z5\_5 Professional (e.g., executive, lawyers, consultants)

Z5\_6 Computer (Computer programmer / software engineer)

Z6. Do you own a PDA? (0 = No, 1 = Yes)

Z7. Do you own or have personal access to a desktop/notebook computer? (0 = No, 1 = Yes)

Criterion	Examples of Consideration
<b>I. Size and Growth</b>	
1. Size	• Market potential, current market penetration
2. Growth	• Past growth forecasts of technology change
<b>II. Structural Characteristics</b>	
3. Competition	• Barriers to entry, barriers to exit, position of competitors, ability to retaliate
4. Segment saturation	• Gaps in the market
5. Protectability	• Patentability of products, barriers to entry
6. Environmental Risk	• Economic, political, and technological change
<b>III. Product-Market Fit</b>	
7. Fit	• Coherence with company's strengths and image
8. Relationships with other segments	• Synergy, cost interactions, image transfers, cannibalization
9. Profitability	• Entry costs, margin levels, return on investments

**Exhibit 1:** Some suggested criteria to use when evaluating segment attractiveness: use the ones that are most appropriate in your industry and for your business problem.

## Appendix: PDA Features Guide

**Operating System:** There are a number of different operating systems (OS's) used for PDAs. The two main OS's are PalmOS and Windows CE from Microsoft. Both license their systems to other manufacturers. Another system, EPOC from Symbian, is especially prevalent in Europe. Some manufacturers, such as Apple (Newton), use proprietary operating systems. A PDA should be compatible with the user's desktop computer. When using a PDA in a corporate environment, it is important to have compatibility with other PDAs; that way, co-workers using the same OS can swap data more easily.

Windows CE is basically a mini version of Windows, similar in look and feel to Windows 95/98. PocketPCs typically run Windows CE that Microsoft released for small devices like PDAs and set-top TV controllers. PocketPCs can only directly synch with other MS operating systems; i.e., this poses a problem for Mac users.

Palm OS is most common with palm-sized PDAs, none of which come with a built-in keyboard. Developed by 3Com/Palm Computing, this is the OS for all Palm models, certain IBM Workpad models and the Handspring Visor. The Palm OS is simple, speedy and easily customizable via third party software and shareware programs. Its Palm OS is compatible with Windows, Mac, OS/2, Unix and Linux given the right software.

EPOC is an OS developed by Symbian, a joint venture of Psion, Ericsson, Motorola, Nokia and Matsushita. This OS is used for mobile wireless devices like smart phones as well as PDAs. In many ways, this OS resembles Windows and is fully Windows compatible. However, EPOC tends to run faster and use less power than Windows CE. With the proper software, EPOC also supports Mac, Psion, Ericsson and some others.

**Memory:** PDAs need memory to store the operating system, standard applications, additional software, data, etc. Although more memory is usually better, storage capacity between models with different operating systems should not be directly compared, e.g., a PalmOS running model with 4 MB of RAM will store more data than a 4 MB model running

Windows CE. To allow more applications to run, the memory of many PDAs can be upgraded. Other PDAs support removable storage like CompactFlash. However, greater memory leads to shorter battery life.

**Synchronization:** Synchronization refers to the two-way process that exchanges and updates information between the PDA and the user's computer. The connection can be via cable or via the Infrared port. Most devices come with a special stand or cradle that facilitates synchronization and often recharges the PDA's batteries.

With the right software and appropriate connection, a PDA can sync with a PC remotely; for example, PDAs can access and synchronize with data stored on a corporate network. Other programs allow syncing over the Internet by keeping the information on a web server. When using the same OS, users swap information by syncing their PDAs with another user's devices.

**Batteries:** Most PDAs come with rechargeable batteries, and many also work with regular alkaline batteries. Among the rechargeable batteries, Lithium-ion-based ones are the most expensive, but they hold their charge longer when not in use. Battery life also depends on how extensively the PDA is used. Monitoring the life of the battery is useful to avoid losing all data in case of power failure.

**Modem and Online Services:** Mobile access to the office/home PC is possible with a PDA modem or cable adaptor. Most PDAs support at least optional modems. For complete mobility, a wireless modem and wireless network access are needed.

**Web:** There are several special Web browsers for PDAs that reformat regular Web content so it can be viewed on a PDA. "Web clipping" services exist that answer requests by sending back stripped down "clips" of information from participating sites. Other applications, like ProxiWeb, use proxy servers to reformat Web content before it gets sent. Lastly, PDAs can be used to download web content for offline viewing - even if the PDA does not have a modem; every time the user synchronizes the PDA, the Web content is updated through the user's PC Internet connection.

**E-mail, etc.:** A PDA can be used to read, write, send and receive e-mail either by synchronizing e-mail with a desktop or directly online by using a modem. The writing of e-mails, however, is cumbersome on most PDAs, especially if there is no keyboard. Applications also exist for Usenet and instant messaging.

**Handwriting Recognition:** PalmOS-based devices and PocketPCs come with a touch-screen and handwriting recognition software for writing text. PDA/Palm handwriting recognition programs require that the user learn a predefined set of pen strokes to form characters. Some handwriting programs let the user customize standard pen strokes to suit the user's writing style. For Windows CE, there is a full recognition application (no pen strokes to learn) available that allows writing anywhere on the screen, but recognition is slower and uses more memory.

**Other Software:** A PDA comes bundled with a variety of software: e.g., synchronization software, PIM applications (calendar, addresses, to-do-list, etc.) and handwriting recognition software. In addition, there is plenty of third-party commercial software, shareware and freeware available - at least for PalmOS, Windows CE and EPOC, but not for PDAs with a proprietary OS.

**Accessories:** Sync cradles or cables are usually included in the price of the PDA. Internal modems are sometimes included in the upfront price, but add-on or wireless modems are extra. Other accessories include small keyboards for palm units, AC adapters and styluses that double as pens and bar scanners. Protective screen overlays or carrying cases are also available to increase durability and style.

**Audio:** PDAs have differing audio capabilities. Virtually all have built-in speakers for alert noises. Others have internal microphones for recording notes or limited voice recognition uses. Depending on the device, there may be jacks for headphones or external microphones. Audio features will be especially important for users who want to use a PDA for multimedia purposes, e.g., watching video clips or listening to MP3s. In general, PocketPC units offer more audio features, although there are add-on audio accessories for PalmOS devices as well.

## QUESTIONS

- Data for this assignment is in the file, 'Connector\_pda.csv' in Canvas
  - If after giving some thought, you have problems doing this assignment, do not hesitate to contact me ( [sumond@uw.edu](mailto:sumond@uw.edu) ; PCAR 462).
1. (1.5 Points) Run Cluster Analysis on the Needs variables data (X1 – X10) to identify the number of distinct segments present in this market. Do you need to standardize the variables for this analysis? Why? How many clusters would you choose?
  2. (2.5 Points) Suppose you are asked to divide the market into FOUR segments based on consumer Needs. How are the segment sizes different for the hierarchical versus the k-means clusters? Report the 25<sup>th</sup> and 75<sup>th</sup> percentile values of the Needs variables (X1 – X10) for the entire sample as well as their means within the different segments. Also report the means and proportions of demographic and technology use variables (Z1 – Z7) for the different segments.
  3. (2.5 Points) Explain why the occupation of consumers may be helpful to discriminate between the different segments (e.g., if a sales person at a BestBuy store knew the occupation of a consumer in the store, s/he may be able to guess that consumer's segment type reasonably well). Besides the occupation variable, suggest two more variables which could potentially help to discriminate between the consumer segments. **Hint:** For continuous variables



and ordinal variables, constructing appropriate boxplots may help.

4. (3 Points) Interpret and profile the consumer segments (i.e., describe each consumer segment in plain English) based on the prominent features of the Needs variables (X1 – X10) and the demographic and technology use variables (Z1 – Z7). Give appropriate names for these segments.
5. (2.5 Points) Given the attributes of ConneCtor, which segment(s) would you target for ConneCtor? Compare and discuss the advantages and disadvantages for each segment