Lockstep Technologies

Stepwise – safety in numbers

With Lockstep's award winning Stepwise, you take better care of your digital identities

Lockstep Technologies' Stepwise radically enhances privacy and security for consumers on the Internet. Stepwise uses smartcards and similar personal security devices to de-identify sensitive transactions, such as credit card payments, e-health record entries, government services, and online social networking. Stepwise prevents ID theft, increases convenience and speed, and enhances privacy by dispensing with extraneous personal details.

Our numbers are under attack!

We all live and work by our numbers – or *digital identities*. Personal identifiers, credit card numbers, customer reference numbers, policy IDs, licence and membership numbers are all part and parcel of today's world. Each digital identity succinctly represents our standing in a community of interest, or our business relationship with a service provider.

When we look closely at identity fraud, the fundamental problem is that digital identities are simply too easy to copy! Account IDs and driver license numbers are quoted and copied so often that on their own, they're no longer sufficient to establish a customer's bona fides. And so we have to play 'twenty questions' with call centre operators because they cannot trust any number alone.

There's a cyber-crime arms race, and customer safety and convenience are losing. Transactions involve more and more layers of secrets, like the CCV numbers printed on the backs of our credit cards. They bought us a little more security for a little while longer but now organised cyber criminals buy and sell CCVs in the millions, along with the comprehensive personal details of credit card holders.

The Lockstep solution

Stepwise encapsulates digital identities – be they customer reference numbers, identifiers, biometrics or any other ID – and seals them cryptographically into a chip. It might be a smartcard or a SIM, or it can be a dedicated USB key. Each digital identity is isolated, stripped of all extraneous personal detail and linkages, and placed under the sole control of its owner. *Stepwise* ensures that when any ID is presented online, the receiver knows that it's legitimate, it came from a genuine security device, and that it was used with consent. *Stepwise* makes digital identities trustworthy again and in the process, stems the leakage of personal information.

Stepwise benefits

- *Stepwise* digital identities cannot be cloned, counterfeited, or illicitly copied
- each transaction originating from a *Stepwise* enabled chip is sealed with its respective ID, contains the bare minimum personal information, and cannot be cross-linked with other transactions
- every *Stepwise* transaction bears a tamper-proof pedigree, proving it originated from an authentic device carrying a bona fide ID, used with the consent of the cardholder.

Stepwise for Card Not Present payments

One of the most pressing problems in Internet security today is Card Not Present (CNP) fraud. Now the most common type of payment card fraud, CNP fraud for FY08 totalled AU$63M in Australia and exceeded £320m in the UK.

Now *Stepwise* offers a quantum jump in CNP security, by providing merchants the means to trust credit card details presented online. *Stepwise* can be integrated with the credit card associations' *3D Secure* protocol, or deployed standalone, to dramatically cut fraud and create a more user friendly EFTPOS-like experience in the customer's browser. At the same time, *Stepwise* protects consumer privacy, dramatically streamlines payment processing, and reduces merchant risks in safeguarding cardholder data.

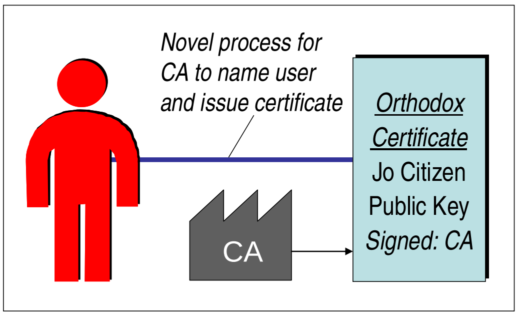
www.lockstep.com.au/technologies

Stepwise – how it works

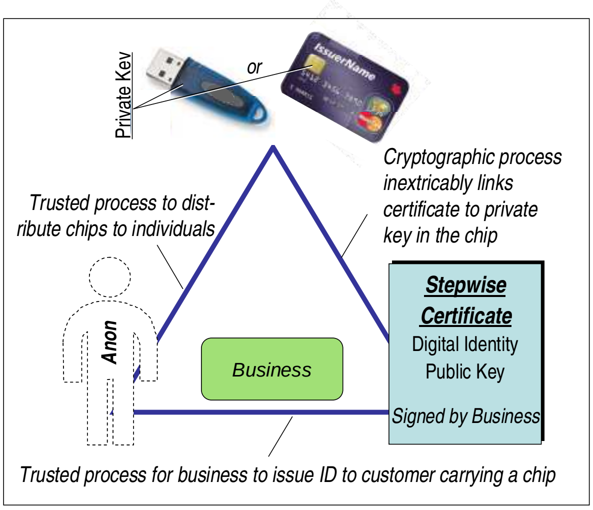
It is well known that smartcards can store multiple personal identifiers in different “containers” or memory “slots”. But the conventional approach means that outside the smartcard, identifiers revert to being ordinary numbers, and become vulnerable to theft, replay attack, and counterfeiting. In con-trast, *Stepwise* protects the pedigree of digital identities across their whole lifecycle.

The *Stepwise* innovation

Stepwise applies digital certificates in a brand new way. An orthodox digital certificate is a signed declaration by a Certification Authority (CA) that a named individual, together with certain attributes, is associated with a cryptographic key. The logic was, if you trusted the CA then you trusted the association. But there was no intrinsic privacy in this arrangement, and with most CAs being new start-up businesses, trust was problematic.



Lockstep’s breakthrough has been to insert into the relationship a tamper resistant key store such as a smartcard, allowing the declaration to be de-identified. *Stepwise* involves a standard digital certificate, issued to a device held by the user, and signed separately by a particular business with whom the user has a trusted relationship – like a bank, a health body, a licensing authority or a government agency. Thus the digital ID is joined to a device, and the device is joined separately to the individual. *Stepwise* decouples the ID from the person, so they can transact using that ID without revealing who they are. The individual remains anonymous to all third parties, unless and until they present their chip.


Private Key
or
IssuerName
Cryptographic process inextricably links certificate to private key in the chip
Trusted process to distribute chips to individuals
Anon
Business
Stepwise Certificate
Digital Identity
Public Key
Signed by Business
Trusted process for business to issue ID to customer carrying a chip

Stepwise thereby triangulates three trusted processes:

1. issuance of devices like smartcards to individuals
2. assignment of digital identities to known customers, and
3. binding of digital certificates to keys held in chips.

When a transaction is digitally signed using a *Stepwise* certificate, the transaction data is indelibly bound to the encapsulated digital identity but contains no other personally identifying information.

Lockstep intellectual property

Stepwise is protected by Australian patents PCT/AU2005/000364 and PCT/AU2005/000522. Patents are pending in Europe and the USA.

Stepwise system requirements

— Multi-programmable smart chip (e.g. smartcard, USB key or 2.5G SIM) with cryptographic co-processor

— EEPROM 64K or higher

— RSA or DSA signing keys of 1024 bits or more

— PKCS#10 certificate request interface or equivalent.