NET 1 UEPS TECHNOLOGIES INC
Form 10-K
August 28, 2008

UNITED STATES
SECURITIES OF EXCHANGE COMMISSION

Washington, D.C. 20549

FORM 10-K

[X] ANNUAL REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934

For the fiscal year ended **June 30, 2008**

or

[ ] TRANSITION REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934

For the transition period from _____ to _____

Commission file number: **000-31203**

NET 1 UEPS TECHNOLOGIES, INC.

(Exact name of registrant as specified in its charter)

Florida	**98-0171860**
(State or other jurisdiction of incorporation or organization)	(I.R.S. Employer Identification No.)

President Place, 4th Floor, Cnr. Jan Smuts Avenue and Bolton Road
Rosebank, Johannesburg 2196, South Africa
(Address of principal executive offices)

Registrant s telephone number, including area code: **27-11-343-2000**

Securities registered pursuant to section 12(b) of the Act:

Title of Each Class	Name of Each Exchange on Which Registered
Common Stock, par value $0.001 per share	**NASDAQ Global Select Market**

Securities registered pursuant to section 12(g) of the Act:
None

Indicate by check mark if the registrant is a well-known seasoned issuer, as defined in Rule 405 of the Securities Act. **Yes [X] No [ ]**

Indicate by check mark if the registrant is not required to file reports pursuant to Section 13 or Section 15(d) of the Act. **Yes [ ] No [X]**

Indicate by check mark whether the registrant (1) has filed all reports required to be filed by Section 13 or 15(d) of the Securities Exchange Act of 1934 during the preceding 12 months (or for such shorter period that the registrant was required to file such reports), and (2) has been subject to such filings requirements for the past 90 days. **Yes [X] No [ ]**

Indicate by check mark if disclosure of delinquent filers pursuant to Item 405 of Regulation S-K (§229.405) is not contained herein, and will not be contained, to the best of registrant's knowledge, in definitive proxy or information statements incorporated by reference in Part III of this Form 10-K or any amendment to this Form 10-K. **[ ]**

Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, or a smaller reporting company. See the definitions of large accelerated filer, accelerated filer, and smaller reporting company in Rule 12b-2 of the Exchange Act (Check one):

[X]	Large accelerated filer	[ ]	Accelerated filer
[ ]	Non-accelerated filer	[ ]	Smaller reporting company

(Do not check if a smaller reporting company)

Indicate by check mark whether the registrant is a shell company (as defined in Rule 12b-2 of the Exchange Act). **Yes [ ] No [X]**

The aggregate market value of the registrant's common stock held by non-affiliates of the registrant as of December 31, 2007 (the last business day of the registrant s most recently completed second fiscal quarter), based upon the closing price of the common stock as reported by The Nasdaq Global Select Market on such date, was $1,038,513,406. This calculation does not reflect a determination that persons are affiliates for any other purposes.

As of July 31, 2008, 53,142,911 shares of the registrant s common stock, par value $0.001 per share, and 4,856,801 shares of the registrant s special convertible preferred stock, par value $0.001 per share, which are convertible into common stock on a one-for-one basis, were outstanding.

DOCUMENTS INCORPORATED BY REFERENCE

Certain portions of the definitive Proxy Statement to be delivered to shareholders in connection with the 2008 Annual Meeting of Shareholders are incorporated by reference into Part III of this Form 10-K.

NET 1 UEPS TECHNOLOGIES, INC.

INDEX TO ANNUAL REPORT ON FORM 10-K
Year Ended June 30, 2008

	Page
PART I	
Item 1. Business	2
Item 1A. Risk Factors	30
Item 1B. Unresolved Staff Comments	46
Item 2. Properties	47
Item 3. Legal Proceedings	47
Item 4. Submission of Matters to a Vote of Security Holders	47
PART II	
Item 5. Market for Registrant s Common Equity, Related Shareholder Matters and Issuer Purchases of Equity Securities	48
Item 6. Selected Financial Data	50
Item 7. Management s Discussion and Analysis of Financial Condition and Results of Operations	52
Item 7A. Quantitative and Qualitative Disclosures About Market Risk	92
Item 8. Financial Statements and Supplementary Data	93
Item 9. Changes in and Disagreements with Accountants on Accounting and Financial Disclosure	94
Item 9A. Controls and Procedures	94
Item 9B. Other Information	96
PART III	
Item 10. Directors, Executive Officers and Corporate Governance	97
Item 11. Executive Compensation	97
Item 12. Security Ownership of Certain Beneficial Owners and Management and Related Shareholder Matters	97
Item 13. Certain Relationships and Related Transactions, and Director Independence	97
Item 14. Principal Accountant Fees and Services	97
PART IV	
Item 15. Exhibits and Financial Statement Schedules	98
Signatures	102
Financial Statements	F-1

PART I

FORWARD LOOKING STATEMENTS

In addition to historical information, this Annual Report on Form 10-K contains forward-looking statements that involve risks and uncertainties that could cause our actual results to differ materially. Factors that might cause or contribute to such differences include, but are not limited to, those discussed in Item 1A. Risk Factors. In some cases, you can identify forward-looking statements by terminology such as may, will, should, could, would, expect intends, anticipates, believes, estimates, predicts, potential or continue or the negative of such term comparable terminology. You should not place undue reliance on these forward-looking statements, which reflect our opinions only as of the date of this Annual Report. We undertake no obligation to release publicly any revisions to the forward-looking statements after the date of this Annual Report. You should carefully review the risk factors described in other documents we file from time to time with the Securities and Exchange Commission, including the Quarterly Reports on Form 10-Q to be filed by us in our 2009 fiscal year, which runs from July 1, 2008 to June 30, 2009.

ITEM 1. BUSINESS

Overview

We provide our universal electronic payment system, or UEPS, as an alternative payment system for the unbanked and under-banked populations of developing economies. We believe that we are the first company worldwide to implement a system that can enable the estimated four billion people who generally have limited or no access to a bank account to enter affordably into electronic transactions with each other, government agencies, employers, merchants and other financial service providers. To accomplish this, we have developed and deployed the UEPS. This system uses secure smart cards that operate in real-time but offline, unlike traditional payment systems offered by major banking institutions that require immediate access through a communications network to a centralized computer. This offline capability means that users of our system can enter into transactions at any time with other card holders in even the most remote areas so long as a smart card reader, which is often portable and offline, is available. In addition to payments and purchases, our system can be used for banking, health care management, international money transfers, voting and identification.

We generate our revenues by charging transaction fees to government agencies, employers, merchants, retailers, petroleum suppliers and other financial service providers, by providing financial services such as loans and insurance products and by selling hardware, licensing software and providing related technology services including secure online transaction processing, cryptography and integrated circuit card (chip/smart card) technologies. Our technology is widely used in South Africa today, where we have over 4.0 million clients in five provinces who receive social welfare grants using our smart cards and increasingly use their smart cards at participating merchants to receive and spend their grants. In addition, our technology has been selected and implemented by the Central Bank of Ghana as the common electronic payment platform in Ghana and we are in the process of completing a project to provide a consortium in Iraq with a customized UEPS banking and payment system that we will operate on an outsourced basis. As part of our strategy to expand into new geographical markets we have formed joint ventures in Namibia and Botswana to operate UEPS smart card-based switching systems in those countries and in Colombia and Vietnam to implement and operate virtual top-up, or VTU, solutions for mobile phone-based prepaid airtime vending. As these UEPS systems become operational, we generate revenues from sales of equipment, software and related technology to the joint ventures and from our share of the revenues earned by the ventures from operation of the switching systems.

We are headquartered in Johannesburg, South Africa. Net 1 UEPS Technologies, Inc. was incorporated in 1997 as a Florida corporation and is the successor to operations originally begun in 1989. Under -Corporate History below, we describe the historical development of our business, including the June 2004 acquisition of Net1 Applied Technologies Holdings Limited, or Aplitec, which was a South African public company. All references to Net1, the

Company, we, us, or our are references to Net 1 UEPS Technologies, Inc. and its consolidated subsidiarie collectively, except as otherwise indicated or where the context indicates otherwise.

On August 27, 2008, we acquired 80.10% of BGS Smartcard Systems AG, or BGS, an Austrian private company that provides smart card-based payment systems to banks, enterprises and government authorities in Russia, Ukraine, Uzbekistan, India and Oman. See Item 7. Management s Discussion and Analysis of Financial Condition and Results of Operations Trends and Material Developments Affecting our Business Acquisition of BGS Smartcard Systems AG.

Market Opportunity

According to the United States Census Bureau, the world s population currently exceeds 6.7 billion people. Yet of this total, it has been reported that over four billion people earn less than the purchasing parity equivalent of two dollars per day. In general, these people either have no bank account or very limited access to banking services. This situation arises when banking fees are too high relative to an individual s income, a bank account provides little or no meaningful benefit or there is insufficient infrastructure to provide banking services economically in the individual s geographic location. We refer to these people as the unbanked and the under-banked. These individuals generally receive wages, welfare benefits, money transfers or loans in the form of cash and conduct commercial transactions, including buying food and clothing, in cash.

The use of cash, however, presents significant problems. In the case of recipients, they generally have no secure way of protecting their cash other than by converting it immediately into goods, carrying it with them or hiding it. In cases where an individual has access to a bank account, the typical deposit, withdrawal and account fees meaningfully reduce the money available to meet basic needs. For government agencies and employers, using cash to pay welfare benefits or wages results in significant expense due to the logistics of obtaining that cash, moving it to distribution points and protecting it from theft.

The use of cash or lack of access to a bank account can dramatically increase the cost to, and in some cases completely prevent, individuals from engaging in basic financial transactions. These basic transactions include the routine payment of insurance premiums, the transfer of money to relatives and the use of credit. Without a bank account, it is also difficult for an individual to obtain a loan on attractive terms since that individual lacks a credit history and usually cannot present a reliable means of repayment to the lender.

For governments, assistance programs face significant challenges when dependent on the use of cash. In addition to the costs and difficulties of using cash, corruption becomes an even more challenging problem since there is no clear audit trail. In fact, the absence of an electronic system for the distribution of goods, including foodstuff or medicine, or welfare benefits presents a significant obstacle to ensuring the fair and reliable implementation of government policy or deployment of foreign aid.

Traditional payment systems offered today by the major banking institutions do not address the key requirements of the unbanked and the under-banked populations. In addition to the high cost of maintaining a bank account relative to a customer s income level, customers must generally have basic literacy, administrative and record-keeping abilities and a minimum income level. Additionally, banks operate through online transaction settlement systems, which are often unavailable or costly to implement in undeveloped areas. Finally, having a bank account does not eliminate the need for significant quantities of cash in many instances because customers must withdraw large sums at one time to avoid incremental transaction fees.

Our Solution

We believe that we are the first company to enable the affordable delivery of financial products and services to the world s unbanked and under-banked people. Our approach takes full advantage of moving processing away from a centralized point to the computer chip embedded on a smart card. A smart card reader, or POS device, is used to enable communication between smart cards in real-time during a transaction and indirectly with our mainframe computer at a later time. This architecture has significant implications in terms of the products and services that we can deliver compared to those offered by banking institutions or other card providers.

First, our system enables offline transactions, which is essential in serving the unbanked and under-banked. Second, it means that while offline, the smart card can engage in sophisticated transaction processing, using data encryption and biometric fingerprint protection to ensure security. In fact, our smart cards can calculate the interest owed to the card holder for having funds recorded onto our system without ever coming online. Third, with all of the

software and transaction records on the smart card, the POS device itself requires far fewer components, circuitry and memory, substantially reducing costs. Fourth, each transaction is recorded on both participating smart cards, copied in subsequent transactions to additional smart cards, and ultimately reported to our mainframe computer. This creates a full audit trail that significantly reduces the potential for corruption, theft and fraud. Lastly, instead of having to build the overall system to handle peak loads, our system further reduces costs by smoothing the transaction flow over time.

We believe that our solution delivers benefits to each of the users of our system, including:

Individuals. There is no minimum income requirement for individuals to use our smart card, making our solution universally accessible. It is also inexpensive since the overall cost of the system is much less than widely available solutions, including cash, bank accounts and bank cards that require online access. Our solution additionally has the advantage of working everywhere, including remote areas where many unbanked and under-banked people live. Even more importantly, our solution is secure and smart cards are replaceable. This means that individuals do not have to fear that their money will be stolen or that they will be charged for fraudulent transactions as all transactions are verified biometrically through fingerprints. Since the smart card performs all of the required computing processing and contains all of the different service features, the smart card can be tailored to meet the needs of the individual. Card holders can also receive interest on their card balances, a benefit not available to them when transacting solely in cash. We believe our solution has the potential to enhance significantly the living standards of the unbanked and under-banked by reducing transaction costs and providing them with new and additional financial products and services.

Merchants and Financial Service Providers. Merchants derive several different benefits from our system. Our system decreases the amount of cash they must hold, improving security and reducing expenses, such as cash deposit fees and cash losses. By providing financial services through our POS devices, merchants also benefit from new income streams at no additional incremental cost. In addition, our system provides a record of transactions that is useful for administrative purposes. For formal financial service providers, the use of smart cards provides opportunities to directly sell products and services to a market that was previously difficult to reach. For instance, insurance companies can offer their products with the premium deducted directly from the individual s smart card. In the case of lending, administrative costs are decreased along with the expense of holding cash. Again, the collection of payments can occur directly from the smart card, reducing credit risk and helping to establish credit history.

Employers. Our system enables employers to eliminate cash from the wage payment process. This reduces expenses by avoiding cash handling and management, the need to insure, secure and transport that cash and the bank transaction fees associated with obtaining cash in the first place. The process of paying employees using cash is also time consuming, taking up to half a day per pay period in some instances. The use of our system eliminates this process and thereby increases productivity. In addition, because cash payments are distributed in packets to employees, disputes can arise as to the amount of cash in the packet. Our system also eliminates this problem since the amount reflected on the card holders accounts are recorded on the back-end system and then distributed on the smart cards. Finally, employers frequently provide additional services to their employees out of necessity, particularly loans. Our system enables other service providers to deliver these products.

Government Agencies. A fundamental policy goal for almost any government is to enhance the welfare of the poorest citizens in the country. Yet the use of cash is a poor method for delivering social welfare grants since it is difficult to track, and the recipients endure a range of expenses and dangers that reduce their options. By using our system, government agencies enjoy reduced costs in the delivery of benefits to recipients by eliminating the use of cash while increasing the options available to the recipient. This use of our system intrinsically increases the welfare that government agencies can provide from the same amount of taxes collected. Our system also has the potential to increase the amount of taxes collected by bringing informal businesses into the formal economy. The presence of a full audit trail also means that government agencies can combat corruption. Moreover, the use of smart cards for the delivery of additional services, including insurance products, means that regulatory bodies can expand their oversight of transactions for individuals who are frequently least able to protect themselves. In regard to medical benefits, our system provides comprehensive inventory management and has the potential to improve the treatment of patients significantly.

Our Business Strengths

We believe our business strengths include:

Technology Leadership. We believe we are the first company to develop, implement and operate an affordable, flexible and secure electronic payment system for the unbanked and under-banked that works offline. Of equal importance, our smart cards are secured through biometric fingerprint authentication and have a broad range of additional functionality through the use of wallets that can be turned on as needed or as services become available. We can deliver these services to the unbanked population at a fraction of the cost of traditional systems. Our ability to implement an HIV/AIDS system on the same smart card as financial services demonstrates the flexibility of our approach. In addition, we have validated the security of our smart cards along with our overall system, forming the foundation for a trusted solution. Independent third parties have reviewed and published our security protocols and we have refined our system in a way to provide system integrity over the life of the smart cards. From our inception in 1989 to date, we have not suffered any security breaches or losses of transactions or funds on our system. In addition, our acquisition of Prism gave us access to well-established core cryptography, software, hardware, embedded chip, wireless and payment expertise.

Proven Solution. Our system is proven is widely used. Today over 4 million clients in South Africa receive monthly welfare or pension payments through our system under contracts with five provinces. Historically, welfare and pension recipients would only download cash from smart cards, but since we began our merchant acquiring initiative in July 2004, these recipients increasingly choose to use their smart cards at merchant locations, which generate additional revenues for us. During the year ended June 30, 2008, the number of our clients that opted to receive their grants through our retail infrastructure grew to approximately 1,426,000, an increase from approximately 1,129,000 and 849,000 during fiscal 2007 and 2006, respectively. For the years ended June 30, 2008 and 2007, the total value of transactions processed through our UEPS merchant network was approximately $1,078 million and $875 million, respectively. As of June 30, 2008, we had 4,394 POS devices installed at 2,454 participating retail merchants compared to June 30, 2007, when we had 4,357 POS devices installed at 2,598 participating retail merchants

Versatile Application. Once an individual begins using our smart card, we become a logical provider of a broad range of additional products and services. For instance, a card holder using our system for the administration of medical treatment can also use the same smart card for receiving welfare payments or wages as well as making purchases. Because use of each smart card is secured biometrically, the smart card can also be used for identification and voting. The additional uses mean that once we have enrolled and delivered a smart card to an individual, our revenue potential increases significantly beyond the initial service for which that individual has signed up.

Broad Appeal that Drives Opportunities. Because our system provides economic benefits to all participants, we believe there are strong incentives for government agencies and employers to adopt our system in many developing countries. Our solution is also appealing because a single deployment enables the delivery of a broad array of new services to those who are potentially most in need of them, often at a lower cost than alternative distribution methods.

Increasing Returns to Scale. The initial establishment of our system in a province or country requires upfront expenditures for computers, distribution infrastructure and card holder registration. Once in place, though, the cost to us of supplying additional products to users is low. For instance, if a customer receives welfare payments on one of our smart cards and then chooses to purchase insurance through our system, there is almost no additional expense for us to deduct the insurance premium regularly. As a result, the operating margin for that customer increases significantly, offset only by any marketing or administrative costs associated with that product.

Our Strategy

We intend to provide the leading system for the world s estimated four billion unbanked and under-banked people to engage in electronic transactions globally. To achieve this goal, we intend to pursue the following strategies:

Disciplined Approach to New Markets. We carefully evaluate new opportunities in order to deploy our business development resources effectively. We believe there are significant opportunities for our system in the developing countries of Africa, Central and South America, the Middle East, the Asia-Pacific Rim and Central and Eastern Europe, where the unbanked and under-banked comprise a majority of the population. Where we believe it makes sense, we will use partnerships or make acquisitions to accelerate our entry into new markets. For instance, during our 2007 and 2006 fiscal year, we established, together with local investors, companies to create and implement UEPS systems in three African countries, Namibia, Botswana and Nigeria. In other instances we may implement UEPS systems in a particular market. For instance, during fiscal 2008 we implemented a National Switch and Smart Card Payment System in Ghana and we entered into a contract with an Iraqi consortium to provide a customized UEPS banking and payment system that we will operate on an outsourced basis.

Unlock Target Markets with a Key Product. The first step in establishing our system within a new province or country is to establish a broad base of smart card users around a single application. One of our preferred routes is to secure contracts to implement payment systems for government programs having large numbers of potential card holders. We believe another effective route will be the delivery of medical management applications, such as for HIV/AIDS. However, we are not dependent on government agencies to establish an initial base. In South Africa, employers have examined our system to address their wage payment challenges and we are currently pursuing opportunities to deliver this solution. Similarly, banking institutions implement the UEPS banking application and distribute smart cards to their clients to replace ageing legacy systems, including paper or book- based systems.

Expand Our Products Within the Markets We Serve. With the establishment of a strong base of card holders and related infrastructure, we can then move to providing additional products and services. As part of broadening our card holders options, we will also sell our smart card readers and POS devices to merchants to enable them to enter into transactions. Additionally, we will work to establish relationships with post offices, banks and other financial service providers with the goal of making our system ubiquitous in the markets we serve.

Provide Products and Services Ourselves Where the Profit Potential is Compelling. Our system can dramatically reduce transaction costs and improve data collection for a broad set of products and services. We intend to offer those products and services ourselves where the profit potential is significant. For instance, we engage in lending in South Africa. We are able to offer this service at a lower interest rate than competitors due to our ability to deduct interest and principal directly from a borrower s smart card and our knowledge of that individual s payment history.

Establish Partnerships or Make Acquisitions When Appropriate. As part of our disciplined approach to growing our presence globally, we will evaluate and enter into partnerships or outsourcing agreements where we can draw on local knowledge and infrastructure to drive the rapid adoption of our system. We believe that this will enable us to focus on our core strength in technology as well as product development and delivery. In some instances, we will make acquisitions where we believe that our approach will enable us to gain customers and realize operational benefits rapidly from the deployment of our more efficient solution.

Our Technology

We developed our technology to enable the affordable delivery of financial products and services to the world s unbanked and under-banked people. Our proprietary technology is designed to provide the secure delivery of these products and services in the most under-developed or rural environments, even in those that have little or no communications infrastructure. Unlike a traditional credit or debit card where the operation of the account occurs on a centralized computer, each of our smart cards effectively operates as an individual bank account for all types of

transactions. All transactions that take place through our system occur between two smart cards at the point of service, or POS, as all of the relevant information necessary to perform and record transactions reside on the smart cards.

The transfer of money or other information can take place without any communication with a centralized computer since all validation, creation of audit records, encryption, decryption and authorization take place on, or are generated between, the smart cards themselves. Importantly, the cards are protected through the use of biometric fingerprint identification, which is designed to ensure the security of funds and card holder information. Transactions are generally settled by merchants and other commercial participants in the system by sending transaction data to a mainframe computer on a batch basis. Settlements can be performed online or offline. The mainframe computer provides a central database of transactions, creating a complete audit trail that enables us to replace lost smart cards while preserving the notional account balance, and to identify fraud.

System Components

Our platform consists of three fundamental components: (1) our FTS patent, (2) our UEPS and (3) our security protocol.

FTS Patent. The FTS patent describes a method by which funds can be transferred from one smart card to another in a secure and offline manner. The term offline refers to transactions that are effected without the need to contact or communicate with the issuer when the transactions occur, as the smart cards themselves perform the authorizations required. The FTS patent also describes how smart cards can be loaded or re-loaded with funds and how these can be redeemed for value in either banking or non-banking environments.

UEPS. Our UEPS is a suite of software programs that make use of the FTS methodology to deliver an integrated information, payment, switching and settlement environment that underpins our transaction processing system. Our software principally runs on three devices: the smart card, the POS device and the back-end system mainframe. When we sell a complete system to a customer or license our technology, we provide all of the software required to operate the UEPS, including the smart card functionality, the POS devices that allow our smart cards to transact with each other in an offline manner and our back-end system that primarily stores an audit trail of all transactions effected.

The primary strengths of the UEPS are its affordability, security and flexibility. The system is affordable because the computer chips on the smart cards contain all the software necessary to process UEPS transactions, thereby allowing the POS devices required to conduct these transactions to contain far fewer components and less circuitry than traditional POS devices. There is also a reduced need for processing power and on-board memory given that online communication is not necessary. This eliminates the need for an internal or external modem and its associated hardware, maintenance and call costs. As a result, the UEPS terminals are relatively inexpensive and do not require specialized technical expertise for installation. The UEPS also reduces or eliminates the need for national infrastructures, including electricity, telephone or data transmission. The UEPS is secure because the funds in each smart card are protected from illegal access through biometric fingerprint technology. In addition, every transaction is verified by the two smart cards involved in the transaction using state-of-the-art cryptographic systems in conjunction with protocols and techniques that we have developed. Finally, our UEPS is flexible because transactions are completed offline, eliminating virtually all restrictions where verified transactions can occur.

We released the first version of our UEPS in 1991. It included software to operate each smart card as well as the main payment system. Later versions of our UEPS provided all of the functions necessary to issue and manage a smart card and terminal base as well as those needed to effect settlement between all of the operators and participants. Our UEPS is fully traceable and auditable. It can also provide advanced capabilities including loss tolerance and smart card-based interest distribution. Finally, our UEPS is scalable and capable of working in small applications including a hospital setting as well as large settings such as country-wide implementations.

Security Protocol. Our security protocol was designed to prevent opportunistic fraud and enforce the correct transaction flow. The symmetric triple data encryption standard, or DES, is used extensively in association with a native random number generator that ensures that all transactions are performed by using a random session key pair. The DES encryption algorithm can be easily modified to use alternative symmetric or asymmetric encryption

algorithms such as the Rivest, Shamir and Adleman or elliptic curves. Each message exchanged during a transaction names both transacting parties, includes unique information to guarantee freshness and depends explicitly on all the messages that occur before it.

Our UEPS Platform

The following diagram depicts how our UEPS platform is constructed.

UEPS PLATFORM
Fully-functional and integrated payment and settlement system, capable of operating all UEPS products and systems.

COMPLETE SYSTEMS
Combination of products meeting a client s particular requirements.

STAND-ALONE PRODUCTS
Financial transaction applications (S2S products).

FUNCTIONALITY
Combination of Hardware and Operating Systems on smart cards enable the creation of UEPS applications which can be customized for the particular needs of a client.

OPERATING SYSTEMS	
Third-party software.	UEPS software programmed by us.

SMART CARDS / SIM CARDS (Hardware)
Cards sourced from third-party vendors.

HARDWARE
POS devices, ATMs, mobile phones, back-end computer systems sourced from third-party vendors.

The UEPS we sell to clients is a platform with the potential to provide all of the products we develop which, when grouped together, form complete systems serving the specific needs of various business segments. Depending on the requirements of a particular customer, we assist the customer in the setup of its application which is tailored to provide only the products and services initially required, although the UEPS can later be updated to provide additional products. We outsource the manufacturing of the hardware components of our system, including smart cards, POS devices, automated teller machines, or ATMs, PCs and back-end mainframes. However, we have developed all of our application software modules so that they will run on different hardware platforms which allow us to be hardware-independent and to provide our customers with the latest and most economical hardware solutions.

Scalability. Our UEPS can be implemented in different environments, from small closed systems to national implementations. In closed-system environments, the UEPS front-end equipment is personal computer-based and can therefore be implemented at relatively low cost. In these instances, we provide the back-end system on a transaction fee basis, thus limiting the overall set up cost. This approach can also be used whenever larger implementations are required but where the customer prefers to focus on marketing and selling its products rather than initially concentrating on operating the back-end system. The cost to entry can thus be greatly reduced as the operations can first become profitable before expending large amounts of capital. On the other hand, large governmental institutions, financial institutions or medical insurers typically prefer to maintain control over the entire payment system and therefore invest in a full system implementation. The time to launch these projects tends to be longer due to the time that is required to train the end-user to operate the system.

Once a UEPS is installed on behalf of a customer, we believe that we are well-positioned to benefit from the scalability of the system as minimal changes are required to be made to the application base for the system to manage significantly greater numbers of users. We can therefore provide additional smart cards while leveraging the existing cost base in a market. In addition, we have a dedicated team of technicians and developers and an infrastructure capable of supporting a significant volume of customers and their transactions. As a result, we expect to benefit from economies of scale that pertain to increases in the number of products and services using the infrastructures we sell and/or implement.

UEPS Smart Card Functionality

We have combined these technologies to create a smart card application that incorporates and controls the functionality that is normally found on banking host systems. Our technology reverses the traditional approach where the card acts as an access mechanism to a host-managed account. Instead, the smart card controls the account itself while the host system is relegated to backing up and creating an audit trail for the smart card base.

As a result, our technology provides extensive and flexible functionality through a system that is practical, secure and auditable. The following list itemizes some of the unique and critical functions provided by our smart card technology.

Identification, Authentication, Non-Repudiation and Affirmation of UEPS Transactions. Traditional payment systems provide customers with paper receipts that reflect transaction details. Customers normally keep these receipts to reconcile their monthly account statements. During reconciliation, customers can detect fraudulent transactions and errors by matching account entries against their paper receipts, which may lead to disputes, financial losses and the repudiation of transactions. Fraud committed by people taking advantage of the inherent security weaknesses of traditional payment systems increases the cost of managing transactions effected through these systems. As a result, financial institutions and other system participants must invest significant resources to minimize the risk associated with fraud and errors.

A fundamental element of the UEPS is that all payment and money transfer transactions take place between two UEPS smart cards the smart card to be debited and the smart card to be credited. During the transfer of value between the two smart cards, the transaction is written to a dedicated history file on each of the smart cards. These history files

are subsequently used to ensure settlement either directly or through the activation of the UEPS multiple streams audit trail feature. Thus, smart card holders can reconcile their monthly accounts directly from the smart card s transaction history file. Also, each smart card authorizes all debit transactions through the presentation and verification of one of the card holder s biometric fingerprint templates that are stored in the smart card, and each UEPS transaction is signed by both smart cards. Taken together, these features of the UEPS help prevent the fraudulent creation, duplication or alteration of a transaction, as well as any potential repudiation of a transaction. As a result, the UEPS helps to minimize the costs associated with account management and inquiry resolution and helps ensure that customers do not incur losses from undetected errors, fraud or transaction mismanagement.

Continuous Debit. People with limited economic means or un-established credit histories may find it difficult to obtain access to public utility services such as telephone, fuel, water or electricity unless they purchase pre-paid units for these services. A prepaid unit of service may be a liter of fuel, a kiloliter of water, ten minutes of electricity or a two minute local phone call, and may need to be used within a specified period of time before it expires. Pre-paying for services can deprive purchasers of flexibility to redeploy their funds to meet other financial needs.

The continuous debit feature of the UEPS eliminates the need for customers to buy pre-paid units by allowing them to use their smart cards to pay for these services as and when they need and use them. All a customer needs to do is to insert his smart card into the utility equipment and the smart card will debit itself whenever a unit of service is used. The continuous debit feature provides significant financial flexibility to customers and can be tailored to be used in any pay as you go environment, including Internet access.

Continuous debit transactions are typically a large number of small transactions that can quickly fill up the space on a smart card s transaction file. We eliminated this problem by designing the UEPS to minimize the file space that these transactions require by enabling subsequent transactions to replace and aggregate with earlier ones, thereby treating multiple transactions as one global transaction.

Multiple and Restricted Wallets. Unbanked people who keep their cash at home risk the loss of their funds from misplacement, theft or disasters such as floods or fires, which can have a devastating impact on their financial lives. Keeping funds at home does not generate any interest income and cannot help demonstrate financial responsibility or provide collateral security for the extension of credit. Finally, keeping funds in cash can make it more difficult for people to segregate their funds for specific purposes, whereas having one or more bank accounts can facilitate budgeting for various categories of expenses.

The multiple wallet feature allows card holders to use their smart cards to help manage their budgets. Up to 255 wallets can be configured and activated per card holder depending on the electrically erasable programmable read-only memory, or EEPROM, available on the particular smart card. Each of the wallets can be configured to meet the specific requirements of the card holder, and can be used for interest-generating savings, pre-paid utilities, medication management, credit, debit orders and for many other purposes. In addition, a wallet can be either protected or unprotected. Protected wallets require the biometric verification of the card holder to effect transactions. Unprotected wallets are normally used for low value transactions such as transportation for which speed of processing is critical.

Since the audit trail of all transactions performed by the active wallets is stored on the smart card s history file, card holders can provide third parties with a comprehensive record of their transaction histories, which can help evidence payments, such as insurance premiums and demonstrate a regular income stream from wages or other sources. This audit trail can provide unbanked people the opportunity to obtain affordable services from formal financial service providers which might otherwise deny or limit services to them.

Wallets can also be restricted. Restricted wallets allow transactions to be performed only at specific merchants. For example, if an employer desire to subsidize an employee s transportation costs, a wallet can be configured that permits the holder to spend the value loaded into that wallet only at specified transportation points. Restricted wallets can also be used by governments to prevent social welfare grant recipients from using payment for particular goods or services.

Offline Loading. The use of payment systems that depend on online authorizations is difficult to implement in developing economies and countries that do not have advanced or reliable telecommunication infrastructures. Online systems include magnetic stripe-based solutions that are widely used in first world economies and require that all transactions, including retail sales, the dispensing of cash, the loading of value to smart cards and the authorization of credit transactions, be performed only at self-service terminals, or SSTs, ATMs or POS devices that operate online. Thus, online systems cannot be used to provide financial or banking services to the millions of people, such as those in developing countries, that live in geographical areas that have little or no infrastructure. Most smart card systems

therefore, such as Europay, MasterCard and VISA, or EMV, also operate online. We believe that this reliance on online communication has limited the exploitation of smart card technology, has resulted in high system implementation and operational costs and has not addressed many of the needs of the world s unbanked population.

Our offline loading feature has been designed to solve these problems associated with reliance on limited infrastructures and allows value to be distributed through existing infrastructures such as the postal service, fixed line telephones, cellular phones, verbal communication and newspapers. Our solution is a unique ten-digit signature code that the UEPS back-end system generates to enable specific amounts to be loaded to specific smart cards. When a ten-digit signature code is presented at any offline POS device to the smart card for which it was created, the code will, after validation, allow the smart card to credit one or a number of its internal wallets in the appropriate amount.

The offline loading function can be used to transfer funds remotely for payments such as wages, pensions, welfare grants, refunds and third party transfers. When a number of ten-digit signature codes are created for a specific smart card, each ten-digit signature code can then only be applied to that smart card once. Ten-digit signature codes can be presented to a smart card in a different order from the one in which the codes were created but can be effected only by that particular smart card.

Biometric Identification. The magnetic stripe credit and debit card systems available today use a written signature or a personal identification number, or PIN, in an effort to verify the customer s identity minimize the repudiation of transactions. However, PINs can be compromised, magnetic stripes can be cloned and if a card is stolen together with its PIN number, the card can be used to transact until it is reported stolen or its offline limits are reached. The PIN and card can also be used to gain access to back-end account information to defraud further the genuine card holder. Therefore, positive offline card holder verification is critical to ensure that a payment system does not effect fraudulent transactions. At the same time, the system must ensure that the genuine card holder s transactions are not rejected.

As an alternative form of customer identification, the UEPS supports biometrics in the form of fingerprint recognition. Biometric scanners are used to record a customer s fingerprint images. The fingerprint templates that result are stored in the holder s smart card and used for identification whenever the smart card is used.

Before a smart card is issued, the following fingerprint recordation process occurs:

- All ten fingers are captured, with three fingerprint images captured per finger.
- The three fingerprint images for each finger are consolidated and filtered to create the best image for that finger. This results in ten high-quality fingerprint images.
- The ten fingerprint images are used to generate fingerprint templates. A fingerprint template is a unique geometric representation of one fingerprint.
- The card holder is verified against these templates using the highest fingerprint matching threshold to ensure the best recordation process. This process assists to eliminate the false rejection of genuine card holders due to initial bad fingerprint template recordation.
- The fingerprint templates are signed by an issuing UEPS smart card and stored on the card holder s smart card.

When a transaction is performed, the card holder s fingerprints are verified against those stored on the smart card. The verification process occurs in a secure session between the smart card and the fingerprint scanner. During the verification phase, a moderate matching threshold is used to compensate for the changes in the card holder s fingerprint conditions.

Our biometric identification feature is designed to protect our card holders against fraud, helps eliminate transaction repudiation and reduces the complexity associated with hot card management systems and hot line centers, as well as the cost of the systems that are utilized to deal with stolen and lost cards.

Automatic Credit. The distribution of social welfare benefits, unemployment insurance, food parcels or vouchers and medical supplies is personnel intensive. Furthermore, beneficiaries must present themselves regularly at designated distribution locations in order to receive their benefits. These requirements create a number of operational and logistical problems, which increase the direct or indirect costs for system owners, operators and members, including:

- The costs of transporting beneficiaries and payment personnel to and from distribution points;
- The time beneficiaries must spend waiting in line at distribution points rather than working or engaging in other activities;
- The need to provide adequate staff, water, toilets, medical emergency services, shelters and security at distribution points;

- The need to provide personnel to deal with beneficiary communications and inquiries; and
- The need to create itineraries and schedules for payment delivery personnel, as well as to establish distribution centers and purchase vehicles to travel to distribution points.

Thus, governments incur significant costs in distributing social welfare payments at fixed or movable locations, and banking institutions must spend large sums to provide branches and ATMs where their customers can obtain cash. Many of these costs cannot be passed onto the client. We have developed the capacity in the UEPS to facilitate the distribution of cash at retail merchants in a manner that eliminates or reduces the need for social welfare beneficiaries and customers to travel to a specific ATM location, reduces merchants costs of depositing excess cash and that enables banks to reduce their costs associated with providing, maintaining and servicing brick and mortar infrastructures.

We developed our automatic credit feature to allow our smart card holders to receive regular, fixed amount payments at POS devices that may not have the capability to perform online functions. The participants in an automatic credit transaction are the automatic credit initiator, the smart card holder and the merchant. The automatic credit initiator is the issuer which creates an automatic credit instruction for a particular wallet of a specific card holder. The smart card holder is the beneficiary of the automatic credit instruction which has been approved by the initiator. The merchant is any retailer which participates in the UEPS system and has a POS device for a card holder to activate automatic credit instructions.

Card holders go to designated points to register for an automatic credit instruction. While at the POS device, the credit initiator submits an application for an automatic credit instruction to the back-end system. The application can occur offline or online. Once the back-end system has validated the beneficiary s information, it creates an automatic credit instruction signature which is sent back to the POS device and is then recorded on the smart card. On the day that the card holder is due to receive a payment, the card holder inserts his smart card into any POS device. In the event that the automatic credit instruction is due and valid, the smart card of the card holder is automatically loaded.

Interest on Card. Unbanked people transact mainly with cash. One of the most fundamental disadvantages of cash is that it cannot generate interest income for the holder and that its value depreciates with inflation. The UEPS was designed, in essence, to be an alternative to a formal banking account that allows a smart card holder to earn interest on the value contained in his various wallets. The ability to earn interest provides an incentive for people to maintain balances on their smart cards rather than convert the full balances to cash or to unload them to a traditional banking account where they would not earn any interest.

There are numerous possible types of interest calculations, including simple, compound, continuous, minimum balance, average balance, daily and monthly interest. The UEPS uses the compound interest methodology, calculated daily on the previous day s closing balance. In order to calculate interest correctly, the client smart card requires a host date certificate, or HDC. This date originates from the back-end system, and is updated on the merchant smart card when it settles its transactions. The merchant smart card in turn passes the HDC to the card holder s smart card, which enables the client smart card to calculate the interest for any wallet that bears interest. The system is designed to ensure that the client smart card only calculates the interest using the latest HDC, and not any date given to it from an unsettled or inactive merchant smart card. Once interest is added to an interest-bearing wallet, a notification record is written to the card holder s smart card history file and forwarded to the merchant smart card for settlement. This record informs the back-end system of the interest amount credited.

UEPS Morphing. The UEPS is proprietary. It is designed for a specific market that requires specific features and as such is not compliant or compatible with other smart card systems. If it were compatible with other systems, the usefulness of the UEPS would be as limited as these other systems and could not provide a solution for the unbanked populations of the world. However, we have designed the UEPS in such a way so that it can inter-operate with other standard payment systems such as EMV, one of the more widely-used standards in the banking sector. In the future, smart card holders may wish to use their smart cards in environments that are currently enabled for other smart card-based payment systems. The UEPS morphing feature allows our smart cards to transact at EMV POS devices as if our smart cards were in fact EMV smart cards. Our card holders can thus transact at EMV POS devices but the functionality provided at these POS devices is limited to that offered by the EMV system. Our smart cards, when required, can morph into the standards supported by the POS devices thus minimizing the cost of deploying another

POS infrastructure.

Our UEPS morphing feature is not merely a collection of multiple applications grouped together into a single smart card. This feature also enables inter-operability between these applications. The EMV standard is mainly an online application that requires offline card authentication, online host authorization and online card issuer authentication. The EMV payment application is invoked by the POS device using the application selection methodology. The UEPS smart card can recognize the type of environment in which it is used through the command structure passed to it from the ATM, SST, POS device or any other smart card reader conducting the transaction. Once the smart card has sensed the system in use, it immediately morphs this application and behaves as such for the duration of the transaction. The morphing feature is not limited to EMV, but can also be used with CEPS, Visa Horizon and Mondex, among other systems. It places the UEPS card holder in a unique position to possess a single smart card, and use it at any POS device, ATM or SST of his choice, without having to have different smart cards for every payment application.

Automatic Debit. Currently, payees experience various administrative problems and other challenges in collecting payments due to them through the formal banking system for insurance premiums, micro-loan payments and governmental statutory deductions for items such as unemployment insurance. In addition, collectors suffer payment losses as a result of insufficient funds, closed accounts, or charge back transactions, and may incur significant personnel costs for employees to attempt to collect from non-payors. Payees may find that their accounts are incorrectly debited, unauthorized debits are made or they pay high fees for debit orders which are not processed.

For unbanked people, their problems are often even greater since their only means of payment is cash. To pay a premium, they have to present themselves at the office of the financial service provider and pay their premium in cash. These offices are typically in urban areas and therefore unbanked people have to pay for transportation in order to make their monthly payments. Carrying substantial amounts of cash over long distances involves risks of theft and loss.

We created the automatic debit feature to allow a smart card to reduce the balance in any of its active wallets on a specific date and for a predetermined amount. This function can take place in an offline environment at any POS device. The automatic debit feature reduces the risks associated with collection of insurance premiums and other regularly scheduled payments by ensuring that any funds loaded to the smart card are first used to service the automatic debit before being transferred for the card holder s general use.

The participants in an automatic debit transaction are the automatic debit initiator, the merchant and the smart card holder. The automatic debit initiator is the issuer which will create an automatic debit instruction for a particular wallet of a specific smart card holder. The merchant is any retailer which is a participant in the system and has a POS device for a card holder to activate automatic debit instructions. The card holder is the person who must pay the premium or other payment.

Card holders register for automatic debit instruction at the offices of the automatic debit initiator. While at the POS device, they submit an application for an automatic debit instruction to the back-end system. This can occur offline or online. Once the back-end system has validated the beneficiary s information, it creates an automatic debit instruction signature which is sent back to the POS device and is then recorded on the smart card. On the day that the card holder is due to pay a premium or other payment, the card holder inserts his smart card into any POS device. In the event that the automatic debit instruction is due, the smart card of the card holder is automatically debited.

Multiple Streams Audit Trails for Offline UEPS Transactions. The UEPS, as an offline system, must ensure that all transactions effected offline are settled, at some point in time, by the back-end system. Settlement is critical to guarantee that no funds can be lost by card holders even when a POS device, its paper audit trail or its merchant smart card is lost, stolen or destroyed. Importantly, smart card transactions, including automatic credits, automatic debits, interest accruals, agent transfers, cash downloads and purchases all have a financial effect on individual smart card balances and must therefore be settled in order to preserve system integrity. The UEPS multiple streams audit trail functionality is designed to ensure that the replacement smart card contains the correct amount of funds when a lost, stolen or defective card is replaced.

The UEPS provides the ability to activate multiple streams audit trails through POS device profile downloading. Multiple streams audit trails are distributed through the active smart card base and are completely transparent to all card holders. Multiple streams audit trails can only be implemented on smart cards which have an adequate amount of EEPROM memory as the size of the transaction file created on smart cards will at least double. The multiple streams audit trails functionality is especially useful in environments where either the POS device is offline or may be damaged or destroyed due to the harsh environmental conditions in which it operates or where there is a perceived risk that the POS device may be stolen.

When a client smart card is inserted into any POS device to perform one or more transactions, including a sale, load, unload, automatic credit, automatic debit or interest accrual transaction, the current transaction is written to both

the client and the merchant smart cards. The previous transaction performed by the client smart card at another POS device is also written to the currently transacting merchant smart card transaction file as a piggy back record. The previous transaction or transaction group written to the merchant smart card from another client is also written to the client smart card of the currently transacting client.

This process ensures that each transaction or transaction group effected on a client smart card is distributed directly to a second merchant smart card and indirectly to a third merchant smart card. The third transfer occurs by writing the transaction or transaction group to another client smart card which in turn transfers the same to a different merchant smart card. The number of different audit trails streams can be selected through the POS device or merchant profiles.

Upon settlement of the merchant smart card, the transactions which were performed at other merchants will therefore also be settled. Each merchant smart card becomes the carrier for transactions that have occurred at other merchants. All client smart cards become the multiple streams that facilitate the movement of transaction data among unrelated merchant smart cards. This process occurs in an offline environment.

In the event of the loss or destruction of any POS device or its associated merchant smart card or paper audit trail, all transactions that have been piggy backed can be recovered through the settlement of other merchant smart cards. The speed at which these transactions can be recovered will depend on how frequently the client smart cards that are used to piggy back transactions have transacted at other UEPS merchants. The multiple streams audit trails functionality provides complete and independent audit trails that help prevent fraud by single or colluding parties.

Transparent and Automatic Recovery for Offline UEPS Transactions. The UEPS, as an offline system, must ensure that all transactions effected offline complete successfully or that, in the event of a failure, the transaction in progress can be restarted without any loss being incurred by either the client or merchant concerned. Failure of the POS device or the premature removal of either of the smart cards involved during a transaction may lead to the client smart card being debited without the corresponding credit being reflected on the merchant smart card. Although the premature removal of either of the smart cards can be prevented by introducing motorized smart card readers, the cost involved is prohibitive and the solution does not address other possible failures due to POS device hardware problems or power failures, which are common in areas with unreliable power infrastructures.

The UEPS is designed to recover failed transactions through its transparent and automatic recovery feature. This feature is activated during the session key establishment phase that occurs whenever two smart cards transact. During the session key establishment phase, each smart card generates an eight-byte natural random number and triple-DES encrypts it with its generic UEPS key pair. These two encrypted blocks are then exchanged by the two smart cards, and once decrypted, used by each smart card to generate a random DES key pair. This new key pair is used to exchange further information between the smart cards until the transaction is completed.

During the next phase, each smart card passes to the other its smart card unique serial number and its current transaction counter. At this stage, the client smart card is now able to determine if the last transaction written to its transaction file was indeed also effected on the merchant smart card. If not, the client smart card simply unrolls its last transaction thus restoring the correct data image as it was prior to the transaction. This feature can also be used whenever a POS device is disabled for whatever reason. In this instance, the two smart cards can simply be inserted into any other working POS device and the two smart cards will automatically re-synchronize themselves. Further transaction processing can then resume normally. As a result of this feature, transactions such as transaction cancellation and reversals can be performed offline in a secure manner.

Mechanics of Loading, Spending and Settlement

The following describes how card holders can load value onto their smart cards and spend the value they receive. It also describes how merchants settle transactions with our back-end system.

Loading. All card holders that receive social welfare grants or whose employers participate in our system can load their smart cards at any POS device located in merchant stores. Card holders can load their smart cards in several different ways. If the card holder s electronic value was created through the ten-digit signature code, then the card holder has three options. He can effect an online auto load, in which case the POS device connects in real time to the back-end system, which then forwards any available ten-digit signature codes present in the account of the card holder. These codes will be loaded to the smart card automatically. If the communications network is erratic or unreliable, ten-digit signature codes can be downloaded to the POS device of a nearby participating merchant where and when the network is operational. The card holder can then perform an offline auto load whereby any ten-digit signature codes present in the POS device will be loaded to his smart card. If a network connection is not available, the card holder can key in his ten-digit signature code and amount to be loaded. In all scenarios the smart card will be

credited only if the ten-digit signature code is decrypted successfully by the smart card. If the card holder s smart card is initialized with one or a number of automatic credit instructions, the smart card will credit itself as we describe under Automatic Credit feature.

Spending. Once value has been loaded to a smart card, card holders may purchase goods or services, make cash withdrawals, initiate money transfers, request automatic loans, effect third party payments and invoke automatic credits and debit orders, all offline at any participating merchant store. To perform a transaction, the card holder inserts his smart card into the top smart card reader of the POS device and selects the appropriate function. Biometric fingerprint identification is required for most functions to protect card holders against the unintended or fraudulent usage of their funds. A printed receipt displays the details of the transaction performed and includes other system audit trail information.

Settlement. As spending on a UEPS smart card occurs offline, the settlement of the merchant transactions with the back-end system needs to take place within the two day window settlement period provided for in the contract, or as and when the merchant smart card becomes full. Settlement can be performed online or offline. Merchants who have access to a network infrastructure can use the settlement option on their POS devices to connect to the back-end system and settle their merchant smart cards online. During the settlement process, merchants choose whether to have the funds settled deposited to a traditional bank account or transferred to a client smart card.

Once the merchant selects the settlement option, the transactions are stripped off the merchant smart card, and the accumulated transaction values, less the transaction fees which the merchant is contractually required to pay to us, are paid to the merchant. Payment occurs either through the country s traditional banking clearing system, by check or is credited to the merchant s client smart card for immediate or future use. The last option is extremely beneficial for rural merchants who purchase their goods from larger wholesalers. Their funds are, upon settlement, immediately available. Therefore, they can purchase goods using their client smart card and/or withdraw cash at other participating merchants. Merchants who do not have access to a network infrastructure can insert their merchant smart card into any POS device that has online connectivity and perform the settlement process. Many merchants can share any POS device.

If a merchant does not have access to a communication network, the merchant can use our milking function with a milking smart card. This smart card has greater functionality than a regular smart card and therefore requires a large memory chip for storing multiple transactions, hot card files, a freshness certificate, and any other variables, including fees and/or interest rates that need to be updated on merchant smart cards which operate in deep rural areas. The milking smart card is inserted in the bottom smart card reader of a POS device and the merchant inserts the merchant smart cards to be milked into the top smart card reader. During this settlement process, the transactions are stripped from the transaction history file of the merchant smart card and at the same time, the new hot card file, freshness certificate, fee structure, interest rates and any other parameter that requires modification are updated. The milking smart card is then physically handed over to the central office in order to update the back-end system. At the time of settlement, all transactions are stripped from the merchant smart card, aggregated and paid into the nominated bank account of the merchant. Merchants can select their client smart card as their nominated account, in which case the amount to be paid is added to the merchant s client smart card.

We have designed and developed a dual functionality smart card called the Net1 Combi-Card for use in rural environments and for very small merchant stores or hawkers. Hawkers are typically small merchants that sell food or merchandise from a stand on the side of road or on a pavement. This smart card is initialized with both merchant and client functionality. While trading, the merchant section of the smart card is used for transaction storage which once settled will allow the merchant to use the same smart card to perform purchases or any other financial function.

Our UEPS Products

The following table summarizes each of our smart card to smart card, or S2S, products, including:

- the market introduction date;
- the key features of the product;
- the features of our UEPS technology which each product uses;
- the types of fees we charge or currently plan to charge for the product; and
- the target markets for the product:

Product	Year of Market Introduction	Features	Types of Fees	Target Markets
S2S Pension and Welfare	• 2000-2004	• Ten-Digit Signature Codes Offline and Online Loading • Automatic Credit • Multiple Audit Trail • Mutual Authentication • Transparent and Automatic Recovery • Biometric Identification	• Loading Fee per Beneficiary • Sales of Smart cards • Registration and Enrollment	• Government • Social Welfare Grant Beneficiaries
S2S Wage Payment	• 2005	• Ten-Digit Signature Codes Offline and Online Loading • Multiple Wallets • Restricted Wallets • Multiple Audit Trails • Mutual Authentication • Transparent and Automatic Recovery • Biometric Identification • Interest Calculations	• Wage Loading Fee per Employee per Month • Equipment Sales per Payroll Clerk plus POS Terminals for the Payment of Wages in the Field or Factory • Sales of Smart cards • Mass Registration and Enrollment per Employee if Performed by us • Monthly Smart Card Account Fee per Employee per Month	• Employers • Employees
S2S Cash Advance	• 2006	• Ten-Digit Signature Codes Offline and Online Loading • Multiple Wallets • Restricted Wallets • Multiple Audit Trails • Mutual Authentication • Transparent and Automatic Recovery • Biometric Identification • Automatic credit scoring • Automatic debit and credit • Interest Calculations	• Interest earned if we assume the credit risk • Loading fee per cash advance • Debit order fee • Sales of Smart cards • Mass Registration and Enrollment per Employee if Performed by us	• Employers • Employees
S2S Loans to Card	• 2006	• Ten-Digit Signature Codes Offline and Online Loading • Multiple Wallets • Restricted Wallets • Multiple Audit Trails • Mutual Authentication • Transparent and Automatic Recovery • Biometric Identification • Automatic credit scoring	• Interest earned if we assume the credit risk • Loading fee per cash advance • Debit order fee • Sales of Smart cards • Mass Registration and Enrollment per Employee if Performed by us	• Financial institutions • Employees

		• Automatic debit and credit • Interest Calculations • Electronic card audit trail of all active loans • Enforcement of minimum disposable income rules		

Product	Year of Market Introduction	Features	Types of Fees	Target Markets
S2S Medical Management, Patient Monitoring and Distribution	• 2005	• Multiple Wallets • Restricted Wallets • Multiple Audit Trails • Mutual Authentication • Transparent and Automatic Recovery • Biometric Identification	• Technology Processing Fee per Smart Card per Month (Volume Based) • UEPS Software Fee (Volume Based) • Database Capturing Module per Patient • Patient License Fee per Hospital/Clinic/Health Care Facility • Equipment Sales for Hospital/Clinic and Health Care Facility • Sales of Smart cards	• Non-Governmental Organizations • Government Paid Contractors • Governments
S2S Retail and Wholesale	• 2004	• Ten-Digit Signature Codes Offline and Online Loading • Automatic Credit • Multiple Wallets • Restricted Wallets • Multiple Audit Trails • Mutual Authentication • Transparent and Automatic Recovery • Biometric Identification • Interest Calculations • Settlement Offline and Online	• Merchant Transaction Fee • Cash Withdrawal Fee from UEPS Card Holders Excluding Social Grant Recipients • Hardware Equipment Sales or Rentals • Smart Card Sales • Installation & Training Fee • Reports and Banking Fees • Monthly Card Account Fee per Retailer per Month	• Retailers • Wholesale Retailers • UEPS Client Card Holders
S2S Insurance System	• 2004	• Multiple Audit Trails • Mutual Authentication • Transparent and Automatic Recovery • Biometric Identification • Settlement Offline and Online	• Insurance Merchant Transaction Fee • Debit Order Collection Fee • Hardware Equipment Sales or Rentals • Smart card Sales • Installation and Training Fee • Reports and Banking Fees	• Insurance Underwriter/Broker (External Insurance Merchants)

The following describes in more detail how our S2S products work and the benefits of each product.

S2S Pension and Welfare

S2S Pension and Welfare provides a secure and affordable transacting channel between social welfare grant beneficiaries, governmental agencies and formal businesses. Through this product, we distribute social welfare

benefits to the unbanked and under-banked populations, and allow the recipients of these benefits to transact with formal businesses.

How it works. We enroll social welfare grant beneficiaries by issuing them a UEPS smart card that digitally stores their biometric fingerprint templates on the smart card, enabling them to access their social welfare grants securely at any time or place. The smart card, with its pre-printed and unique serial number, or USN, is issued to the beneficiary on site. Optical fingerprint sensor technology identifies and verifies beneficiaries. The fingerprint reader is programmed to create a random cryptographic session between itself and an inserted smart card, thereby limiting the possibility of fraudulent storage and replay of digital templates.

The smart card provides the holder with access to all of the UEPS functionality, which includes the ability to have the smart card funded with wage, pension or welfare payments, make retail purchases, enjoy the convenience of pre-paid facilities and qualify for a range of affordable financial services, including insurance and short-term loans. The smart card also offers the card holder the ability to make debit order payments to a variety of third parties, including utility companies, schools and retail merchants, with which the holder maintains an account. The card holder can also use the smart card as a savings account. Depending on a country s specific requirements, holders load their smart card using one of two methods ten-digit signature code creation or automatic credit. We describe both of these methods under Our Technology UEPS Smart Card Functionality Offline Loading and Automatic Credit.

When the ten-digit signature code method is used, the government agency submits to us a simple payroll file containing the beneficiary s identity number and the value of the grant. We then process this file and, using the identification number of each beneficiary, create a ten-digit signature code. The ten-digit signature code can only be loaded on to the smart card for which it was created. These ten-digit signature codes can be distributed to the memory of POS devices or other compatible devices, including fixed or mobile ATM dispensers or remote personal computers, by accessing a communication network such as satellite, X.25, TCP/IP or GPRS-GSM. Thereafter, the beneficiary can load the smart card offline. If a GPRS GSM communication network is available, the beneficiary can load the smart card online.

The beneficiary simply inserts a smart card into the POS device and is prompted to present his fingerprint. If the fingerprint matches the one stored on the smart card, the smart card is loaded with the ten-digit signature code created for that particular smart card. The POS device then prints a receipt that outlines the amount of the grant paid to the beneficiary.

The automatic credit feature allows a smart card holder to receive regular, fixed-amount payments such as welfare grants or other benefits, food parcels, meal vouchers and/or medical supplies at POS devices that operate offline. Automatic credit instructions are recorded on the smart card at the time they are granted by the issuer. Each automatic credit instruction recorded embodies a number of parameters such as the amount and the wallet to be credited, the frequency at which the credit should occur and the commencement and expiration date of the instruction.

When the beneficiary inserts a smart card into a POS device or any other compatible device, the automatic credit feature will be automatically invoked. During this process, each automatic credit instruction previously recorded on the smart card will be reviewed. If all related parameters such as timing, commencement and expiration date are all correct the smart card is credited with the funds due. When this happens, the transaction is recorded immediately on the merchant smart card present in the POS device at the time that the beneficiary s smart card is credited. Since the electronic funds have been created offline, automatic credit transactions must be forwarded to the back-end system through a merchant settlement or through our multiple audit trail facility. We are able to claim the actual funds loaded to beneficiaries smart cards from the government agency at the end of each business day because the back-end system is informed of all of the electronic values created.

Benefits. Our S2S Pension and Welfare system provides numerous benefits to governments agencies and beneficiaries. The system offers provincial governments a reliable service at a reasonable price. For beneficiaries, our smart card offers convenience, security, affordability and flexibility. They can avoid long waiting lines at payment locations and do not have to get to payment locations on scheduled payment dates to receive cash. They do not lose money if they lose their smart cards, since a lost smart card is replaceable and the biometric fingerprint identification technology helps prevent fraud. Their personal security risks are reduced since they do not have to safeguard their cash. Beneficiaries have access to affordable financial services, can save and earn interest on their smart cards and can perform money transfers to friends and relatives living in other provinces. Finally, beneficiaries pay no transaction charges to load their smart cards, perform balance inquiries, make purchases or downloads or effect monthly debit orders. For us, the system allows us to reduce our operating costs by reducing the amount of cash we have to transport.

S2S Wage Payment

S2S Wage Payment allows an employer to pay employee wages electronically, either online or offline, by transferring the precise amount of the wage payment directly onto a smart card, thus eliminating the need for the employer to store and handle cash at the workplace. We originally designed this product for unbanked and under-banked workforces and their employers. However, employers of employees who often have bank accounts have expressed interest in this product as well, which we attribute to its affordability, convenience and security.

How it works. Employees of participating employers receive smart cards which we issue to them. We download a ten-digit signature code for each employee wage payment to a POS device, and the employer takes the POS device to the pay site on payday. The employee inserts his smart card into the POS device which then searches for any ten-digit signature codes created for that particular smart card. Once the POS device locates and decrypts the ten-digit signature code, it immediately loads the smart card with the wage payment. The POS device prints a receipt which acts as a pay stub by including the amount of the wage paid and any deductions made. The receipt also indicates the balance of the savings wallet, if available. The process takes up to six seconds from insertion of the smart card to completion of printing. Personal identification through finger print authentication is not necessary to perform a load as the ten-digit signature code is uniquely linked to the USN number of the employee s smart card.

Benefits. S2S Wage Payment provides numerous benefits to employers and to employees. For employers, the system helps to increase productivity in the work environment and reduce administration and labor costs associated with the management, transportation, delivery and general handling of cash. Electronic payment requires less time than manual distribution of cash pay packets, thereby reducing the amount of employee downtime. Employers in rural and semi-rural areas no longer need to incur the inconvenience and expense of transporting their employees to urban areas to enable them to receive their wages from ATM s nor to have to advance funds whenever these ATM s run out of cash. In addition, the system is configurable for each employer so that the database can be split up into departmental or company sub-databases, if required.

Further, employers of unbanked and under-banked employees are frequently put into a position of having to provide savings, loans, burial insurance and other financial services to their workers. With S2S wage payment, the employee can opt to have a portion of his wage loaded directly to a separate savings wallet on the smart card. Interest is calculated on the current daily balance and paid monthly to the card holder. The card holder can also qualify for an affordable loan, provided by us or another participating service provider, which is loaded onto his smart card. The smart card informs the back-end system of the monthly loan repayment which is applied against the wage after loading the amount due to the smart card. Finally, instead of the employer having to negotiate the most cost effective burial insurance for his employees, he can take advantage of the insurance we negotiate with selected insurance companies on behalf of many employers. The issuance of the insurance policy is recorded in the chip of the smart card. For employees, S2S wage payment offers all of the benefits described above under S2S Pension and Welfare. Additional benefits include fees for cash withdrawals that are typically lower than bank charges for the same transaction.

S2S Cash Advance

The S2S Cash Advance product will provide an issuer with the facility to offer small monthly cash advances to UEPS cardholders at UEPS POS terminals installed at participating merchants, bank branches and the offices of micro-financiers.

The product allows the cardholder to receive a cash advance, calculated offline by the client's card, taking into account the monthly salary or wage income previously received by the card as well as any current deductions in respect of short or medium term loans. For example, when the next wage is paid on the card, the full amount of the previously granted cash advance plus associated finance charges will be automatically deducted and remitted to the financier. The card holder will then be in a position to qualify for a new cash advance as and when required.

How it works. When a client presents his/her client card in the top slot of the POS device and the client selects the Cash Advance function on the POS device, the POS device will interrogate the client card for a previous Cash Advance that has not been repaid via debit order instructions. If a Cash Advance exists, this transaction will be denied. The POS device will prompt the client to select one of the Cash Advance options. The POS screen will display the Cash Advance option as well as the Cash Advance amount calculated. Once a Cash Advance has been granted and the client has been successfully biometrically verified, the client card will credit itself with the amount of the Cash Advance.

Benefits. S2S Cash Advance has many benefits for card holders, merchants and financiers. For card holders, the system provides a cost effective and flexible method to apply for a Cash Advance at any registered merchant, bank branch or micro-financier that participates in the system. The system gives a card holder convenient access to credit as the credit check is performed by the client card itself in order to grant the Cash Advance, at an affordable low interest rate charged. Merchants benefit through the creation of a new revenue stream as they will be paid a fee for each Cash Advance loaded. Finally, the system benefits financiers as it provides a cost effective way of granting affordable Cash Advances without the cost of labor, stationary, infrastructure and administration.

S2S Loans to a Card

The S2S Loans to a Card was designed for financiers to be able to participate in our SmartSwitch systems and utilize the UEPS technology to minimize the cash amount being paid out to their clients in respect of loans. Loans which are being made to cardholders can be loaded electronically on to their smart cards instead of dispensing cash.

How it works. In order to participate in the system, the financiers will have to be registered onto the SmartSwitch system. A legal contract is completed between SmartSwitch and the Financier/ Merchant stating the specific hardware equipment requirements. Arrangements are made between SmartSwitch and the Financier/ Merchant for installation, implementation and training of the product.

In order to perform offline loads to a client card, the first step will be to request the amount of electronic funds required for the day s/week s transfers to cards. The amount required plus a fee levied by SmartSwitch must be paid into a nominated bank account of SmartSwitch as stipulated in the merchant contract. If the fee is not included, the SmartSwitch system will automatically deduct the fee from the total funds requested. The merchant / financier will advise SmartSwitch as soon as funds have been transferred into the nominated bank account in the contract. The value will be credited to the financier / merchant s instant bank account, or IBA, held on the back-end system and linked to the Merchant/Agent Card Reference Number. Using the POS device, the merchant will select the option to perform a funds load transaction for the value required. The POS will go online to the system host, access the funds available in the merchant IBA and load the merchant s agent transfer card accordingly. When a loan is granted, the client card is inserted into the top reader of the POS device and the amount of the loan is transferred electronically from the merchant/agent card to the client card. A slip is printed verifying the amount of the loan loaded. The client can then perform a limited cash withdrawal if required and utilize the balance at merchant stores for spending and/or cash withdrawals. A sales transaction for the monthly repayment of the loan can be performed immediately, limiting the risks and costs involved in finding the client for repayment purposes or a third party deduction file will be forwarded to SmartSwitch. At the end of each business day, merchants will be required to settle their merchant agent cards to the SmartSwitch system host for reporting purposes.

Benefits. The benefits of S2S Loans to a Card are multiple. The system reduces cash held at a lending branch as there is no need to dispense cash to the client in respect of a loan. The loan value is electronically loaded to the smart card. The risks associated with fraud and theft is minimized as there is no need to hold large amounts of cash on the premises. Instead of collecting cash, the monthly loan repayment can be performed electronically by performing a sales transaction using the same POS device or third party deduction. The result is a reduction in overall operating costs as security and insurance costs are reduced. The system also prevents the granting of fraudulent loans as biometric fingerprint verification is required from both the cardholder and the agent merchant card managing the loan. Finally, the merchant has easy access to a full audit trail of all electronic loans loaded from the merchant card to the cardholder s card and detailed management reports are made available to the merchant on a daily and monthly basis.

S2S Medical Management

Our S2S Medical Management product applies the UEPS technology in a non-financial environment to facilitate the management, distribution and control of the anti-retroviral, or ARV, drugs used to combat HIV/AIDS. The system is designed to operate in the deepest rural areas where no meaningful infrastructure exists. It is also designed to form a basis for the implementation of other drug distribution programs.

Governments and charitable organizations face many challenges in the distribution and control of ARV drugs. Patients who do not strictly adhere to the required drug regimen for the rest of their lives face the risk of drug resistance, which can lead to death. The toxicity of ARV drugs requires effective patient monitoring. Data needs to be collected to evaluate the effectiveness of drugs available for treatment.

How it works. We issue smart cards to participating hospitals, dispensaries and doctors and to their AIDS/HIV patients. The smart cards use biometric fingerprint identification technology and act as portable electronic medical record books that allow patients to be serviced anywhere without relying on centralized systems and communications networks. The smart cards carry all patient-related information, including personal details, drug regimens, prescriptions, visitation history, doctor s details, dispensary information and other data. This data allows us to populate and update databases that track each patient s progress, each doctor s performance, each and every prescription dispensed and each dispensary s drug inventory levels. The system monitors patient activities, and is designed to ensure the integrity of data, reduce fraud, manage drug inventories and, control drug delivery, ensure patient anonymity and privacy, and distribute payment for goods and services. Each day, all registration information, changes to patient information, and information regarding drug dispensation is encrypted and communicated to our back-end system for batch processing. Once validated this information is forwarded directly to a confidential server managed by the government and/or funding organizations.

Benefits. S2S Medical Management offers many benefits to government organizations, medical professionals and health care workers, and patients. For government organizations, the system helps save money by improving the efficiency of ARV drug distribution and by reducing the potential for fraud and falsification of data. For medical professionals and health care workers, the system facilitates the real time but offline registration of patients and the storage of crucial patient information, such as the patient s last visit date, changes in information such as height and weight and the most recent prescription. For patients, the portability of the electronic medical record allows them to be treated anywhere, without relying on centralized systems and communications networks. The system, which is provided free of charge to the patient, is designed to ensure patient privacy. Finally, our technology preserves the patient s information, even if the smart card is lost.

S2S Retail and Wholesale

Our S2S Retail and Wholesale product enables retailers, wholesalers and financial service providers to effect commercial transactions with one another and with unbanked and under-banked customers. Many merchants who service the unbanked and under-banked operate in underdeveloped areas where traditional financial institutions and their products are unavailable or limited due to the lack of communication infrastructures. In addition, these merchants do not meet the selection criteria imposed by financial service providers, including banks and credit card companies, either for financial reasons or because they cannot meet or adhere to the rules and regulations these formal institutions demand. The system permits participants, which include merchants, wholesalers and financial service providers to effect payments for goods and services, and to dispense cash from one smart card to another in a secure offline manner. The system is designed to eliminate unauthorized use by ensuring that all transactions are biometrically approved by the card holders. The system guarantees integrity by providing an audit trail for each transaction that is stored on both the customer and merchant smart cards.

How it works. The participants in this system are merchants whom we enroll and consumers who are smart card holders. When we enroll a merchant, we issue a smart card to the merchant that contains its profile as well as the store s merchant reference number and install an appropriate POS device that takes into account the type of power and communications infrastructure available at the merchant s location. The POS device is either battery-operated or uses a municipal power supply. All our POS devices can use GSM/GPRS, TCP/IP, X.25 or satellite networks to perform loading and settlement functions. The smart card is inserted in the bottom smart card reader of the POS device to perform on-line transactions with customers. We sign a contract with each merchant that is tailored to the needs of each merchant, reflecting the number of stores to be serviced and the specific hardware we agree to install. We provide each merchant with installation, system implementation and training. We also provide merchants with our marketing material for display at their locations so that their customers know that the merchant offers our services. The transactions stored on merchant smart cards cannot be overwritten until they have been settled by using our offline milking facility or connecting online to the back-end system.

Benefits. S2S Retail and Wholesale provides numerous benefits to merchants and to customers. A growing smart card base offers merchants a larger number of customers who can shop in their stores. The system also provides them with the opportunity to realize new income streams from the fees they collect by providing at their locations our broad range of financial services and products, including cash downloads, money transfers, loans and burial insurance. Finally, their security risks and expenses associated with handling cash can be significantly reduced, including banking charges and communications costs. The benefits of the system for customers are a combination of the ones we describe above under S2S Pension and Welfare and S2S Wage Payment.

S2S Insurance

Our S2S Insurance intermediary product enables unbanked and under-banked consumers to obtain affordable and reliable burial insurance policies. In South Africa, cultural reasons make burial insurance important to many people. Our system enables insurance companies to access this customer base. The insurance industry is subject to various laws and regulations which are designed to protect policyholders and our system ensures compliance with these laws and regulations by utilizing the key features of the UEPS technology.

How it works. In order to participate in the system, card holders and insurance brokers must be enrolled in our system. The broker enrollment procedure is similar to the procedure we use for merchants. The insurance broker s merchant smart card is created centrally and loaded with the broker s burial insurance product options. Individual brokers receive smart cards which digitally store their biometric fingerprint templates on the smart card. After completion of the enrollment process, we issue an insurance merchant smart card to the insurance broker. We provide the insurance broker with installation, implementation and training.

When an applicant applies for an insurance policy, the insurance broker explains relevant information, including the different policy options, waiting options and the 30-day cooling off period. The 30-day cooling off period allows the policy holder who has decided to buy a policy issued by another insurance company to change is mind and to keep the original policy instead. The system informs all parties involved, including the brokers for the previous insurer and the new insurer that the client is in a 30-day cooling off period. This makes the insurance broker of the previous insurer aware of the client s intention, and allows the insurance broker to contact the client in an effort to keep the client.

When a broker sells a policy to a client, the first check performed by the smart card is to ascertain if the client has already signed up for a similar product, which may be accomplished offline. If not, the client accepts the new policy by presenting his fingerprint for verification by the smart card. The broker also presents his fingerprint to prove that he sold the policy and thereby allow him to receive his sales commission. The system then writes the policy number and details, including the amount of the premium, to the card holder s smart card. This reduces the risk of future disputes regarding the policy. When an insured individual dies, the beneficiary presents the identity document, the insured s smart card and death certificate, and the original policy document. This information is checked against the information stored on the smart card by simply inserting the deceased s smart card into a POS device and printing the data associated with burial policy information. If valid, the claim is paid out to the beneficiary immediately.

Benefits. Our S2S Insurance intermediary product offers numerous benefits to insurance brokers and policyholders. For brokers, the system provides improved access to its potential client base, minimizes the risks associated with fraud through biometric fingerprint identification, facilitates legal compliance and provides a secure channel for collection of premiums. In addition, brokerage commissions can be managed through the system. The benefits for policyholders are generally the same as for customers as described above under S2S Retail and Wholesale. In addition, because the system reduces premium collection risk to the insurance company, it provides consumers with access to more affordable insurance products of a higher