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Wireless Technologies at Agriculture ITP

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WIRELESS TECHNOLOGIES AT AGRICULTURE ITO

Teaching Cases

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Introduction[1]

On December 15, 2002, Myles Gustofson, IT Manager at Agriculture ITO, an industry training organization in New Zealand, evaluated the results of a five-month pilot of Telecom's Mobile Jetstream. Mr. Gustofson was impressed with the potential benefits that mobile data transmission could bring to their organization. However, he was concerned with the maturity of this emerging technology as well as the costs involved. He wanted to determine whether they should adopt this new service.

A Snapshot of Rural New Zealand

New Zealand was a modern developed economy with a population of approximately 4 million people that enjoyed high standards of living as well as one of the lowest unemployment rates in the world. Due to its geographic isolation, the country was heavily dependent on trade, particularly in agricultural products. It used to be said that New Zealand had 20 times more sheep than people. By 2001 this was no longer the case: there were only 12 times as many sheep as people. Despite the declining numbers of livestock, the agribusiness sector was still responsible for more than 20% of the country's GPD and for approximately 65% of all New Zealand's exports.

One of the problems faced by the rural sector was attracting young people to join its workforce. The difficulty to fulfilling the growing demand for skilled labor in this industry was jeopardizing its future. In order to address this issue, the government started funding Industry Training Organizations (ITOs). Under the Industry Training Act, these organizations were responsible for setting national skills standards and qualifications, administering on-and off-job training as well as developing standardized assessment arrangements. Through an apprenticeship scheme, ITOs offered to young people high-quality, mentored, work-based learning.

Agriculture ITO

Agriculture ITO, one of the largest industry training organizations in New Zealand, was a not-for-profit organization with the objective of helping people to gain the knowledge and skills they needed for a successful career in the agriculture sector. It offered New Zealand Qualifications Authority (NZQA) registered and nationally recognized qualifications in industry sectors ranging from dairy, sheep and cattle to rural servicing, wool harvesting and water industry services. Since it most served people in rural areas and some other remote locations, it had offices in Wellington, Hamilton and Christchurch which helped coordinating and delivering training and education at a regional level.

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[1]This case study was prepared by Eusebio Scornavacca at Victoria University of Wellington, New Zealand, as the basis for class discussion. The case is not intended to serve as an endorsement, source of data, or an illustration of effective or ineffective management.

Funded by government and industry, Agriculture ITO supported earn-as-you-learn training courses for farm employees in the NZ agricultural industry. The organization was in charge of enrolling, facilitating, tracking and supporting the progress of the trainees. In addition, it was required to send data on the progress of each trainee to the Tertiary Education Commission.

Trainees were a mix of school-leavers and mature agricultural employees who needed to up-skill and move forward with careers. They gained their qualifications through a mix of practical and theory-based study arranged by Agriculture ITO's field-training advisers. Practical training took place on the job, with trainees learning the ropes from experienced farmers and employers, while theory-based training happened off the job through accredited training providers either through day-release classes or distance learning. Trainees completed courses while still employed, and this education was paid for by the trainees or by their employer. In the course of 2002, Agriculture ITO facilitated training for approximately 3,000 people throughout New Zealand. Every year, they processed about 200,000 trainee results and over 450,000 attendance records.

In December 2002, Agriculture ITO had 59 employees; consisting of 29 field-training advisors, 10 field managers and administrators and 20 head office support staff.

Training Management System

By the early 2000's, Agriculture ITO was an organization buried in paper. Its manual system became so backlogged that, at peak times, field staff would turn up to visit a trainee with no up-to-date information on the person, their course, or their progress. The average time of response for a request from the field staff was three days and trainee enrolment was a three-week process. At worst, entering trainee data into the system could fall nine months behind.

Early in 2000, Myles Gustofson was employed as IT manager and immediately began to work towards the implementation of a training management system (TMS). The vision was for a fast, modern, easily administered system unique to Agriculture ITO's needs and environment and which would provide it with tools to meet key data requirements. In July 2000 the TMS project received board approval and, by July 2001 the system was rolled out to all staff. The TMS handled course results, attendance details, statistics, and produced various reports and forecasts.

When the TMS roll-out was completed it had an immediate and profound effect on the organization's efficiency and capacity – improving access to any type of data about trainees, providers, accreditation, standards, employers, and workplaces. Gustofson expected that Agriculture ITO staff would rush to the new system and embrace it on the spot. However, he soon realized that one of the biggest challenges with the TMS project was getting people to use it. "We had a few people who weren't computer literate at all and some who were a bit too literate and kept playing with settings and changing things they shouldn't."

Consequently, between July and December 2001, each Agriculture ITO staff member received several hours of training. As a result, by early 2002 the TMS was already widely adopted throughout the organization.

By the time the system had been securely implemented, field workers received Compaq laptops loaded with the application, office applications and synchronization software. As a result, data could be entered in the field, and later synchronized with the TMS via a regional office network. Field staff also had access to TMS data as up to date as the last time they synchronized with the system (see Exhibit 1).

One of the major issues faced by Gustofson was the limitations of telecommunications in the rural sector. "If you talk to our staff on a rural phone line you can often hear the tick, tick, tick caused by electric fences. Imagine what would happen to data". Also most field staff drove about 5 hours per day visiting farms where phone jacks were not available in "the next barn".

Unwired TMS

In July 2002 Telecom New Zealand started a pilot of a new data service called Mobile Jetstream. The service was based on Telecom's 027 CDMA2000 network (see Exhibit 3 for notes on mobile technology). CDMA2000 was an always-on packet data network that supported peak data rates of 153.6 kbps. Because always-on packet data networks were a shared medium, and wireless services were dependant on the signal strength, real world user experiences were typically less than the peak and in the range of 60 – 80 kbps.

As part of the pilot, Agriculture ITO's field staff received GTRAN™ Wireless PC cards to be used on their laptops. Gustofson thought that wireless data transmission could give them a second option of telecommunication for areas where a telephone line was not available or with poor data transmission rates. During the pilot, field staff were able to send and receive information at most sites and database synchronization was able to happen when they were driving or in the middle of farmland. However, network coverage was limited, especially in rural areas (see Exhibit 2). Gustafson estimated that about 25 percent of Agriculture ITO's clients were based in an area that had no network coverage at all.

Staff seemed to gain confidence in doing their job due to the increased accuracy of the information they were able to retrieve. Most Agriculture ITO's training advisers told Gustofson that having access to this sort of technology made their life easier, and they were able to work more efficiently. One of the field-training advisers mentioned: "I am out in the field to field three to four days a week and only one or two days in my office. To me, the benefit of having this technology available means that I can access information when I need - not having to wait until I get back to the office in the afternoon. Also because I work in isolation it was great to be able to pull over and check my e-mail via wireless data". In addition, field staff noticed that they could respond to enquires from trainees on the spot, without the normal two weeks delay and the consequent likelihood of losing their interest. Also Gustofson observed a "wow factor" generated by wireless technologies – customers were impressed with the new system. It certainly could contribute towards the company's image.

The final pilot report showed that the average usage of wireless data per person was 100 Mbytes/month. In addition, data transmission was underperforming - probably equivalent to a 29 kbps modem - and costs of acquisition and maintenance were quite high (see Exhibits 2).

Conclusion

In order for Agriculture ITO's field staff to continue accessing the Mobile Jetstream service, Gustofson would have to purchase hardware and choose a one of Telecom's wireless data plans. He wondered whether Agriculture ITO should adopt a service based on an emerging technology.

Exhibit 1 – AGRICULTURE ITO'S TMS Set up

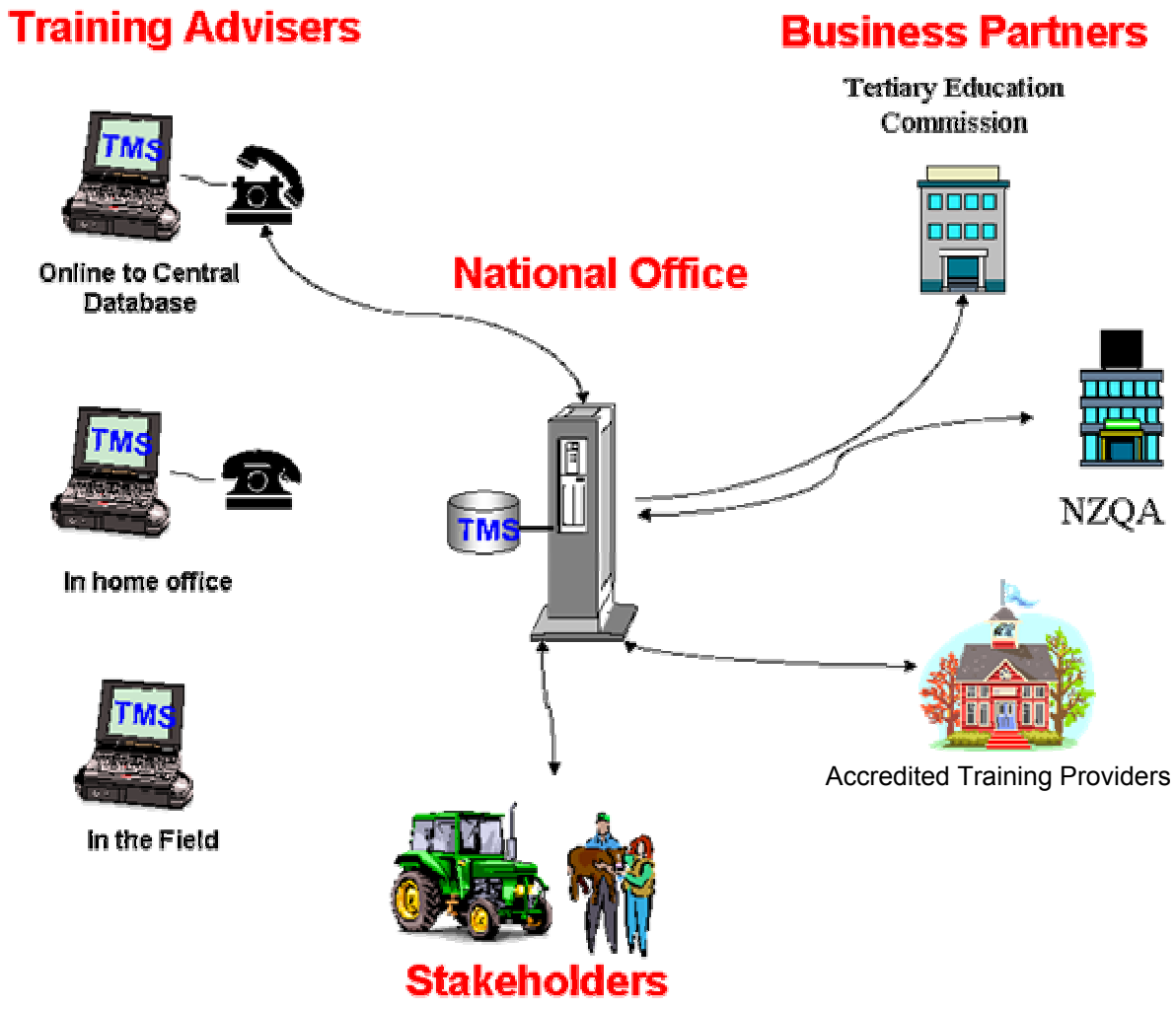

Exhibit 2 – TELECOM NZ Network Coverage and Costs (as December 2002)

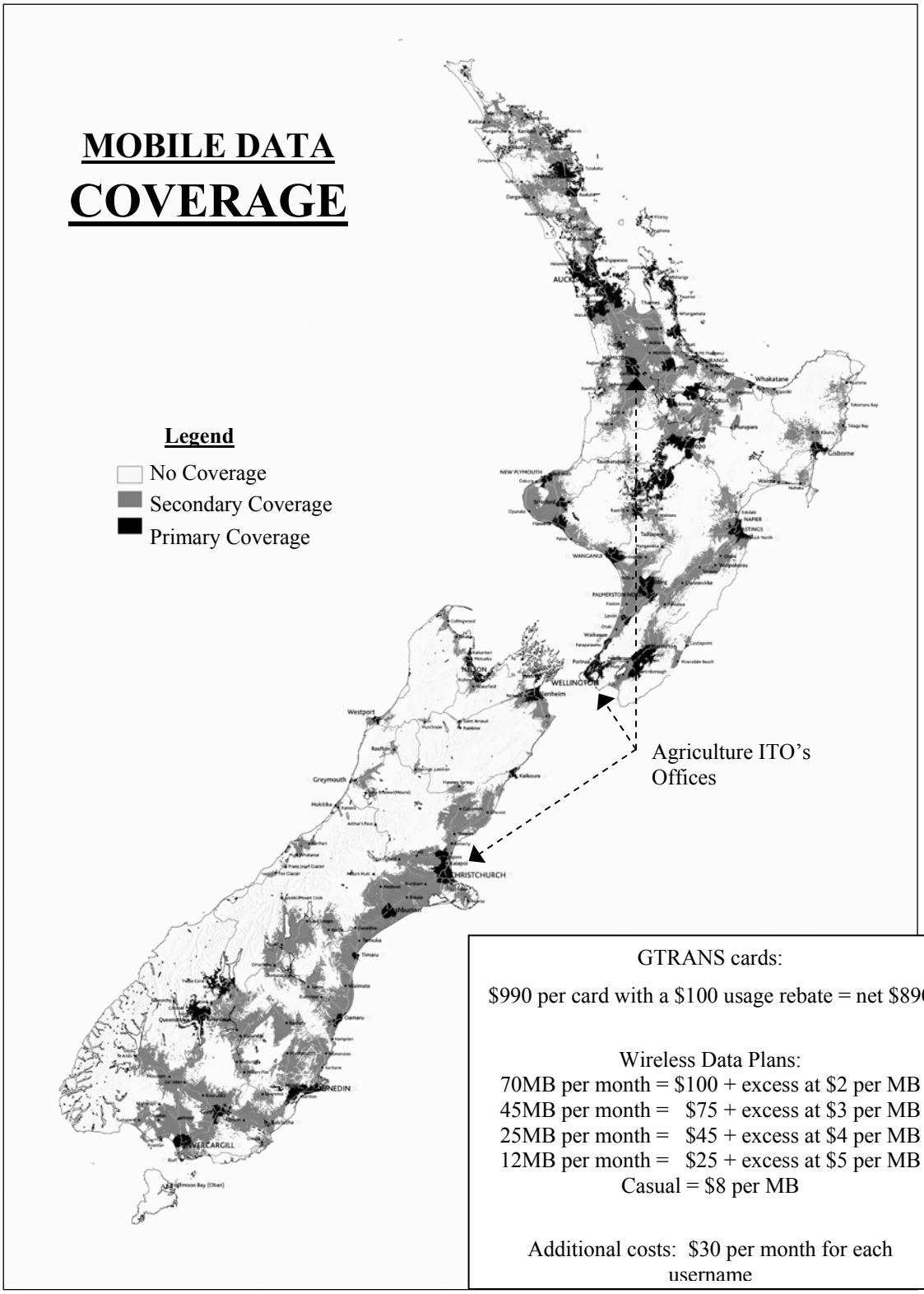

Exhibit 3 – Notes on Mobile Technology

1) Glossary of terms used in the teaching case:

CDMA2000 - It is a family of third-generation (3G) mobile telecommunications standards that use CDMA (code division multiple access), to send voice, data, and signaling data (such as a dialed telephone number) between mobile device and cell sites.

GTRAN Wireless – Manufacturer of the wireless modem (PC card)

Kbps - kilobit per second is a unit of data transfer rate. For example, a dial-up connection usually provides a speed of 56 kpps.

PC card - Portable Computer Cards are interchangeable peripherals designed to be inserted into laptop computers in order to enable extra hardware functions. Such cards include (but are not limited to) modems and network interface cards.

Wireless Modem – It provides a computing device (e.g. laptop) with an access point to a wireless network (e.g. cellular network) allowing the user to access the Internet (or some proprietary network).

2) Snapshot from an Industry Forecast from Early 2003:

With hardware and network resources becoming more established, the market for products and services has barely been tapped. The premise of wireless growth is a shift from voice to wireless data. Many operators are predicting that data traffic on their networks will exceed voice traffic by 2005[4]. For it to be profitable, wireless data must lift the average revenue per user. Therefore, there is likely to be an increasing focus on cost structure to cope with reduced revenues and margins.

Wireless revenue growth, though still strong, is expected to slow this year. Globally, the industry soared to US$417.6 million from Internet traffic in 2000. By the year 2004, revenue from wireless data will reach US$33.5 billion worldwide[5]. Having spent euro$100 billion on spectrum licenses in Europe[6], carriers are preparing to spend an equal sum to build high-speed networks.

The wireless industry continues to grow, despite the economic slowdown. Although growth is expected in most areas of the wireless industry, the upward curve is not expected to reach the grand predictions made by many in 2000. According to market research, the market for wireless narrowband, or slower-speed Net access, continues to evolve as carriers move to larger networks, upgrading infrastructure from 1999 to 2006.

Even with the recent down turn, research firms continue to forecast growth across the sector, despite the continuing decline in forecasted revenue from industry giants. Now that the mobile phone has a firm foothold in people's lives, the second stage of the cellular revolution is underway. Many analysts agree that data traffic will become more important than voice traffic by 2006 and that, by 2010, half of mobile subscribers will also be mobile internet subscribers. The mobile internet access market will cater to 136 million people by the end of 2007, thanks to the increased mobility of the workforce and the introduction of mobile-specific applications[7]. That's an increase from 2.9 million active subscribers in 2000. By 2007, 60 percent of the people in the US and Western Europe will carry wireless computing devices. That number will increase to 70 percent by 2010[8].

ComScore Networks, Inc. reports that 9.9 million internet users in the United States (US) use a PDA (personal digital assistant) or cell phone to access the internet. This analysis, which includes US persons over age 18 who used the internet from a PC in the first quarter of 2002, determined that among the 19.1 million users owning a PDA, five million access the Internet with those devices. Among the 67.2 million online users that own a cell phone, 5.8 million access the Internet with those devices[9].

It is generally anticipated that the growth of the wireless market will also drive the development of new cellular and fixed wireless technologies, which in turn will create a larger market for connectivity (via Bluetooth and ad-hoc networks), allowing wireless handheld devices, personal computers and laptops to ubiquitously work together.

Young adults aged 10-24 may be the fastest-growing market for wireless voice and data services in the United States over the next several years, reaching 43 million in 2004, up dramatically from 11 million in early 2002.[10] It is also estimated that over half of 7-16 year olds have their own mobile phones, representing a huge potential opportunity as they mature into adult consumers.

Source: MediaLab South Pacific (2003). No Wires No Limits: Report on the New Zealand Mobile Wireless Industry. MediaLab Incorporated: Wellington. Pages 14-15.

Exhibit 4 (optional) – TELECOM NZ Field Force Business case worksheet

Field Force Business Case Worksheet

Telecom

ASSUMPTIONS

Number of Mobile Staff	1
Solution Lifespan in Months	1

WIRELESS COSTS

CAPITAL SETUP COSTS

PER USER CAPITAL SETUP COSTS

Hardware Components (per unit)	-
Application Software (per unit)	-
Host / Mobile Integration (per unit)	-
Installation (per unit)	-
Training (per person)	-
Other (per unit)	
Subtotal	-
x **Number of Mobile Staff**	1
1 **TOTAL USER CAPITAL SETUP COSTS**	-

SERVER CAPITAL SETUP COSTS

Hardware Components	-
Server Software	-
Installation	-
Training	-
Other	
2 **TOTAL SERVER CAPITAL SETUP COSTS**	-

TOTAL CAPITAL SETUP COSTS (1 + 2) -

MONTHLY OPERATIONAL COSTS

Network Fees	-
Support Costs	-
Landline Links	-
Other	-
TOTAL MONTHLY OPERATIONAL COSTS	-

WIRELESS BENEFITS

HUMAN RESOURCE SAVINGS - MOBILE AND OFFICE STAFF

PRODUCTIVITY BENEFITS

Estimated dollar value of increase in field staff productivity due to wireless use

	HOURLY RATE ($)
Average hourly rate per staff member	$0

	HOURS PER WEEK
Mobile Staff make more client calls per day	-
Immediate access to information/databases	-
Access to facsimile	-
Reduced travel - Routing & Dispatch	-
Reduced travel - Access to Information	-
Improved communication using email	-
TOTAL MONTHLY SAVINGS	$0

ADDITIONAL PROPOSALS

Increased productivity and time in front of customers generates additional sales opportunities and proposals

Additional proposals generated (Hrs/week)	-
Additional time in front of client (Hrs/week)	-
Average Sale ($)	$0
Average number of Sales per Sales person (Yr)	-
Number of Sales Staff	1
TOTAL MONTHLY REVENUE	$0

APPLICATION DEMONSTRATION

Productivity benefits associated with being able to demonstrate on site rather than separate appointments, etc

	1	Number of Mobile Staff
x	0	Hours saved per week
x	$0	Hourly Pay Rate
=	**TOTAL MONTHLY SAVINGS**	$0

OTHER Reduced errors in entry due to Mobile Staff entering directly

SHORTER SALES CYCLE

-	Reduction in sales cycle, (weeks)
$0	Average sale
-	Average number of sales per year/ per sales member
1	Number of Mobile Staff
TOTAL ANNUAL REVENUE GENERATED	$0
Monthly	$0

INCREASED CUSTOMER SATISFACTION

Reduction in Churn

Number of Customers per Sales person	-
Average ABR ($)	$0
Current Churn %	0.0%
Reduction in Churn %	0%
TOTAL ANNUAL REVENUE GENERATED	$0
Monthly	$0

COMPETITIVE ADVANTAGE

Superior sales ability, improves customer perception

Total Market Size ($)	$0
Current market share (%)	0%
Increase in Market Share over project	0.0%
TOTAL ANNUAL REVENUE GENERATED	-
Monthly	$0

TOTAL COST OVER ESTIMATED LIFESPAN

	TOTAL CAPITAL SETUP COSTS	-
+		
	MONTHLY OPERATIONAL COSTS	-
x	LIFESPAN IN MONTHS	1
=	**LIFESPAN OPERATIONAL COST**	-
TOTAL COSTS OVER LIFESPAN		-
...OR MONTHLY COST OVER LIFESPAN		-

TOTAL SAVINGS AND REVENUE OVER ESTIMATED LIFESPAN

	SAVINGS	$0
+		
	REVENUE	$0
TOTAL MONTHLY SAVINGS AND REVENUE		$0
x	1 Estimated Lifespan in months	
TOTAL SAVINGS AND REVENUE OVER LIFESPAN		-

NET BENEFIT OF IMPLEMENTING A WIRELESS SOLUTION

Annually	-
Monthly	-