Global Voice Systems[1]

AMMAN, JORDAN

Ashraf Rawashdeh guided his car through the morning rush hour traffic and headed downhill on the narrow streets leading toward downtown Amman. As he approached the office, he glanced at his watch—8:50 a.m. He did not want to be late on his first day of work at Global Voice Systems.

He parked his car, walked to the elevator and waited while he revisited his own strategic plan. He had just completed his MBA at the University of Jordan, and he was eager to apply what he had learned in school. But he began the job hunt a little late. Between classes and family responsibilities, he had not been able to look as hard as he had wanted.

Like most Jordanians, he had looked first for a job in the Gulf (Saudi Arabia, Bahrain, United Arab Emirates, Qatar), lured by salaries that were double and even triple the going rate at home. Jobs for Jordanians in the Gulf had all but disappeared after the Gulf War, but in recent years job opportunities had again opened up for Jordanians.

Despite the attractive pay, he could not convince himself to move to the Gulf, far from family and in what he considered a much more socially conservative environment than at home. Besides, the IT sector, his area of interest, was one of the fastest growing industries in Jordan. Even His Majesty[2] had repeatedly met with domestic and international IT businesses to stimulate growth in that sector of the economy.

There were plenty of interesting companies in Jordan in which to look for work. Global Voice Systems, where he finally accepted a job as a marketing manager, had great products based on the evidence he had seen. The company sold three computer telephony products-AccuDial, a call accounting system; UltraVox, a voice and e-mail messaging system; and SpeechLog, a voice recording and archiving system. The firm had also developed custom integrated voice response (IVR) systems. (Appendix 2 provides a detailed overview of the industry).

Global Voice Systems is in the computer telephony market. Computer telephony is loosely defined as "the discipline of adding computer-based intelligence to the making and receiving of phone calls and other complex transactions."[3] A more robust definition and detailed industry overview can be found in Appendix 2.

While some computer telephony applications work with individual phone lines, most work with a private branch exchange (PBX). A PBX is an in-house telephone switching system that interconnects telephone extensions to each other, as well as to the outside telephone network. It may include functions such as least cost routing for outside calls, call forwarding, conference calling, and call accounting. Most offices have some sort of PBX system. Modern PBXs use all-digital methods for switching and can often handle digital terminals and telephones along with analog telephones.[4]

The following are some common computer telephony applications with explanations:

- Voice mail: Allows callers to leave messages for one or more people. Also can allow distribution of audio messages to multiple users. More importantly, computer telephony products often allow unified access to email, either through the computer, or through a telephone. The application can "read out" the email over the phone. This is referred to as "unified messaging."
- Call accounting: Tracks numbers dialed. Allows user to block certain outgoing numbers, as well as assign charges to certain extensions (as in a hotel).
- Call recording: Records telephone conversations. Useful in phone-based transactions (as in call centers) to provide a record of the transaction.

- Integrated Voice Response (IVR) systems: Allows the caller to access and modify information by dialing numbers on his or her telephone. Telephone banking and online course registration are examples of IVR systems. These systems are typically developed on a custom basis, like any specialized software application.

Computer telephony features can be provided in several ways. One method is through a specialized computer directly integrated into the PBX system. Another method is through a software application that runs on an ordinary PC that is attached to the PBX.

Global Voice Systems' products run on a standard Windows-based PC with a special peripheral card, purchased from a hardware manufacturer, and Global Voice's proprietary software.

Many older PBXes have no provision for computerized services, so these systems can only have computer telephony features added through a PC-based system. However the trend has been to bundle ever-larger amounts of computer telephony-based features in new PBX systems.

The lift stopped and Ashraf walked on to the sixth floor. He turned the corner and walked down the darkened hallway past some nondescript offices, smoothing his suit and prepping himself to be at his best as a new employee. Global Voice was a small company and Ashraf knew he would be the only one wearing a suit that day, but he reasoned it never hurt to make a good impression. He would be employee number eight, completing the company's current office space. Samer Halawa, the general manager, had told Ashraf during the interview that if business picked up, they would move out of this older building to a larger, more modern office space.

He walked in and scanned the office. The secretary said, "hello" and ushered him back to Samer's office where he sat down.

"We're glad you are joining us here," said Samer. They went through the usual social niceties, but it was not until after the office assistant brought in the sweet, strong cups of Arabic coffee that they got down to business.

Samer went back a few years outlining his vision of the business. He had graduated from Ohio State University in 1991 in electrical engineering and had returned to Jordan where he worked for a few years for R. Nabulsi Co., a family-owned telecom equipment reseller. After a few years, he left for another company that provided data distribution software for the Amman stock exchange. After two years there, he began to look for other opportunities.

"At the time, I didn't see a job in Jordan where I could be really well off. The opportunities and salaries here just weren't very high," he said.

Samer described how his two previous jobs had convinced him of the power of combining computer applications with the telephone. He approached his original employer, Nabulsi, to join him in forming a business to develop computer telephony applications, which they agreed to do. However, life was not as easy as he originally envisioned.

"I didn't think it would be as tough as it was. We faced a lot of difficulties at the beginning. Even now, we are always tight on cash flow," Samer said. Samer had in mind his company's recent earnings report (see Exhibit 2).

	Subtractions (JD)	Additions (JD)
Sales		129,578.370
Less: Cost of Sales		
Beginning Inventory	6,817.960	
Local Purchases	7,026.465	
Foreign Purchases	51,244.150	
	65,088.575	
Less Ending Inventory	3,372.000	
		(61,716.570)
Gross Profit (110%)		67,861.800
Plus Revenue from Maintenance		970.000
		68,831.800
Less:		
G&A Expenses	47,876.084	
Depreciation on Furniture and Equipment	2,746.000	
Deferred Communication Expense	105.000	
		(50,727.084)
Profit		18,104.716

Exhibit 2. Income Statement 1999

Ashraf shifted uneasily in his seat. He hoped the tight cash flow would not affect his first paycheck, still to come.

Samer turned his attention to the market environment, the reason Ashraf was hired. Despite the tight finances, Global Voice was in a strong position in the local market. In fact, this was one of the reasons Ashraf had been attracted to the company in the first place.

The company began by modifying existing computer telephony products produced by an American company, TAA. These products were very expensive and Global Voice Systems realized it could develop its own systems for much less money.

"When we started in 1996, there were lots of competitors," Samer said. "All of the competitors were foreign and they charged high prices" (See Exhibit 3).

Global Voice Systems was able to undercut the foreign products with its own, custom-designed products. Exhibit 4 compares Global Voice System's prices with those of foreign competitors.

Prices are for an eight-port system (up to eight callers processed simultaneously). In Jordan this is considered an intermediate-sized system.

By the end of 1997, Global Voice had driven all of its competitors out of the market through a combination of pricing and quality. "Since we were the only local product, we were better able to support our products when there were problems," Samer said.

Quality was an important issue for computer telephony products. In any new software product there are bugs, but working out these bugs was particularly important for computer telephony products. "This software must be bulletproof. We faced initial difficulty making it that way. If you had a consumer software program that crashed once a week, that's OK, but for an auto-attendant program like ours, that would be terrible. Our software must run perfectly twenty-four hours a day, seven days a week," Samer said.

As a local company, Global Voice originally faced doubts from the market about its product quality. Jordanian consumers were often willing to pay much more for a foreign product, based on the perception that foreign-made products were higher quality. However, the company had now established itself as quality-oriented organization.

Product Line	Global Voice Systems	Foreign
Accudial	325 JD	$1,200
UltraVox	2,400 JD	$7,500
Speech Log	3,000 JD	$8-$9,000

Exhibit 4. Comparative Pricing Table

For local customers, perhaps the most impressive proof of quality was Global Voice's client list. The company had installed systems in most of the major organizations in Jordan, including Royal Jordanian airlines, the University of Jordan, the Sahab Industrial Estates[5] and many governmental organizations.[6]

"At the University of Jordan, they had ten operators answering calls before our system. After installing our system, they were able to reduce that to around two people," Samer explained.

Originally, Global Voice had sold its products directly to customers. However, as the company established a brand name for itself, PBX dealers began asking for its products. As an incentive, Global Voice began offering them a commission on the sales price. "We are thinking about getting out of direct sales altogether, because the support function is very time-consuming," Samer said. He explained that installation and troubleshooting for new systems tended to distract developers from their main work – developing new products. Dealers accounted for roughly 70 % of current sales, while 30% continued to be direct sales.

While tweaking the distribution channels might be a good idea, Samer thought the biggest problems for the future lay in two areas: staying technically current, and building an export market.

Name	Active Voice	AVT Corporation	SpeechSoft	TAA
Headquarters	Seattle, WA, USA	Kirkland, WA, USA	Milford, NJ, USA	San Juan Capistrano, CA, USA
1999 Sales ($)	$62.2 million	$130.2 million	<$1million	
# of employees	319	323	N/A	
Corporate Form	Publicly Traded	Publicly Traded	Private	Private
Main Products	Unity, Repartee, Replay – Unified Messaging, Voice Messaging Lingo – Small business voice messaging Hospitality – Computer telephony for Hospitality Industry ProNexus – IVR Subsidiary	CallXpress – Unified Messaging Right Fax – Network Faxing Commerce Path – Production Faxing MediaLinq – Outsourced Document Delivery	SpeechMaster and CallMaster– voice messaging	Amanda – Unified Messaging Product

Exhibit 3. Global Voice System' Competition

Samer spoke about the cost of keeping products up-to-date. In any technology industry, keeping products current is a major challenge. "When I started the business, we could pay our engineers around 250 JD[7] a month. Now someone good with experience makes closer to 1,000 JD a month," he said. Ashraf himself knew that one reason for this was the exodus of Jordanians to higher-paying jobs in the Gulf. He also knew that many of Global Voice's competitors were U.S.-based companies that, he assumed, had more money to spend on development than 1,000 JD a month.

Samer felt that with their dominant position in the local market, Global Voice's best opportunities were in exporting to neighboring countries. Exhibit 5 provides information that can be used to assess business opportunities in countries in the region. In the past year, the company had begun selling a few systems in Saudi Arabia, the United Arab Emirates, Syria, and the Palestinian-controlled West Bank. Selling to these countries offered an opportunity to sell at higher prices, he thought. However, he was not sure of the best way to proceed, whether through a dealer, directly, or forming a joint venture. As he mentioned this, he looked at Ashraf hopefully. Ashraf's palms began to sweat a little.

Then Samer stood up and reached for his jacket. "I'm sorry, but I have to run to a meeting. Let me introduce you to Sharif," he said. "He'll help you get started today."

Ashraf had met Sharif Nabulsi, the director, briefly during his earlier interviews. As Sharif came into the office and Samer left, he laughed to himself at how small Jordan seemed sometimes. Everyone always seemed to know each other. Ashraf's cousin was married to one of Sharif's cousins.

The conversation and the coffee continued. Sharif explained his own interest in the business. He had worked for R. Nabulsi Co, which his family owned. He and Samer had joined together to start Global Voice Systems. The ownership was divided 40-30-30 between Samer, Sharif, and Sharif's brother, who served as a silent partner. Despite initial hopes and optimism, getting the business off the ground proved difficult at times.

"We expected a bigger market," Sharif said. He felt that sales in Jordan had never reached their full potential. It was also difficult to establish their brand name in the marketplace.

"At the beginning, there were doubts about our quality. But now with the references we have, we don't have that problem anymore in Jordan," explained Sharif.

Ashraf asked about future prospects for the company.

"We are a small company. I'm not sure if we can survive by making off-the-shelf products," he said. Sharif said he wondered about future trends in the PBX market. While older systems lacked integrated support for computer telephony features like voice mail, call accounting, and other features, newer systems often had all these features bundled in. The newest systems even came with built-in support for data networking and internet telephony.

Although worried about these issues, Sharif was confident of the company's strengths. He felt their ability to establish and support a relationship with the customer was most valuable. He also felt that, as one of a handful of companies doing computer telephony work in the Arab world, Global Voice could exploit its cultural knowledge to begin serving surrounding markets.

			GDP		Main Telephone Lines					
Country	Population (millions) 1998	Density/ km 1998	Total GDP (US$ billion) 1997	Per Capita GDP (US$) 1997	Total (thousands) 1998	Per 100 inhabitants 1998	Largest City per 1,000 inhabitants	Waiting List (thousands) 1997	Waiting List Years 1997	Cost of local call, $/3 minutes 1997
Algeria	30.08	13	47.9	1,624	1,477.0	4.91	55	732.0	7.9	.02
Bahrain	0.64	971	6.3	10,241	157.6	24.55	--	--	--	--
Egypt	65.98	66	75.6	1,195	3,791.5	6.02	--	1,310.0	3.9	0.01
Israel	5.98	288	98.6	16,691	2,819.0	47.11	398	22.0	0.1	0.07
Jordan	6.13	64	7.0	1,208	510.9	8.34	178	156.0	4.8	0.03
Morocco	27.69	42	33.4	1,214	1,515.1	5.47	112	29.0	0.2	0.08
Saudi Arabia	20.18	8	146.5	7,515	2,878.1	14.26	178	1,190.0	5.8	0.02
Syria	15.33	83	64.9	4,343	1463.0	9.54	132	2,950.0	>10	0.05
United Arab Emirates	2.35	31	48.0	20,179	915.2	38.9	333	.6	0.0	0.00
West Bank and Gaza	2.90	7,620	--	--	167.3	5.78	--	202.0	>10	0.05

Exhibit 5. Information on Selected Middle East and North African Countries

Sources: World Bank and International Telecommunications Union

The future, he thought, lay with what he described as "value-added" products. That is, customized IVR systems that allowed companies to communicate with their customers through the telephone, establish call centers, and link to mobile networks using wireless applications protocol (WAP).[8]

He described a fax-back system Global Voice developed for the Greater Amman Municipality that allowed residents to receive instructions on their applications for permits automatically via fax. The problem, Sharif said, was the low prices the local market was willing to pay for such systems. In Jordan, an IVR system might sell for as little as a few thousand JD, which did not do much to increase the company's cash flow. Ashraf was a bit surprised at the low prices, given that he had heard that such systems often cost tens of thousands of dollars in developed countries.

Sharif began to talk about the company's marketing plans. Ashraf's ears perked up a bit; after all, that was why he was here. "Samer and I disgree a little bit on this," he said. Sharif felt that the company should focus most of its effort on development in an effort to stay ahead of its competitors. Samer thought they should enter regional markets in the same way they began in Jordan, first through direct sales to establish their brand, then shifting to dealer channels.

Ashraf wondered how the company would be able to afford the expense of a regional office, given that money was not growing on trees, even here in the Holy Land. Still, he always thought that marketing drove the organization.

Sharif paused for a minute to pull out a table with some competitive pricing information he had compiled and handed it to Ashraf. Ashraf filed it away to look at later. Ashraf remembered from his marketing class that pricing policy could often be an important factor in selling software products. He asked Sharif about the company's pricing philosophy.

"We were selling most of our products on a fixed-price basis, but lately we've begun looking at charging by the hour," Sharif said. He explained that for the standalone products in particular, the biggest determinant of development time was whether Global Voice had previously worked on the model PBX installed at the customer's premises. Once the developers had compiled a basic library of functions performed by a specific model of PBX, the same software program could be adopted to serve the needs of other clients that use the same model PBX.

Sharif took Ashraf to meet Belal Othman, the company's sales manager, with whom he was to share an office. As he left him, he reminded him of the company's decision-making philosophy. "We tend to be conservative in our decisions. We don't want to invest a lot of effort in something if there is no market for it," Sharif said.

Belal smiled, stood up and shook Ashraf's hand as he came in. Ashraf found himself looking up. Belal was tall, very tall.

"Ahlan wa sahlan," he said.

Ashraf responded warmly to Belal's greeting, even though he wondered how Belal felt about having to share his office. As Ashraf sized up his new desk, he began chatting with Belal about life in the company. Belal was currently Global Voice's only salesperson. After a previous job as the sales agent for the Jordan Yellow Pages, he had come to Global Voice Systems about three years ago.

"I like this job," he said. "There's much less supervision than I had on my other job. I have my goals and my targets, and they let me do my job the best way I can."

"Job satisfaction is composed of several things including your managers, the other employees, your salary, and the work environment. On all accounts, I am happy," he explained.

Belal described his approach to selling the product. First, he identified industrial sectors where businesses were likely to have PBX systems. Hospitals, government offices, and hotels were the big ones. As he said this, he shuffled through the papers on his desk to pull out lists of hotels and other businesses he had obtained from local trade associations.

Belal then sent targeted customers a fax explaining the features of his products, waited a few days, and then called to try to arrange an appointment with the general manager.[9] Because of the lack of competition, Belal explained that often the biggest obstacle to getting a sale was simply getting the time to see the manager.

"Once they sit with us to see the system and they see the benefits, the manager often makes a decision right away to go ahead," he said.

Belal also identified name recognition as a problem for the company. Global Voice had run several advertisements in Al-Rai[10] while getting started, but once it had established itself as the leading company in the market, mass advertising stopped.

Global Voice also faced a problem of a maturing market. The company had already sold its products to many of the country's largest companies, and now was trying to target smaller companies.

The company was well known among PBX dealers, Belal thought, but less known among the ultimate consumers of its products. Belal wondered if some additional advertising might raise its brand awareness. In particular, AccuDial, the call accounting product, was very popular among small hotels and

furnished apartments in Amman, but Belal was not sure if the use and benefits of the product were well-known everywhere in Amman, and especially outside Amman.[11]

Global Voice had recently received funding from an American development agency to assist it in developing professional packaging for its products, which until now had been delivered straight from development. Belal thought a next step might be to run some advertisements in trade magazines or create additional brochures and marketing materials.

Belal mused about what information it would take to enter a neighboring country. "I would want to know who the good PBX dealers are there," he said, "including their size, the number of employees, types of products, and, most importantly, their reputation."

In Jordan, certain industries tended to use specific brands of products, he said. Hospitals often used Ericsson PBXes. Hotels often used Northern Telecom PBXes.

Ashraf stepped away from his desk and went down to the street to clear his head and think. What should be his first move? He knew that Global Voice needed a marketing plan, but what should be in the plan? Should they enter export markets, or did it make more sense to focus on growing the local market?

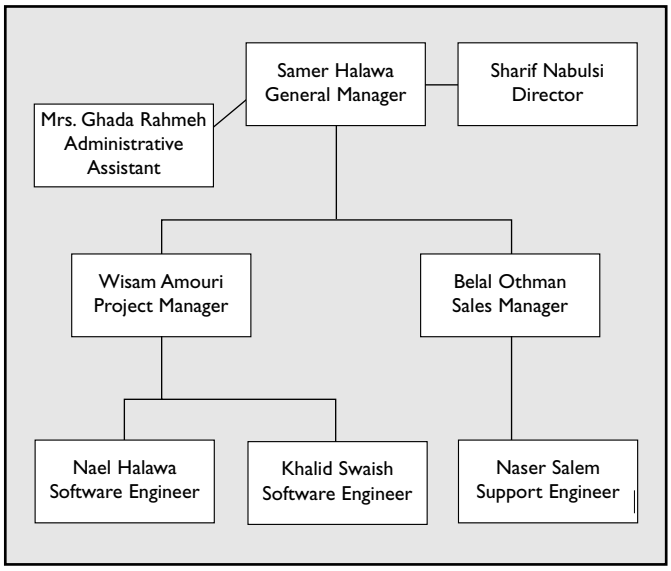


Exhibit 6. Organization Chart

If they exported, in which country should they start? Egypt was relatively nearby, and big, but a smaller, wealthier country like the Emirates might be an easier mark.

As he returned to his desk, he looked in another office he had not noticed before. There a young man about his age was rolling up a prayer rug. Ashraf had not even heard the muezzin's call to prayer because he had been so distracted learning about the business. The man looked up.

"Hello, I'm Wissam," he said. Wissam was the technical manager for the company. He supervised a staff of two developers. In his head, Ashraf drew an organizational chart (See Exhibit 6). He had now met all of the company's employees.

Wissam settled into his chair. Global Voice was Wissam's first job out of college, and he had advanced within the company. Wissam said that the job had been a technical challenge at first, but now it was becoming more of a managerial challenge. Now that the initial push to develop the company's product line had abated, technical changes were limited to incremental modifications to existing products. Wissam was somewhat worried that by sticking to the current technical platform, the company might not be developing the internal skills it would need to take advantage of the latest technology.[12]

"The company's future is outside Jordan," Wissam said. "In Jordan, people often don't understand the value of our products.". While the company was trying to export, Wissam said that he felt the company did not have the financial resources to aggressively market its products outside of the country.

Ashraf pondered these issues as he returned to his desk. There he saw a note waiting for him. He picked up the sheet of paper, which had a photocopy of a business card. It was from Samer.

"A colleague gave me this card. It belongs to an American venture capitalist who is thinking of investing here. What do you think we could do to present ourselves to her?" he had written.

Ashraf knew he had a lot to do, and it was already 2 p.m. He knew Samer would be eager to hear his preliminary suggestions in the next few days.

ASSIGNMENT QUESTIONS:

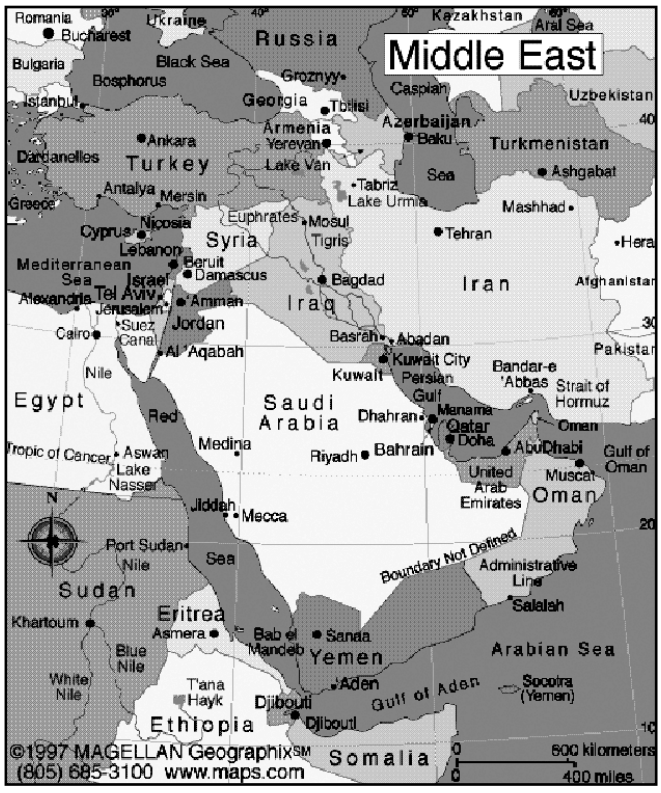
1. What should Ashraf do? What sort of a marketing plan does the organization need?
2. What is the best way for the company to enter export markets?
3. Given the company's financial condition, what strategies are feasible and not feasible?
4. Given the constant drop in prices for technology products, is Sharif right? Should the company move away from standalone products?
5. How might the company be able to take advantage of American capital?
6. What additional information could Ashraf use? How should he obtain it?

Appendix 1

BACKGROUND ON JORDAN

World Factbook published by the US Government:
http://www.odci.gov/cia/publications/factbook/jo.html

World Bank Fact Sheet on Jordan
http://www.worldbank.org/data/countrydata/aag/jor_aag.pdf



Appendix 2

BACKGROUND ON COMPUTER TELEPHONY

World Bank summary data on power and communications
http://www.worldbank.org/data/wdi/pdfs/tab5_10.pdf

International Telecommunications Union Summary Data
http://www.itu.int/ti/industryoverview/index.htm

The following article came from this source:
http://planner.ctexpo.com/ctexpospring2001/planner/whatisct.cfm

"For the record, this is Computer Telephony"

by Ed Margulies,

Group Show Director, Miller Freeman Voice Data Group

Introduction

Wow, where to start... I've been in this wonderful industry going on 20 years and still have a tough time putting it into a few sentences. Of course, anyone who knows me says I can't put anything into a few sentences. But indulge me. Here lies the official, certified, unabridged definition of Computer Telephony.

I reckon I've got as much a right to define and re-define Computer Telephony as anyone else. I helped pioneer this industry and was selling voice mail systems back when they weighed 386 pounds. Back when we called it Voice Processing. Back when my glossary on voice processing was joyfully commandeered for what became Newton's Telecom Dictionary — along with zillions of other definitions from as many vendors.

Along the way, the very face of telecommunications has changed. Now, you can make phone calls over the Internet. Call Center agents can be linked to the Web. You can manipulate voice messages, faxes and e-mail all in the same inbox. Jeez, a decade ago, the Internet was for geeks only and your company probably didn't even have a URL. So we've come a long way. Now, on to some definitions.

The Classic Definition of Computer Telephony:

"Computer Telephony is the discipline of adding computer-based intelligence to the making and receiving of phone calls."

A new twist on the classic definition:

"Computer Telephony is the discipline of adding computer-based intelligence to the making and receiving of phone calls and other complex transactions."

At issue here is the very definition of the call itself. Traditionally, we look at "calls" as phone calls - incoming or outgoing. Now, if you look at adding computer-based intelligence to the making and receiving of these calls, you think of speech recognition, automated attendants and voice prompting for voice messages. And you're right. But take a moment to consider how the same intelligence - the same discipline - is being applied to the routing of e-mails, video, faxes, etc. In fact, it doesn't really matter whether the "call" is real-time or non-real-time. All that matters is some communication is taking place that without computer-based intelligence would be little more than two tin cans and a string.

What is Computer Telephony a part of?

Our industry is part of the overall $800 billion telecommunications market. We're the cross-over between circuit-switched hardware and software and packet-switched hardware and software. Call it $10 billion this year. Our products and services make these two worlds work together.

I figure $400 billion represents the North American part of the overall telecommunications market. This is based on reports I've poured over from BT, MMTA, Tern Systems and others. About 75% of this is services (long distance, Internet, wireless, private networks, etc.). This leaves about $100 billion for hardware and software, of which just under $10 billion is comprised of computer telephony hardware and software in 1997.

Over the past five years, omputer telephony has been growing at a cumulative average growth rate (CAGR) of about 27%. According to a recent Piper Jaffray report (Minneapolis, MN—612-342-5545), increasing from roughly $8 billion in 1996. Edward Jackson, CFA, Senior Research Analyst at Piper Jaffray, authored the piece. He segments the market the same way I've been looking at it, so I was instantly gratified when I read it.

CPE-Based Messaging Segment

CPE (Customer Premises Equipment) -Based Messaging is voice mail and other store and forward technology located on the customer premises. This includes all types of voice messaging and fax messaging. Even so-called Unified Messaging fits in here. Companies such as Lucent's Octel Messaging Division, AVT Corp, Active Voice, Callware, Lucent/Octel and VSR are some of the top players. Based on 1996 revenue of $2.5 billion and a CAGR of between 15-25%, this segment could pull down as much as $6 billion by year end of 2001.

The barriers to entry here are PBX integration and rock-solid packaging for dealers. Unless you can backwards-engineer 196 PBX interfaces or do a great deal with black boxes, you're in for a rude awakening here. No matter how slick your product is. It took the incumbent players over a decade to figure out how to hook-up to all the switches out there. Ditto the same amount of time to produce highly stable products.

Messaging includes not only voice mail, but fax and electronic mail, fax blasters, fax servers and fax routers, paging and unified messaging (also called integrated messaging) and video messaging. Internet and Intranet Edge servers of all varieties streaming one-way "messaging"—from video to over-the-phone read text mail. Ditto mixed-media web-based messaging.

Interactive Voice Response

Interactive Voice Response (IVR) is chugging along at a 10-15% CAGR. Based on 1996 revenue estimates of $600 million, we'll reach $1.4 billion in two years. Here's where you'll find Bank-By-Phone, Pay-Per-View and myriad order entry applications. I also lump in Audiotex and any other "direct customer access to enterprise data" stuff here. The whole idea is to allow users to self-navigate for information. If you can "give data a voice," you can let your corporate information stores do their own talking. This takes in fax-on-demand, too.

On the surface, IVR may look like a pretty low-growth market compared to the rest of computer telephony. But there's a hidden prize: It's synergy with e-commerce.

Many of the classic IVR players, like InterVoice, Brite and Edify, for example have re-invented themselves as not only IVR players, but e-commerce experts. The idea: IVR is a "front end" to corporate data stores. We use the phone as the "keyboard"—an extension of what used to be an IBM 3278 terminal hanging off a mainframe. Your web site is really just another "front end." So the really smart IVR vendors are applying their expertise in back-end data manipulation and

transaction processing to the web and e-commerce. Brilliant. The Internet and e-commerce is clearly our future. By not applying these proven IVR disciplines to the web is to write your own ticket for extinction.

Call Center Segment

I've said many times that a call center is a "state of mind." Traditionally, we consider a large telephone switch or Automatic Call Distributor (ACD) as the basis for a call center. The idea is to process as many incoming (and in some cases outgoing) calls as possible during the shortest period of time. If you've heard: "All of our agents are busy at the moment. If you'll stay on the line, the next available representative will serve you."—you've experienced the customer end of a call center. There are many software solutions in this sector. Take workforce management, help desk, skills-based routing, remote agent technology and quality monitoring solutions for example.

The Call Center segment also takes in both inbound and outbound call handling, "predictive" and "preview" dialing, automated attendants, LAN / screen-based call routing, desktop routing, one number calling / "follow me" numbers, video, audio and text-based conferencing, and collaborative computing.

The glue that provides computer telephony intelligence in the call center is called Computer-Telephone Integration (CTI). Take Dialogic's Computer Telephony Connect, TSAPI, 3rd-Party TAPI implementations and a host of call center solutions from folks like Genesys, IBM, Lucent, Oracle, Quintus, and Siebel, to name a few. These are the folks specializing in so-called "formal" call center magic. That is, making traditional switches do tricks with computer telephony stuff.

CTI is a valid sub-set of computer telephony. But it is not the whole. It is but one sub-segment listed here. It's nestled-in to the call center part of computer telephony. Computer-Telephone Integration is the discipline of making PBXs and ACDs work in concert with your network, databases and workstations. For the most part, CTI is found in call centers. It's the "glue" that allows calls to be routed coincident with the grabbing of customer information for awaiting agents. Screen Pops are part of CTI. Skills-based routing in the call center is part of CTI. TSAPI and Third-Party call control software is part of CTI.

Clearly, CTI passes the computer telephony acid test of "adding computer intelligence to the making and receiving of phone calls." But so do Interactive Voice Response, Fax-On-Demand and Voice Mail. Yet IVR, FOD and Messaging are not CTI. They are sovereign CT disciplines, just as CTI is a sovereign computer telephony discipline.

What's really exciting is the "Informal" and SOHO sub-segments. Informal call centers, done on an ad-hoc or departmental basis, are heating up. In fact, the Market Perspectives pen-based surveys we did at Computer Telephony Expo Fall 98 last September pegged the growth of call center seats at 94% this year. Most can be attributed to this informal sector.

More thrilling is the idea that the SOHO sector will comprise some 25% of this market (according to Dataquest) within several years. This means big opportunity for folks developing solutions in the 5 to 25 seat range. The driver: Quicker, cheaper technology and a growing VAR base to support it. Communications Controllers (UnPBXs and UnACDs) will play a big role here.

Enhanced Services Segment/NexxNets

The Enhanced Services Segment has huge potential. This is the realm of what I call "NexxNets" or Next Generation Telcos and Service Providers. Consider the fact that the $400 billion North American telecommunications market is comprised mostly (75%) of services. Long Distance, Internet, Local Phone Service, Wireless and privately managed networks.

With worldwide telecom deregulation in full force and ISPs morphing into CLECs (Competitive Local Exchange Carriers), the need for differentiation is key. Clearly, touting cheap, cheaper, cheapest will run out of gas in short order. Talking Dogs and giveaways notwithstanding. These service providers need to make their networks productive and easy to use for subscribers. Enter Web-based unified messaging, follow-me services, fax forwarding and a host of other computer telephony-inspired goodies.

It's estimated that $1.2 billion was spent on enhanced services hardware and software in 1996. With a CAGR of between 25 and 30%, we could see as much as $4.1 billion in 2001. All made up of mission critical stuff. Mirrored, redundant disks, power supplies and "power sequenced outgoing" calls as possible during the shortest period of time. If you've heard: "All of our agents are busy at the moment. If you'll stay on the line, the next available representative will serve you."—you've experienced the customer end of a call center. There are many software solutions in this sector. Take workforce management, help desk, skills-based routing, remote agent technology and quality monitoring solutions, for example.

The call center segment also takes in both inbound and outbound calls. [They include] MicroSystems and VCS to name a very few. The industry snapped-up between $700 to $750 million worth of this open and proprietary core stuff in 1997. Figure a CAGR of about 30%. The value of systems using this technology start at an order of magnitude higher than the cost of the boards and algorithms.

You've got to add a PC or other platform. Throw in other (non-computer telephony) add-in boards, software, integration costs, etc. I've seen systems with several four-port voice cards demand as high as $50,000 or more. Of course, the purchase price depends largely on how big a problem the system solves.

One easy (albeit rough) way to size the overall computer telephony market is to take this segment and multiply it by ten. Figure the core technology folks will do $1 billion by year end. That makes for a $10 billion computer telephony market. I think it is pretty close.

Even bigger if the core technology folks get their arms around the user and educate them. They need to create a pull-through vacuum for their VARs and resellers to really get computer telephony into the mainstream.

IP Telephony Segment

The IP telephony segment gets lots of ink and hoopla. Some call it Internet Telephony and some call it VOIP (Voice Over IP). Whatever. If we're lucky, it did $20 million back in 1996. But it's projected to grow at a CAGR in excess of 100% for the next several years according to a new report from the same analyst at Piper Jaffray. They project IP Telephony solutions to pull in $6.1 billion in 2003 with IP Telephony services bringing in another $8.6 billion in 2003.

Now, Lucent buys Ascend. Last year, Cisco bought Summa Four and Selsius. Nortel ate Bay. Clearly, the top telecom manufacturers and Cisco are squaring-off to fight it out in the IP Telephony space. It is not hype. Recently Ericsson and Siemens did big re-orgs to accommodate this sector.

Look at IP telephony as the golden banana telecom makers are dangling in front of telephone companies and carriers. The carriers want to reduce costs, increase network usage and launch new services. It's all about customer attraction and retention. IP telephony promises all this. It's not the value of the actual IP telephony software and hardware that's got the makers all whipped-up. It's the idea of selling into the burgeoning services sector. And snuggling up to the carriers. The incumbent switch vendors have lots to lose. They'll be spending big bucks to shore-up their position here. Bank on it. Look for OEM and private label opportunities. But you'll have to stomach and bankroll the gestation period of telco decision-making (18 months).

Wild Card Segment

Which "segment" is a wild card? The communications controller. The all-in-one wonder box that takes in CPE switching, unified messaging, IVR, web links and IP telephony. It's poised to replace the traditional switch and ACD. Due to the lack of a better term, I called them UnPBXs — used in the title of one of my books. A stupid term I take full credit for. Come up with a better one and I'll use it.

Traditional circuit switch gear makes up over $30 billion in the hardware/software part of the North American telecommunications market. This takes in Key Systems, Hybrid Switches, PBXs, ACDs, predictive dialers and small, multi-line phone systems.

Now imagine a new breed of communications controller that does all the basic telephone switching stuff along with IVR, Messaging, IP Telephony, Fax, etc. Imagine no longer. It's here. Take products from AltiGen, Artisoft, CentrePoint, Interactive Intelligence, NBX, NetPhone, Picazo, Rockwell and about twenty others. They don't all do "everything," but some do. Since these new communications controllers borrow disciplines from so many computer telephoney segments and also do the basic switching—they represent a cross-over market.

We used to say: "If it does everything, it does nothing." The idea was to focus precious resources on core competencies. We were wrong in the case of the UnPBX. Clearly, these beauties are on the way to doing just about everything. The makers of the best systems have the massive challenge of developing core competencies in many areas. Not easy. That's what makes them so awesome. Or not-so-impressive if they've got weak spots.

100% PURE Computer Telephony

So what isn't computer telephony? More and more, mainstream hardware and software providers are staking a claim in computer telephoney. In fact, over the past year, big companies like Siemens, Ericsson and Nortel have gone through massive re-organizations to accommodate the fledgling IP telephony segment. IP telephony certainly passes the acid test of "adding computer-based intelligence to the making and receiving of phone calls."

Our little secret: Computer telephony takes on whole new meanings in each region. In Malaysia, wireless telephony is computer telephoney. Grab a cell phone with Caller ID, voice mail and fax forwarding and you've got a mobile office. In Germany, call centers are computer telephony and so are Basic Rate ISDN gadgets. In Japan, communications controllers are hot and computer-based fax has been hot for a decade. So depending on the local constituency, computer telephony's meaning changes.

Why is computer telephony so hot?

There are a five chief factors fueling the growth of CT:

1. **Our Insatiable Thirst for Instant Information**
   Let's face it. ATM Cash Machines, Television, and now the World Wide Web have turned us into "Instant Info /

Instant Service Freaks." Our expectations of how quickly we can get service, grab information and do transactions is heightened from where it was just ten years ago.

Computer telephony helps to make transactions happen quicker. And often without operator or agent intervention. That's the idea: To route "calls" intelligently. To add value to transactions. To make the processing of transactions easier and quicker.

2. The Idea of using Communications Customer-Centric Competitive Weapon

The customer is king. If he calls, sends an e-mail or faxes you—you must respond quickly. If she calls and you are busy and can't guide her to the correct info—she hangs up (or logs off) in frustration. Who does she then call? Your competitor. Simple. Given the choice, customers migrate to the path of least resistance. Or the path of least pain. Or the fun path.

Good web sites have set a high expectation bar on what visitors and clients want to see in experiencing your company. Customers are increasingly intelligent, technically savvy and fickle. Computer Telephony, done well, pleases them. Done crappy—it gets customers angry.

3. Economies of automating calls and doing self-navigation

Self-Navigating customers means less manpower for your company. Simple. A CT-equipped solution can handle literally thousand of transactions per hour. How many people would you have to employ to do all of those "live" each hour? Of course, you still need to have "live" phone agents answering questions and holding hands with some customers. You still need "live" online help or at least messaging on your Web site. But you can save thousands—no, millions with computer telephony. Sit down with your CFO and do the math.

4. The Internet and Deregulation of Telecoms Worldwide

Deregulation means competition. Competition means lower prices and more features. Computer telephony enables the features and helps lower costs, which in turn makes the services cheaper. Simple. Now that it's legal in most countries to compete with the government in providing phone service, entrepreneurs and new phone companies are snapping-up computer telephony by the bushel basket.

5. The dawn of "Open Telecommunications"

Computer telephony's growth is due in part to the extraordinary explosion of "core" technologies and adoption of both de facto and dejure technical standards. Bottom line: Telecommunications solutions are beginning to lose their proprietary underpinnings. Off-the-shelf components and APIs are allowing more value-added opportunities. What's happening now in telecommunications is what started to happen 15 years ago in computers: More standards. More choices. More value-added.

Computer telephony's core technologies include voice recognition, text-to-speech, digital signal processing, applications generators (of all varieties—GUI to forms-based to script-based), USB (Universal Serial Bus), video and audio compression, call progress, dial pulse recognition, Caller ID and ANI, digital network interfaces (T-1, E-1, ISDN BRI and PRI, SS7, Frame Relay and ATM), voice modems, client-server telephony, higher and cheaper desktop LAN/WAN connectivity, cheaper managed IP network components, fiber, logical modem interfaces, multi-PC telephony synchronization and coordination software, and multimedia edge servers. Some of the significant standards include the ITU T.120 (document conferencing) and H.323 (video conferencing), Microsoft's TAPI (Telephony Application Programming Interface), TSAPI (Telephony Services API)— a phone switch control NLM under NetWare and now also NT, Sun's Java Telephony API, the ECTF's (Enterprise Computer Telephony Forum) S.100 and H.100 specifications and Dialogic's CT Media S.100 implementation.

About the Author of Appendix 2 — Edwin Margulies

Edwin Margulies is an inventor, author and long-time advocate of open architecture. He is a veteran of the computer telephony industry going on twenty years. He is Group Show Director - Voice/Data Group at Miller Freeman, Inc. Margulies is responsible for the promotion, marketing and general expansion of the group's trade shows and conference programs. This includes Computer Telephony Expos, Call Center Summit and NexxNets. He is also a columnist for Computer Telephony Magazine in which his "CT Periscope" column appears each month.

Margulies is the author of nine best-selling computer telephony books: Understanding Java Telephony; Secrets of Windows Telephony; Understanding The Voice-Enabled Internet; 1001 Computer Telephony Tips, Secrets and Shortcuts; SCSA: Signal Computing System Architecture; Client Server Computer Telephony and 337 Killer Voice Processing Applications, Audio Teleconferencing - The Complete Handbook and The UnPBX; The Complete Guide to the New Breed of Communications Servers.

Margulies has been involved in hundreds of both large and small scale systems integration designs for telephone company deployment and CPE. These include Automated Intercept, HOBIC replacement, Host Interactive Voice Response, and Cable Pay-Per-View systems. These experiences prompted his invention of an ANI Converter system, patented in 1991.

Margulies was formerly VP, sales & marketing for Telephone Response Technologies, Inc. and director, sales and marketing for Enhanced Platforms at Dialogic Corporation. He has held posts as director of marketing for Unisys' Communications Industry Systems Division, and as the manager of national account development for Voicetek Corporation (now Aspect Telecommunications). He has worked on both sides of the CPE fence in the interconnect industry, and as communications consultant for CONTEL (now GTE) in the early eighties. He and two partners ran a multi-city voice messaging service bureau using computer telephony technology in the mid eighties, which led to his current fascination with computer telephony and open telecommunications.

1. This case was written by Vijay D'Souza of University of California, Berkeley under the supervision of Professor Richard Linowes. It is intended as a basis for class discussion rather than to illustrate either effective or ineffective handling of an administrative situation.

2. His Royal Highness King Abdullah II, ruler of Jordan

3. http://planner.ctexpo.com/ctexpospring2001/planner/whatisct.cfm

4. http://www.techweb.com/encyclopedia/defineterm?term=PBX&exact=1

5. The oldest and largest industrial complex in Jordan.

6. In Jordan, the largest organizations tended to be government affiliated or owned.

7. As of early 2001, 1 Jordanian Dinar (JD) = US$ 1.40

8. A standard from Motorola, Ericsson and Nokia for providing cellular phones, pagers and other such handheld devices with secure access to e-mail and text-based Web pages. (www.techweb.com/encyclopedia)

9. In most Jordanian businesses, decisions of any magnitude were only made by the general manager.

10. The leading Arabic-language daily newspaper in Jordan.

11. Jordan contains an unusually high number of short-term residence facilities like hotels and furnished apartments that catered to businesspeople, Jordanians working in the Gulf, and Gulf residents escaping the heat for the cooler summers in Amman.

12. The company's current products were developed primarily in Visual Basic.