

Crying Wolfe: Identifying and Competing in Export Markets in Developing Countries

You've been an employee of Wolfe Systems since 1997, and a trusted employee for most of that time. The nexus of telecommunications and computer assembly is a notoriously competitive niche of the technology market, but Wolfe Systems has been one of the winners. You've traveled throughout the South, from Cullowhee to Tuscaloosa to Red Bank, designing and installing the translators assembled in Wolfe's plant in the Research Triangle Park (RTP). Travel has slowed recently, however, and you've been pulled aside by the boss to undertake a special project.

The beginnings.

Thomas Wolfe founded Wolfe Systems in 1995. Wolfe was an English major at the University of North Carolina at Chapel Hill, but found his job prospects limited by his choice of major. He went on to obtain a Masters degree in electrical engineering at North Carolina State University in 1993, and returned after graduation to his home of Altamont as an electrical engineer on the Pentland County payroll. His first few weeks on the job were devoted to synchronizing the traffic lights along Hatton Avenue, the main thoroughfare in town. At this time, though, the North Carolina government announced its commitment to the creation of a broadband backbone – the state's own Information Highway. It would run from Manteo to Murphy and would have branches connecting all the major population centers. The responsibility of linking the populations in North Carolina to this backbone was left to the private sector or to local authorities.

Pentland County needed an Internet Service Provider (ISP). While ISPs using existing telephone lines were quickly established in major urban centers, the telephone switching equipment in Altamont was incompatible with the routers and switchers of these ISPs. Those served by this switching equipment were effectively cut off from the Information Highway. The potential profits from updating the switching equipment did not justify the expense for the telephone companies.

Wolfe took on the task of creating an interface between the existing switching equipment and the technology of the ISPs. While he followed many false leads, he was in the end able to construct a translator that allowed the two technologies to communicate. The translator, affectionately known as the "little black box", was a computing device. Its sole task was to translate the signals of the broadband and the signals from the local telephone equipment into a common form that both would recognize. Wolfe assembled the translator from off-the-shelf computer components, and then wrote software code to define the necessary translations for the telephone switching equipment used in Altamont. On 6 June 1994 Thomas Wolfe connected his little black box to both the local telephone equipment and to the broadband, and the citizens of Pentland County gained access to the Information Highway.

This case was prepared by Patrick Conway and Robert Connolly for use at the CIBER workshop on successful export strategy on 19 April 2001 at the Kenan Institute. The details of the case were created for classroom use and do not describe any individual business firm.

It soon became clear that Altamont was typical of many small towns in the southern United States. Once other North Carolina county governments heard of Wolfe's achievement, they also wanted his services. He saw an opportunity to do well by doing good, and opened Wolfe Systems in the Research Triangle Park in 1995. He chose the location to be close to his two universities – and to the manufacturers of the routing equipment that had made his little black box so popular. He also benefited from access to the skilled labor force in the area.

Wolfe Systems today.

Wolfe Systems is a growing corporation with an assembly facility and 500 employees based in the Research Triangle Park. Its signature product is the digital translator that allows outdated telephone switching machines to accept information signals from state-of-the-art telecommunications equipment. This device, still known in as the little black box, represents 90 percent of the revenues of the company. (Thomas Wolfe decided that his customers would prefer a more dignified name for his product, and now calls the little black box and associated services the Wolfe System.)

The Wolfe System is a product with three parts.

- First, the little black box must be designed and produced specifically for the telephone system to be translated. While the components used in production are off-the-shelf, the specifics of production must be customized to the use. (This is a reflection of the wide range of technologies used in telephone switching prior to the Internet revolution.)
- Second, the software necessary to provide the translation between broadband and local switching technology must be written.
- Third, the little black box must be installed for the client and must be shown to work. There is also follow-up maintenance that the firm provides without additional charge.

Wolfe Systems remains a privately held company, but no longer belongs to Thomas alone. To finance his expansion, he sold 70 percent of the equity to friends and neighbors in Altamont during the 1990s.

Wolfe Systems has relied upon word-of-mouth reports of successes to generate new business. This has been a successful business strategy to date, as Table 1 illustrates. The first few translators were installed for the price of \$100,000, but Thomas rapidly discovered that (1) this was not very profitable and (2) that the customers were willing to pay more. While the cost of the System is specific to the demands of the customer, the average price of the system in 2000 was just over \$130,000.

Table 1: Financial Results for Wolfe Systems

	1995	1996	1997	1998	1999	2000	2001 *
Revenues (in \$ millions)	0.200	1.500	2.500	8.300	18.450	31.240	23.430
Profits (in \$ millions)	-0.150	0.320	0.520	0.512	1.210	4.100	-0.600
Employees	6	14	22	75	170	240	230
Translators installed	2	12	20	70	150	240	180
Citizens served (millions)	0.400	2.500	4.600	14.200	32.100	53.200	38.000
* <i>projection</i>							

The purchasers of the Wolfe System were originally state and local governments, but in recent years the ISPs have also become committed customers. The ISPs have discovered that the Wolfe System is a profitable adjunct to their own services if the potential subscriber base is sufficiently large. Figure 1 illustrates the break-even point derived by one of Wolfe System's corporate customers. For that customer, the potential for reaching a new subscriber base of just over 80,000 homes was sufficient to justify the purchase of the Wolfe System. For localities with smaller numbers of homes per translator, the local governments predominate as purchasers.

The current situation.

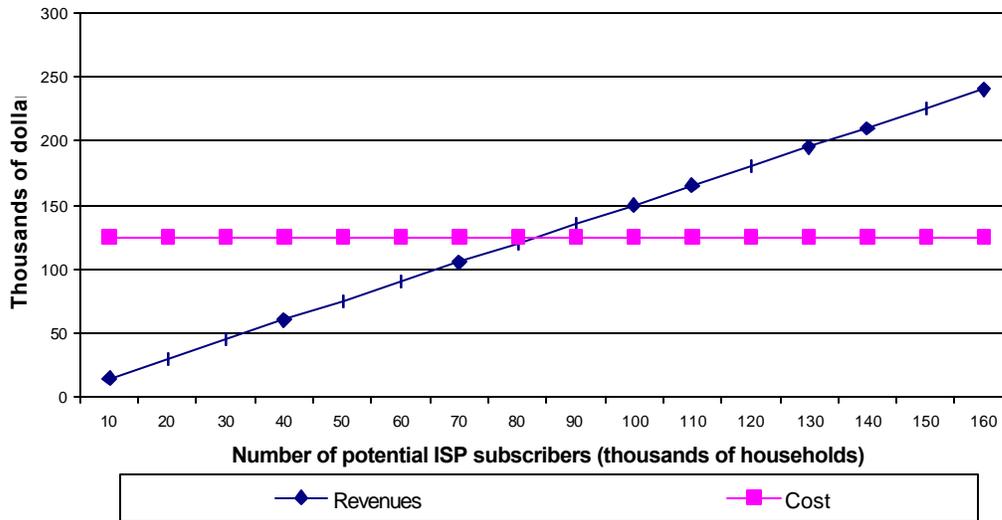
While Wolfe Systems continues to expand, its projections for 2001 are less rosy than the results observed in 2000. These projections are summarized in the last column of Table 1. There are two major reasons for the less rosy scenario. First, demand for their services has fallen off. The number of localities in the US with outmoded telephone technology and without a Wolfe System translator is shrinking. State and local governments, reliable customers until now, are facing budget shortfalls this year and are postponing or canceling this type of infrastructure project. Second, Thomas finds it hard to fire workers. He plans to reduce the number of employees in 2001 through attrition, but this will not bring the payroll down to a level consistent with the amount of work available. The combination of these two factors has led to a projected loss for 2001 – the first time this has happened in the life of the company.

Other markets.

Thomas is not ready to return to Altamont, but to stay in business he must find new markets for his product. It has often struck him in the past that there must be many regions in developing countries served by the same sorts of outmoded telephone equipment that has made the Wolfe System successful in the US. Up until this year, he and his staff have been fully occupied in meeting US demand. However, the recent downturn led him to contract with a local survey research organization (SRO) to ascertain the size of potential markets in developing countries

Figure 1

Wolfe System: Break-even point for ISP firms



The SRO created a three-page questionnaire that it sent off to telephone companies, to telecommunications offices of national governments, and to the offices of local governments throughout Central and Latin America. (It paid a graduate student at UNC-Chapel Hill to translate the questionnaire into Spanish.) The respondents were promised anonymity in reporting results. Fifteen hundred questionnaires were mailed. One hundred fifty-two responses were received. The critical results of that survey are presented in Table 2.

The responses to question 1 suggest that Thomas' intuition was right on target. A majority of localities responding had the problems of incompatibility in telecommunications equipment that has made Wolfe Systems so successful. It is also clear from the responses to questions 2 and 3 that some local competitors exist for this service, but that these competitors are either unable to provide the service profitably or are offering the service at a price considered relatively high. Questions 4 and 5 highlight difficulties that Wolfe Systems will have in serving that market.

Table 2: Results of Questionnaire on Foreign Demand

Question	SA	A	D	SD	
1. There are localities in our region that use telephone technology incompatible with common broadband switching and routing equipment.	72	46	19	15	
2. (If the answer to question 1 was SA or A): Local telecommunications companies have identified a cost-effective way to solve the problem of technology incompatibility.	3	23	65	27	
3. Internet service providers (ISPs) have neglected large geographic parts of our region because the cost of providing service is not matched by potential revenue.	106	8	22	16	
4. \$130,000 is a reasonable price to pay for the ability to provide broadband connections to our local areas.	10	32	58	52	
5. We prefer to contract with local providers of telecommunications services.	42	69	30	11	
6. The number of households in your region is:					
0 – 40,000					65
40,000-80,000					51
80,000-120,000					33
120,000 and more					3
Source: Survey Research Organization					
SA: strongly agree. A: agree. D: disagree. SD: strongly disagree					

The responses to question 4 indicate that the average price Wolfe Systems charges its US customers is considered relatively high for these potential markets. The responses to question 5 document the home bias associated with competition overseas. In question 6, the survey asked for the number of households in the region. These potential customers are in a majority of cases found in concentrations of less than 80,000 households.

The Export Strategy.

The survey has confirmed Thomas Wolfe’s intuition that Wolfe Systems could serve developing-country markets with its product. He recognizes that further planning is necessary, however, in developing an export strategy.

In his view, there are three important questions to be addressed in designing that strategy:

1. How does Wolfe Systems become competitive with foreign producers in developing-country markets?
2. How does Wolfe Systems identify specific foreign purchasers for its product?
3. How does Wolfe Systems anticipate and solve the difficulties that will arise in designing, exporting and installing the product?

Thomas has identified you from among his employees as, in his words, “not only the best and the brightest, but also the most dispensable from the production activity of the firm”. He has asked you to come up with a list of suggestions to answer each of these questions. Each suggestion should be buttressed by an explanation of your reasoning. You’ll be asked to present your results at the next meeting of the department heads.