eCommerce
Identification

Mobile PIN
An alternative to TAN lists

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Version: **1.0, 2002-01-21**

Abstract:
In Germany most bank transactions are released with a so-called TAN (Transaction Number). Because of the fact that the number of mobile devices is increasing rapidly the usage of mobile phones as medium for transaction release provides an alternative. Mobile PIN is a method for transaction release using mobile devices which is attractive for two very interesting groups of customers. This study shows how using a mobile PIN can provide new entry channels and increase the number of low-priced online transactions.

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Basics

Nearly all German banks are offering online banking for conducting payment and brokerage transactions to their private customers.
The fast success is based on the fact that both private customers and banks have advantages using these applications. Private customers can conduct their bank transactions conveniently at home. The transactions are submitted electronically. This implicates that banks can save payment and brokerage transactions' expenses (handling expenses, personnel costs). Therefore banks are anxious to process as many transactions as possible online.
Observing the procedure of an online banking transaction the following processes can be identified:

a) A customer has to be identified by the bank before he can get access to his account
   ➔ IDENTIFICATION
b) Before conducting a specific business transaction (money transfer, brokerage, etc.) the bank verifies the customer's solvency
   ➔ AUTHORISATION
c) The assignment of a specific business transaction has to be explicitly confirmed by the customer
   ➔ TRANSACTION RELEASE

Banks are issuing so-called TAN lists to their customers for transaction release purposes. A TAN list is a piece of paper which normally contains about fifty 6-digit numbers. Every number is a TAN (transaction number).
It is characteristic for a TAN that it can be used only once to release a transaction. In case a TAN was used, the customer crosses out the TAN from his list. For the next transaction he has to use one of the remaining numbers.

PIN/TAN

It is assumed that the usage of the PIN/TAN-method is well known. Therefore only the main characteristics are described in this document.
In principle it is possible to conduct an online transaction by entering the PIN a second time[1] but this method is not used in Germany because of the public discussions about security.
In fact it is possible to increase the security level by combining PIN and TAN. The increased security results from the combination of two security mechanisms. Since the TAN list is sent to the customer on a sheet of paper, a potential attacker needs to get access to both the mailbox and the customer's PC[2] before he can perform a transaction pretending to be someone else.

From the customer's point of view the most important disadvantage of the PIN/TAN method is that the TAN list has to be carried along in a wallet or something equivalent in order to conduct transactions anywhere.
The TAN list handling requires special carefulness. Therefore most customers avoid using it. One essential advantage of the online banking systems, the independency from the location, is indeed not applicable.

Mobile PIN

Because of the high market penetration of mobile phones there is the opportunity to use the mobile phones as identification and/or transaction release mechanism[3].
Instead of entering a TAN the customer's mobile phone is called and the customer is asked to enter his mobile PIN (Personal Identification Number) in order to release

[1] This method is very popular in the United States.
[2] For example, the attacker can use a Trojan horse in order to get the information on the PIN.
[3] Only the usage of a mobile PIN as transaction release mechanism is considered.

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the current transaction.[4] The mobile PIN has to be specified in advance. As for the PIN/TAN mechanism the security results from the combination of two security mechanisms.
The particular PINs are entered via two access channels (internet and mobile network). In addition to this, there is no need to use a TAN any longer because the customer's mobile phone is called directly by the bank system and the mobile phone acts as an additional security and identification medium.
A potential attacker needs to get access to both the PC and the mobile phone before he can cheat pretending to be someone else. Since mobile phone owners are normally carrying their mobile phones along a good alternative to the PIN/TAN method can be created which fully supports the independency of the online banking application from the customer's location.

Save expenses because of the mobile PIN

The most important cost factors for the PIN/TAN methods are the printing, the delivery and the management of the TAN lists. Because of the fact that the mobile PIN can be used many times these expenses are reduced to the costs for the management of one single PIN for every customer. It can be assumed that altogether more paper based transactions are substituted by online transactions since the independency from the location can be assured. This will save expenses in a significant way.

Trend factor mobile PIN

One factor of the mobile PIN which shouldn't be underestimated is the specific customer clientele to which online banking with mobile PIN is addressed:
People who are often away on business (the income of this group is significantly more than the average) and the younger generation which has grown up with mobile phones and SMS. Both segments are normally in the strategic focus of online banks.

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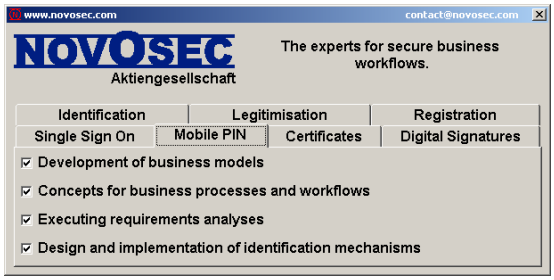

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[4] The company paybox is establishing an online payment system, which uses this mechanism in order to release payment transactions.