A short introduction to

Online Credit Card Processing

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Objective

Our objective is to allow clients of our online store to pay electronically, by means of credit card or debit card, or via online bank transfer. This will make it easier for them to complete a shopping cycle online, while on our part the work to process payments is also simplified. This document attempts to describe the steps needed to setup credit card processing for online shops.

Background

In order to understand our needs, some functional and technical background is required. The following paragraphs introduce the reader to various aspects of online credit card processing.

Accepting credit cards online with a merchant account

To accept credit cards, normally an *online* merchant account with a national bank is required. An existing offline merchant account is usually not sufficient. Online credit cards transactions are not signed with a signature, so the risk involved is a bit higher. Because of this, different rates are charged than for offline credit card processing.

The following considerations are important when looking for a merchant account.

- **Cost**

  Usually the costs are subdivided into setup fee, fixed periodic costs, and a cost per transaction (either fixed or a percentage of the transaction value). Additionally there may be costs such as additional charging per supported currency, insurance, chargeback costs, POS/pinpad hardware, etc. A registered SSL certificate is generally required.

- **Is the provider capable of fulfilling our needs?**

  Not all online merchant account providers have the ability to provide an account to countries other than their own, or in the currency that we want. Some merchants may not allow international payment. Most are willing to help with the integration or offer pre-made solutions.

- **Chargeback protection**

  Clients may decide to reverse a transaction, even months after receiving the product. If this happens, not only will you lose the money of the original payment, but in addition merchants account providers often charge an additional fee to reverse the transaction.

  Some merchant accounts offer an insurance against chargebacks. Some providers reserve the right to terminate your merchant account if it has more than a given percentage of chargeback transactions. It may be worthwhile to subscribe to a site such as http://chargebackbureau.org to pre-filter customers with chargeback habits.

- **Delays**

  Some providers delay payment for a few weeks, allowing them to charge lower prices. If the owner of the online store has the policy of only shipping items when the money has been received, this could be a problem.

- **Reputation**

  Not all merchant providers are equally trustable. Check them out first.

Accepting credit card transactions without merchant account

Some companies allow you to handle credit card transactions without the need for a merchant account, although they do need registration as well.

Most considerations for merchant-account based credit card processing (discussed previously) also apply for credit card processing without merchant account, more so the part about checking the providers' reputation. Some companies that do credit card processing without requiring you to have a merchant account are PayPal (http://www.paypal.org), SWREG (http://www.swreg.org) and RegSoft (http://www.regsoft.com). The rates may be higher than with a merchant-account; for example, RegSoft charges 10% with a 3 dollar minimum, but this already includes various services such as Charge-back insurance and fraud protection.

Validating the transaction

Validating the transaction is needed to prevent fraud. A merchant account wil generally require that proper transaction validation is done by you.

It is possible to check an entered credit card number for a few characteristics, to see if it could possibly be a valid card number. Checking only the card number itself however is not enough to know if the account is real, unexpired, and if it has sufficient funds.

Online services that provide such checks are for instance CyberCash (U.S.) or SecureTrading (U.K). These services also allow payments by foreign cards and in various currencies, if desired.

Offline services are also available (either by serial link or other) but these may prevent us from doing real-time transaction validation and real-time credit card processing.

Information about the credit card number itself

Each credit card has a number. This number serves to identify the account of the holder. To help us make sure a credit card number is valid, it has a few properties which help the validation:

- **The company that issued the credit card can be identified by the first few numbers of the credit card.**
- **The length of the number is generally 13 to 16 digits (although theoretically the future would allow using longer numbers). The most common length is 16 numbers.**
- **The number contains a check digit which gives some protection against incorrect data entry. The credit card number can be validated with the LUHN-10, which possibly could also catch carelessly invented credit card numbers. It should however not be relied on for security—it is easy to generate complete ranges of numbers that satisfy the LUHN-10 check as 1 out of 10 numbers is a valid credit card number.**

The following table shows the prefixes of major credit cards that we might want to validate:

Prefix	Length	Card Type
51-55	16	Mastercard
4	13,16	VISA
34,37	15	American Express
300-305, 36, 38	14	Diners Club/Carte Blanche
6011	16	Discover
2014,2149	15	EnRoute
3	16	JCB
2131,1800	15	JCB

The LUHN-10 algorithm

The following steps are required to validate the primary account number:

- **Double the value of alternate digits of the primary account number beginning with the second digit from the right (the first right--hand digit is the check digit.)**
- **Add the individual digits comprising the products obtained in the previous step to each of the unaffected digits in the original number**
- **If the total obtained in the previous step is a number ending in zero (30, 40, 50, etc.) the account number is considered valid.**

For example, to validate the primary account number 49927398716:

- **Every other digit is doubled with the right hand digit remaining intact:**

  6 (1*2) 7 (8*2) 9 (3*2) 7 (2*2) 9 (9*2) 4

- **The products are now**

  6 2 7 16 9 6 7 4 9 18 4

- **The digits of the products are summed:**

  6+2+7+1+6+9+6+7+4+9+1+8+4=70

- **This number ends in zero so it is considered valid.**

Links and references

- **Various online merchant account providers**

  http://www.redunicre.pt

  Portuguese merchant account provider, offers professional, complete documentation, however does not seem to allow international transfers.

  http://www.worldpay.com

  Positive recommendations and reasonable rates, this provider makes it easy to get started.

- **Providers of credit card processing without merchant account**

  http://www.paypal.org

  An online credit card processing provider with questionable reputation, however may be suitable enough for transactions of small value. The owner of site http://www.processu.pt uses this service successfully to create a bit of extra income.

  http://www.swreg.org

  A credit card service provider for shareware.

  http://www.regsoft.com

  Like swreg.org, offers a range of services.

- **Various unfiltered providers**

  http://quickinfo247.com/7370003/usms

  A site that allows choosing 'just realtime online credit card processing'

- **Credit card validation services**

  http://www.securetrading.com

  UK based validation service.

  http://www.cybercash.com

  US based validation service.

- **Chargeback protection**

  http://www.chargebackbureau.org

  This site keeps a blacklist of customers that reverse transactions.

- **Technical references**

  http://www.beachnet.com/~hstiles/cardtype.html
  http://www.ICverify.com

  The first is an informational link describing the LUHN-10 card number validation algorithm, claiming it got the information from the second link, which is a credit card validation service.