Net1 UEPS technologies: providing to the world's unbanked

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Almost 100 years ago, Henry Ford realised the profit magic of producing cars for the mass market. A similar inspiration spurred computer scientist Serge Belamant to develop systems that do what the big banks and credit card companies have never done effectively: service the unbanked and underbanked

In its filing to the US Securities and Exchange Commission, preparatory to a listing on the NASDAQ in August, Net 1 UEPS Technologies states: "We believe we are the first company worldwide to implement a system that can enable the estimated 4 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."

A bold statement, backed by 16 years of research, development and practical experience involving some of the most advanced applications of smart card technology, cryptography and biometrics.

The path to the company's NASDAQ listing has been a long one which began with the vision of French-born computer scientist, Serge Belamant, of solving the plight of the unbanked. As the ideal test bed, Belamant chose South Africa, which provided a highly developed financial services and regulatory infrastructure alongside a large unbanked population. Together with his late partner, Andre Mansvelt, Belamant founded Net 1 UEPS Technologies in September 1989.

Pioneering work The result of their w6rk was one of the earliest applications of smart card technology, Net 1's patented Funds Transfer System (FTS) and Universal Electronic Payment Sys- tem (UEPS), of which the first version was released in 1991. In its development process, Net 1 is also credited with inventing the world's first electronic purse.

For his pioneering work, Belamant, who has spent 25 years working in the fields of operations research, security, biometrics, artificial intelligence and online and offline transaction processing systems, was awarded an honorary doctor of philosophy degree in information technology and management by Burkes University in the UK's overseas territory of the Turks and Caicos Islands in 2003.

Belamant was responsible for the design, development, implementation and operation of South Africa's Saswitch ATM network *in* South Africa. This *is* now the world's third- largest ATM switching system.

The unique element of Net 1 's UEPS sys- tem is its offline capabilities that are facilitated by moving processing away from a centralised point to the chip embedded on a smart card. "This is essential in serving the unbanked and underbanked who tend to be in areas either poorly served, or not served at all, by banking facilities," Belamant told *EPI.* Offline transactional capabilities are vital in serving the unbanked.

A smart card reader or point of sale (PaS) device equipped with Net 1 's FTS software is used to enable communication between smart cards in real time during a transaction and indirectly with Net 1 's mainframe computer at a later time. Despite being offline, the smart card can engage in sophisticated transaction processing using biometric fingerprint identification, symmetric triple data encryption and a random number generator to ensure security. "Since our inception in 1989 we have not suffered any security breaches or losses of transactions or funds on our system," noted Belamant.

Smart cards calculate interest

He explained that the transfer of money or other information takes place without any communication with a centralised computer since all validation, creation of audit records, encryption, decryption and authorisation takes place on, or are generated between, the smart cards themselves. "In fact, our smart cards can calculate the interest owed to the cardholder for having funds recorded onto our system without ever coming online," said Belamant.

Transactions are generally settled by merchants and other commercial participants in the system by sending the transaction data to a mainframe computer on a batch basis. Settlement can be performed online or offline. The mainframe computer provides a central database of transactions, creating a complete audit trail that enables Net 1 to identify fraud and replace lost smart cards while preserving the notional account balance.

'Wallet' functionality Since Net 1 smart cards perform all required processing and contain all of the different service features, they can be tailored to meet the needs of the individual. Belamant explained that the cards also facilitate a broad range of additional functionality through the use of what he called "wallets" that can be turned on as needed or as services become available. Up to 255 wallets can be configured and activated per cardholder, depending on the electrically erasable programmable read-only memory available on the particular smart card.

Wallets can also be restricted, allowing transactions to be performed only at specific merchants. For example, if an employer wants to subsidise 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 payments for particular goods or services.

"There is also no minimum income requirement for individuals to use our smart card, making our solution universally accessible," said Belamant. "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."

He added: "Even more importantly, our solution is secure and smart cards are replace- able. This means that individuals do not have to fear that their money will be stolen or that ~hey will be charged for fraudulent transactions." It also enables employers to eliminate cash from the wage payment process. This, he said, reduces expenses by avoiding cash handling and management, the need to insure or transport that cash and the bank transaction fees associated with obtaining cash in the first place.

"It's a proven solution," stressed Belamant. "Our system is being used increasingly and today over 3.3 million South Africans receive monthly government welfare or pension payments through our system under contracts with five [of nine] provinces." This equates to a market share of about 45 percent.

He added that in the past, welfare and pension recipients would immediately withdraw the full amount downloaded onto their card as cash. However, since the roll-out of UEPS's retail application into merchant stores began in July 2004, many are choosing to use their smart cards to undertake transactions. Importantly, beneficiaries are not charged for loading their smart card, performing balance enquiries, purchasing goods, drawing cash and effecting monthly debit orders.

Retail applications

Growth in the use of this service is proving rapid. During the nine months to March 2005, the rate of client purchases using Net 1 smart cards rather than merely download- ing the value for cash grew at a compounded monthly rate of 71 percent. The value of transactions grew at a compounded monthly rate of 60 percent.

By March this year Net 1 had 2,406 POS devices installed at 1,441 participating retail merchants. During the nine months to March the total value of transactions processed through UEPS merchant network was $59.7 million, a significant amount given the low average income level of card users involved. A special system has also been introduced for use in rural environments and by street hawkers.

Strong uptake of Net l's systems is also reflected in the company's revenue, which grew from $51.8 million in 2002 to $180 million (annualised) in the nine months to March 2005. Net taxed income went from $8.5 million to $46 million (annualised) during the period.

Net 1's activities are, however, not confined to emerging market technologies. One of its largest clients is Nedbank, one of South Africa's largest banks. Nedbank has contracted Net 1 to undertake the outsourcing management of its entire 18,500 POS device system, front-end switching computer platform, soft- ware development, 66,000 merchant smart cards and POS device maintenance. Net 1 also supplies Nedbank's POS devices and card readers.

The UEPS system would have many applications in a first world financial environment. "But we have chosen to focus on emerging markets," said Belamant. The reason is simple. "Why fight the giant card providers for 10 percent of the world market? It makes far more sense to go for the 90 percent that are not serviced where there are no barriers to entry."

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Serge Belamant, Net 1 UEPS Technologies

Belamant pointed out that according to the US Census Bureau, the world's population exceeds 6.4 billion people. Of this total over 4 billion people earn less than the purchasing parity equivalent of two dollars per day. These individuals generally receive wages, welfare benefits or loans in the form of cash and conduct commercial transactions, including buying food and clothing, in cash.

Belamant does not believe that EMV pro- vides a solution to the problem of the mass unbanked. He noted: "We looked at EMV many years ago and dumped the model; it is still in the times of archaic smart card technology. It is just a credit card, you can't load cash onto it, it is not secure enough and can't work offline."

He feels that con tactless cards do not rep- resent a challenge. "Limited power of the card's CPU restricts its capacity, making it unsuitable for complex transactions," said Belamant. His prognostication for the future of contactless cards is also bleak: "It will be leapfrogged by new technologies before it has a chance to become a standard."

However, he said, Net 1 has designed UEPS to inter-operate with other standard payment systems such as EMV. The reason, he said, was that in the future, smart card holders may wish to use their UEPS 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 cardholders can thus transact at EMV POS devices, but the functionality pro- vided at these POS devices is limited to that offered by the EMV, " he explained.

Going global

The morphing feature, Belamant added, is not limited to EMV, but can also be used with CEPS, Visa Horizon and Mondex, among other systems. "It places the UEPS cardholder 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."

Net 1 has already made good, albeit modest, progress outside of South Africa. "In Malawi, our system has been implemented by the Reserve Bank of Malawi as a national payment system," said Belamant. "To date, seven local Malawian financial institutions and BP's bulk fuel supply operation are usil1g our system for transaction switching and settlement."

Smaller, more limited versions of Net l's system have also been deployed in Burundi, Ghana, Latvia, Mozambique, Rwanda and Zimbabwe. In Russia, 1.6 million of Sber-bank's 200 million accountholders use Net I-backed cards.

"We believe there are significant opportunities for our system in developing economies such as Brazil, India, Mexico and Indonesia," said Belamant. The first step in establishing Net l's system in a new province or country is to establish a broad base of smart card users around a single application.

While government welfare payments pro- vide an ideal base, Belamant said viability is not dependent on government agencies. "Employers are widely examining our system to address their wage payment challenges and we are currently pursuing opportunities to deliver this solution." Net 1 is also eyeing the growing cross-border payments sector. "We are talking to US players about services into Africa."

Net 1, which is now a US domiciled company, is retaining its development base and other operations in South Africa. Its new US domicile, however, will provide greater flexibility to expand global operations, explained Belamant.