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## ECML v1.1: Field Specifications for E-Commerce

### Status of this Memo

This memo provides information for the Internet community. It does not specify an Internet standard of any kind. Distribution of this memo is unlimited.

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### IESG Note:

This document specifies version 1.1 of ECML and obsoletes RFC 2706 which specifies version 1.0 of ECML. Both version 1.0 and 1.1 of ECML are products of the ECML alliance which is described in section 1.1 of this document. The reader should note that version 2.0 of ECML is under development (as of the publication of this RFC) in the IETF in the TRADE Working Group.

### Abstract

Customers are frequently required to enter substantial amounts of information at an Internet merchant site in order to complete a purchase or other transaction, especially the first time they go there. A standard set of information fields is defined as the first version of an Electronic Commerce Modeling Language (ECML) so that this task can be more easily automated, for example by wallet software that could fill in fields. Even for the manual data entry case, customers will be less confused by varying merchant sites if a substantial number adopt these standard fields. In addition, some fields are defined for merchant to consumer communication.

## Acknowledgements

The following persons, in alphabetic order, contributed substantially to the material herein:

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## 1. Introduction

Today, numerous merchants are successfully conducting business on the Internet using HTML-based forms. The data formats used in these forms vary considerably from one merchant to another. End-users find the diversity confusing and the process of manually filling in these forms to be tedious. The result is that many merchant forms, reportedly around two thirds, are abandoned during the fill in process.

Software tools called electronic wallets can help this situation. A digital wallet is an application or service that assists consumers in conducting online transactions by allowing them to store billing, shipping, payment, and preference information and to use this

information to automatically complete merchant interactions. This greatly simplifies the check-out process and minimizes the need for a consumer to think about and complete a merchant's form every time. Digital wallets that fill forms have been successfully built into browsers, as proxy servers, as helper applications to browsers, as stand-alone applications, as browser plug-ins, and as server-based applications. But the proliferation of electronic wallets has been hampered by the lack of standards.

ECML (Electronic Commerce Modeling Language, <[www.ecml.org](http://www.ecml.org)>) provides a set of simple guidelines for web merchants that will enable electronic wallets from multiple vendors to fill in their web forms. The end-result is that more consumers will find shopping on the web to be easy and compelling.

Version 1.1 has been enhanced over Version 1.0 [RFC 2706] as described in the appendix to this document. These enhancements include support for communication from the merchant to the wallet. This information can be used by the wallet to present transaction information and possibly signed receipts. The format of the signatures for receipts is not specified in this document.

Multiple wallets and multiple merchants interoperably support ECML. This is an open standard. ECML is designed to be simple. Neither Version 1.0 nor Version 1.1 of the project add new technology to the web. A merchant can adopt ECML and gain the support of these multiple Wallets by making very simple changes to their site. Use of ECML requires no license.

## 1.1 The ECML Alliance

The set of fields documented herein was developed by the ECML Alliance ([www.ecml.org](http://www.ecml.org)) which now includes, in alphabetic order, the fifteen Steering Committee members listed below and numerous General Members some of whom are listed on the ECML web site.

1. American Express ([www.americanexpress.com](http://www.americanexpress.com))
2. AOL ([www.aol.com](http://www.aol.com))
3. Brodia ([www.brodia.com](http://www.brodia.com))
4. Compaq ([www.compaq.com](http://www.compaq.com))
5. CyberCash ([www.cybercash.com](http://www.cybercash.com))
6. Discover ([www.discovercard.com](http://www.discovercard.com))
7. FSTC ([www.fstc.org](http://www.fstc.org))
8. IBM ([www.ibm.com](http://www.ibm.com))
9. Mastercard ([www.mastercard.com](http://www.mastercard.com))
10. Microsoft ([www.microsoft.com](http://www.microsoft.com))
11. Novell ([www.novell.com](http://www.novell.com))
12. SETCo ([www.setco.org](http://www.setco.org))

13. Sun Microsystems ([www.sun.com](http://www.sun.com))
14. Trintech ([www.trintech.com](http://www.trintech.com))
15. Visa International ([www.visa.com](http://www.visa.com))

## 1.2 Relationship to Other Standards

The ECML fields were initially derived from and are consistent with the W3C P3P base data schema at

<http://www.w3.org/TR/WD-P3P/basedata.html>.

ECML Version 1.1 is not a replacement or alternative to SSL/TLS [RFC 2246], SET [SET], XML [XML], or IOTP [RFC 2801]. These are important standards that provide functionality such as non-repudiatable transactions, automatable payment scheme selection, and smart card support.

ECML may be used with any payment mechanism. It simply allows a merchant to publish consistent simple web forms. Information on the use of the ECML fields with W3C P3P protocol is available at <http://www.w3.org/TR/P3P-for-ecommerce> which also includes some proposed extension fields. These extension fields may be included in a future version of ECML.

## 1.3 Areas Deferred to Future Versions

Considerations for business purchasing cards, non-card payment mechanisms, wallet activation, privacy related mechanisms, additional payment mechanisms, currency exchange, and any sort of "negotiation" were among the areas deferred to consideration in future versions. Hidden or other special fields were minimized.

## 2. Field Definitions and DTD

The ECML Standard is primarily the definition and naming of fields. These fields can be encoded in a variety of syntaxes and protocols.

Section 2.1 below lists and describes the fields, Section 2.2 gives additional notes on HTML usage of the fields, and Section 2.3 provides an XML DTD for use with the fields.

### 2.1 Field List and Descriptions

The fields are listed below along with the minimum data entry size to allow. Note that these fields are hierarchically organized as indicated by the embedded underscore ("\_") characters. Appropriate data transmission mechanisms may use this to request and send aggregates, such as `Ecom_Payment_Card_ExpDate` to encompass all the

date components or Ecom\_ShipTo to encompass all the ship to components that the consumer is willing to provide. The labeling, marshalling, unmarshalling of the components of such aggregates depends on the data transfer protocol used.

### 2.1.1 Field List

IMPORTANT NOTE: "MIN" in the table below is the MINIMUM DATA SIZE TO ALLOW FOR ON DATA ENTRY. It is NOT the minimum size for valid contents of the field and merchant software should, in most cases, be prepared to receive a longer or shorter value. Merchant dealing with areas where, for example, the state/province name or phone number is longer than the "Min" given below must obviously permit longer data entry. In some cases, however, there is a maximum size that makes sense and where this is the case, it is documented in a Note for the field.

The following fields are used to communicate from the customer to the merchant:

FIELD	NAME	Min	Notes
ship to title	Ecom_ShipTo_Postal_Name_Prefix	4	( 1)
ship to first name	Ecom_ShipTo_Postal_Name_First	15	
ship to middle name	Ecom_ShipTo_Postal_Name_Middle	15	( 2)
ship to last name	Ecom_ShipTo_Postal_Name_Last	15	
ship to name suffix	Ecom_ShipTo_Postal_Name_Suffix	4	( 3)
ship to company name	Ecom_ShipTo_Postal_Company	20	
ship to street line1	Ecom_ShipTo_Postal_Street_Line1	20	( 4)
ship to street line2	Ecom_ShipTo_Postal_Street_Line2	20	( 4)
ship to street line3	Ecom_ShipTo_Postal_Street_Line3	20	( 4)
ship to city	Ecom_ShipTo_Postal_City	22	
ship to state/province	Ecom_ShipTo_Postal_StateProv	2	( 5)
ship to zip/postal code	Ecom_ShipTo_Postal_PostalCode	14	( 6)
ship to country	Ecom_ShipTo_Postal_CountryCode	2	( 7)
ship to phone	Ecom_ShipTo_Telecom_Phone_Number	10	( 8)
ship to email	Ecom_ShipTo_Online_Email	40	( 9)
bill to title	Ecom_BillTo_Postal_Name_Prefix	4	( 1)
bill to first name	Ecom_BillTo_Postal_Name_First	15	
bill to middle name	Ecom_BillTo_Postal_Name_Middle	15	( 2)
bill to last name	Ecom_BillTo_Postal_Name_Last	15	
bill to name suffix	Ecom_BillTo_Postal_Name_Suffix	4	( 3)
bill to company name	Ecom_BillTo_Postal_Company	20	
bill to street line1	Ecom_BillTo_Postal_Street_Line1	20	( 4)
bill to street line2	Ecom_BillTo_Postal_Street_Line2	20	( 4)
bill to street line3	Ecom_BillTo_Postal_Street_Line3	20	( 4)

bill to city	Ecom_BillTo_Postal_City	22	
bill to state/province	Ecom_BillTo_Postal_StateProv	2	( 5)
bill to zip/postal code	Ecom_BillTo_Postal_PostalCode	14	( 6)
bill to country	Ecom_BillTo_Postal_CountryCode	2	( 7)
bill to phone	Ecom_BillTo_Telecom_Phone_Number	10	( 8)
bill to email	Ecom_BillTo_Online_Email	40	( 9)
receipt to			(32)
receipt to title	Ecom_ReceiptTo_Postal_Name_Prefix	4	( 1)
receipt to first name	Ecom_ReceiptTo_Postal_Name_First	15	
receipt to middle name	Ecom_ReceiptTo_Postal_Name_Middle	15	( 2)
receipt to last name	Ecom_ReceiptTo_Postal_Name_Last	15	
receipt to name suffix	Ecom_ReceiptTo_Postal_Name_Suffix	4	( 3)
receipt to company name	Ecom_ReceiptTo_Postal_Company	20	
receipt to street line1	Ecom_ReceiptTo_Postal_Street_Line1	20	( 4)
receipt to street line2	Ecom_ReceiptTo_Postal_Street_Line2	20	( 4)
receipt to street line3	Ecom_ReceiptTo_Postal_Street_Line3	20	( 4)
receipt to city	Ecom_ReceiptTo_Postal_City	22	
receipt to state/province	Ecom_ReceiptTo_Postal_StateProv	2	( 5)
receipt to postal code	Ecom_ReceiptTo_Postal_PostalCode	14	( 6)
receipt to country	Ecom_ReceiptTo_Postal_CountryCode	2	( 7)
receipt to phone	Ecom_ReceiptTo_Telecom_Phone_Number	10	( 8)
receipt to email	Ecom_ReceiptTo_Online_Email	40	( 9)
name on card	Ecom_Payment_Card_Name	30	(10)
card type	Ecom_Payment_Card_Type	4	(11)
card number	Ecom_Payment_Card_Number	19	(12)
card verification value	Ecom_Payment_Card_Verification	4	(13)
card expire date day	Ecom_Payment_Card_ExpDate_Day	2	(14)
card expire date month	Ecom_Payment_Card_ExpDate_Month	2	(15)
card expire date year	Ecom_Payment_Card_ExpDate_Year	4	(16)
card protocols	Ecom_Payment_Card_Protocol	20	(17)
consumer order ID	Ecom_ConsumerOrderID	20	(18)
user ID	Ecom_User_ID	40	(19)
user password	Ecom_User_Password	20	(19)
schema version	Ecom_SchemaVersion	30	(20)
wallet id	Ecom_WalletID	40	(21)
end transaction flag	Ecom_TransactionComplete	-	(22)

The following fields are used to communicate from the merchant to the consumer:

FIELD	NAME	Min	Notes
merchant home domain	Ecom_Merchant	128	(23)
processor home domain	Ecom_Processor	128	(24)
transaction identifier	Ecom_Transaction_ID	128	(25)
transaction URL inquiry	Ecom_Transaction_Inquiry	500	(26)
transaction amount	Ecom_Transaction_Amount	128	(27)
transaction currency	Ecom_Transaction_CurrencyCode	3	(28)
transaction date	Ecom_Transaction_Date	80	(29)
transaction type	Ecom_Transaction_Type	40	(30)
transaction signature	Ecom_Transaction_Signature	160	(31)
end transaction flag	Ecom_TransactionComplete	-	(22)

FIELD	NAME	Min	Notes
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IMPORTANT NOTE: "MIN" in the table above is the MINIMUM DATA SIZE TO ALLOW FOR ON DATA ENTRY. It is NOT the minimum size for valid contents of the field and merchant software should, in most cases, be prepared to receive a longer or shorter value. Merchant dealing with areas where, for example, the state/province name or phone number is longer than the "Min" given below must obviously permit longer data entry. In some cases, however, there is a maximum size that makes sense and this is documented in a Note for the field.

### 2.1.2 Field Foot Notes

( 1) For example: Mr., Mrs., Ms., Dr. This field is commonly not used.

( 2) May also be used for middle initial.

( 3) For example: Ph.D., Jr. (Junior), 3rd, Esq. (Esquire). This field is commonly not used.

( 4) Address lines must be filled in the order line1, then line2, and last line3.

( 5) 2 characters are the minimum for the US and Canada, other countries may require longer fields. For the US use 2 character US Postal state abbreviation.

( 6) Minimum field lengths for Postal Code will vary based on international market served. Use 5 character or 5+4 ZIP for the US and 6 character postal code for Canada. The size given, 14, is believed to be the maximum required anywhere in the world.

( 7) Use [ISO 3166] standard two letter codes. See <http://www.din.de/gremien/nas/nabd/iso3166ma/index.html> for country names.

( 8) 10 digits are the minimum for numbers local to the North American Numbering Plan (<http://www.nanpa.com>): US, Canada and a number of smaller Caribbean and Pacific nations (but not Cuba)), other countries may require longer fields. Telephone numbers are complicated by differing international access codes, variant punctuation of area/city codes within countries, confusion caused by the fact that the international access code in the NANP region is usually the same as the "country code" for that area (1), etc. It will probably be necessary to use heuristics or human examination based on the telephone number and addresses given to figure out how to actually call a customer. It is recommend that an "x" be placed before extension numbers.

( 9) For example: jsmith@example.com

(10) The name of the cardholder.

(11) Use the first 4 letters of the association name:

AMER	American Express
BANK	Bankcard (Australia)
DC	DC (Japan)
DINE	Diners Club
DISC	Discover
JCB	JCB
MAST	Mastercard
NIKO	Nikos (Japan)
SAIS	Saison (Japan)
UC	UC (Japan)
UCAR	UCard (Taiwan)
VISA	Visa

(12) Includes the check digit at end but no spaces or hyphens [ISO 7812]. The Min given, 19, is the longest number permitted under the ISO standard.

(13) An additional cardholder verification number printed on the card (but not embossed or recorded on the magnetic stripe) such as American Express' CIV, MasterCard's CVC2, and Visa's CVV2 values.



(14) The day of the month. Values: 1-31. A leading zero is ignored so, for example, 07 is valid for the seventh day of the month.

(15) The month of the year. Jan - 1, Feb - 2, March - 3, etc.; Values: 1-12. A leading zero is ignored so, for example, 07 is valid for July.

(16) The value in the wallet cell is always four digits, e.g., 1999, 2000, 2001, ...

(17) A space separated list of protocols available in connection with the specified card. Initial list of case insensitive tokens:

none  
set  
setcert  
iotp  
echeck  
simcard  
phoneid

"Set" indicates usable with SET protocol (i.e., is in a SET wallet) but does not have a SET certificate. "Setcert" indicates same but does have a set certificate. "iotp" indicates the IOTP protocol [RFC 2801] is supported at the customer. "echeck" indicates that the eCheck protocol [eCheck] is supported at the customer. "simcard" indicates use the transaction instrument built into a Cellphone subscriber for identification. "phoneid" indicates use the transaction instrument of a phone bill instrument. "None" indicates that automatic field fill is operating but there is no SET wallet or the card is not entered in any SET wallet.

(18) A unique order ID generated by the consumer software.

(19) The user ID and password fields are used in cases where the user has a pre-established account with the merchant.

(20) URI indicating version of this set of fields. Usually a hidden field. Equal to "http://www.ecml.org/version/1.1" for this version.

(21) A string to identify the source and version of the form fill software that is acting on behalf of the user. Should contain company and/or product name and version. Example "Wallets Inc., SuperFill, v42.7". Usually a hidden field.

(22) A flag to indicate that this web-page/aggregate is the final one for this transaction. Usually a hidden field.

(23) Merchant domain name such as `www.merchant.example`. This is usually a hidden field.

(24) Gateway transaction processor who is actually accepting the payment on behalf of the merchant in home domain such as `www.processor.example`. This is usually a hidden field.

(25) A Transaction identification string whose format is specific to the processor. This is usually a hidden field.

(26) A URL that can be invoke to inquire about the transaction. This is usually a hidden field.

(27) The amount of the transaction in ISO currency format. This is two integer numbers with a period in between but no other currency marks (such as a \$ dollar sign). This is usually a hidden field.

(28) This is the three letter ISO currency code. For example, for US dollars it is USD. This is usually a hidden field.

(29) ISO Transaction date. This is usually a hidden field.

(30) The type of the transaction (either debit or credit) if known. This is usually a hidden field.

(31) The signature of the encoded certificate. This is usually a hidden field.

(32) The Receipt To fields are used when the Bill To entity, location, or address and the Receipto entity, location, or address are different. For example, when using some forms of Corporate Purchasing Cards or Agent Purchasing Cards, the individual card holder would be in the Receipt To fields and the corporate or other owner would be in the Bill To fields.

## 2.2 Use in HTML

The normal use of ECML in HTML is as a form with input field names identical to those given in section 2.1 above. In general, `<INPUT>` tags with type text, hidden, and password must be supported as must `<SELECT>` tags.

Internationalization in HTML is limited. The information available with the HTML form Method as to character set and language SHOULD be used.

### 2.3 An ECML 1.1 XML DTD

Below is an XML DTD that can be used for the XML encoding of ECML v1.1 Fields.

For internationalization of [XML] ECML, use the general XML character encoding provisions, which mandate support of UTF-8 and UTF-16 and permit support of other character sets, and the xml:lang attribute which may be used to specify language information.

```
<!-- Electronic Commerce Modeling Language 1.1 -->

<!ELEMENT Ecom ( #PCDATA | ShipTo | BillTo | ReceiptTo | Payment |
                  User | Transaction | TransactionComplete )* >
<!ATTLIST Ecom
    id            ID            #IMPLIED
    ConsumerOrderID CDATA #IMPLIED
    Merchant      CDATA         #IMPLIED
    Processor     CDATA         #IMPLIED
    SchemaVersion ( "http://www.ecml.org/version/1.0" |
                    "http://www.ecml.org/version/1.1" )
                  #IMPLIED
    WalletID      CDATA         #IMPLIED >

<!ELEMENT ShipTo ( #PCDATA | Postal | Telecom | Online )* >
<!ATTLIST ShipTo
    id            ID            #IMPLIED >

<!ELEMENT BillTo ( #PCDATA | Postal | Telecom | Online )* >
<!ATTLIST BillTo
    id            ID            #IMPLIED >

<!ELEMENT ReceiptTo ( #PCDATA | Postal | Telecom | Online )* >
<!ATTLIST ReceiptTo
    id            ID            #IMPLIED >

<!ELEMENT Postal ( #PCDATA | Name | Company |
                    Street | City | StateProv )* >
<!ATTLIST Postal
    id            ID            #IMPLIED
    PostalCode    NMTOKEN       #IMPLIED
    CountryCode   NMTOKEN       #IMPLIED >

<!ELEMENT Name EMPTY >
<!ATTLIST Name
    id            ID            #IMPLIED
    Prefix        NMTOKEN       #IMPLIED
    First         NMTOKEN       #IMPLIED
```

```

        Middle      NMTOKEN      #IMPLIED
        Last        NMTOKEN      #IMPLIED
        Suffix      NMTOKEN      #IMPLIED >

<!ELEMENT Street EMPTY >
<!ATTLIST Street
    id            ID            #IMPLIED
    Line1         CDATA         #REQUIRED
    Line2         CDATA         #IMPLIED
    Line3         CDATA         #IMPLIED >

<!ELEMENT Company #PCDATA >

<!ELEMENT City #PCDATA >

<!ELEMENT StateProv #PCDATA >

<!ELEMENT Telecom ( #PCDATA | Phone )* >

<!ELEMENT Phone EMPTY >
<!ATTLIST Phone
    id            ID            #IMPLIED
    Number        CDATA         #REQUIRED >

<!ELEMENT Online ( #PCDATA | Email )* >

<!ELEMENT Email EMPTY >
<!ATTLIST Email
    id            ID            #IMPLIED
    Address       CDATA         #REQUIRED >

<!ELEMENT Payment Card>

<!ELEMENT Card ExpDate >
<!ATTLIST Card
    id            ID            #IMPLIED
    Name          CDATA         #IMPLIED
    Type          NMTOKEN       #IMPLIED
    Number        NMTOKEN       #REQUIRED
    Protocols     NMTOKENS      #IMPLIED
    Verification  NMTOKEN       #IMPLIED >

<!ELEMENT ExpDate EMPTY >
<!ATTLIST ExpDate
    id            ID            #IMPLIED
    Day           NMTOKEN       #IMPLIED
    Month         NMTOKEN       #REQUIRED
    Year          NMTOKEN       #REQUIRED >

```

```

<!ELEMENT User ( #PCDATA | UserID | Password )* >
<!--ATTLIST User
      id          ID          #IMPLIED >

<!ELEMENT UserID #PCDATA >

<!ELEMENT Password #PCDATA >

<!--ELEMENT Transaction ( #PCDATA | TransactionID | Inquiry |
                          TransDate | Signature )* >
<!--ATTLIST Transaction
      id          ID          #IMPLIED
      Amount      CDATA      #IMPLIED
      Currency    NMTOKEN    #IMPLIED
      Type        NMTOKEN    #IMPLIED >

<!--ELEMENT TransactionComplete EMPTY>

```

### 3. Using The Fields

To conform to this document, the field names must be structured and named as close to the structure and naming listed in Section 2 above as permitted by the transaction protocol in use. Note: this does not impose any restriction on the user visible labeling of fields, just on their names as used in communication.

#### 3.1 Presentation of the Fields

There is no necessary implication as to the order or manner of presentation. Some merchants may wish to ask for more information, some less by omitting fields. Some merchants may ask for the information they want in one interaction or web page, others may ask for parts of the information at different times in multiple interactions or different web pages. For example, it is common to ask for "ship to" information earlier, so shipping cost can be computed, before the payment method information. Some merchants may require that all the information they request be provided while other make much information optional. Etc.

There is no way with Version 1.0 or 1.1 of ECML to indicate what fields the merchant considers mandatory. From the point of view of customer software, all fields are optional to complete. However, the merchant may give an error or re-present a request for information if some field it requires is not completed, just as it may if a field is completed in a manner it considers erroneous.

It is entirely up to the merchant when and which, if any, of the merchant to consumer fields it presents.

### 3.2 Methods and Flow of Setting the Fields

There are a variety of methods of communication possible between the customer and the merchant by which the merchant can indicate what fields they want that the consumer can provide. Probably the easiest to use for currently deployed software is as fields in an [HTML] form (see section 2.2). Other possibilities are to use the IOTP Authenticate transaction [RFC 2801], an [XML] exchange, or proprietary protocols.

User action or the appearance of the Ecom\_SchemaVersion field are examples of triggers that could be used to initiate a facility capable of filling in fields. Because some wallets may require user activation, there should be at least one user visible Ecom field on every page with any Ecom fields present that are to be filled in. It is also REQUIRED that the Ecom\_SchemaVersion field, which is usually a hidden field, be included on every web page that has any Ecom fields.

Because web pages can load very slowly, it may not be clear to an automated field fill-in function when it is finished filling in fields on a web page. For this reason, it is recommended that the Ecom\_SchemaVersion field be the last Ecom field on a web page.

Merchant requests for information can extend over several interactions or web pages. Without further provision, a facility could either require re-starting on each page or possibly violate or appear to violate privacy by continuing to fill in fields for pages beyond with end of the transaction with a particular merchant. For this reason the Ecom\_TransactionComplete field, which is normally hidden, is provided. It is recommended that it appear on the last interaction or web page involved in a transaction, just before an Ecom\_SchemaVersion field, so that multi-web-page automated field fill in logic could know when to stop if it chooses to check for this field.

### 3.3 HTML Example

An example HTML form might be as follows:

```
<HTML>
<HEAD>
<title> eCom Fields Example </title>
</HEAD>
<BODY>
  <FORM action="http://ecom.example.com" method="POST">
Please enter card information:
<p>Your name on the card
```

```

<INPUT type="text" name="Ecom_Payment_Card_Name" SIZE=40>
<br>The card number
<INPUT type="text" name="Ecom_Payment_Card_Number" SIZE=19>
<br>Expiration date (MM YY)
<INPUT type="text" name="Ecom_Payment_Card_ExpDate_Month" SIZE=2>
<INPUT type="text" name="Ecom_Payment_Card_ExpDate_Year" SIZE=4>
<INPUT type="hidden" name="Ecom_Payment_Card_Protocol">
<INPUT type="hidden" name="Ecom_SchemaVersion"
      value="http://www.ecml.org/version/1.1">
<br>
<INPUT type="submit" value="submit"> <INPUT type="reset">
</FORM>
</BODY>
</HTML>

```

After all of the pages are submitted, the merchant will reply with a confirmation page informing both the user and the wallet that the transaction is complete.

```

<HTML>
<HEAD>
<title> eCom Transaction Complete Example </title>
</HEAD>
<BODY>
  <FORM>
Thank you for your order.  It will be shipped in several days.
  <INPUT type="hidden" name="Ecom_Merchant" value="www.merchant.example">
  <INPUT type="hidden" name="Ecom_Processor"
        value="www.processor.example">
  <INPUT type="hidden" name="Ecom_Transaction_ID" value="EF123456">
  <INPUT type="hidden" name="Ecom_Transaction_Inquiry"
        value="http://www.merchant.example/cgi-bin/inquire?ID=EF123456">
  <INPUT type="hidden" name="Ecom_Transaction_Amount" value="789.00">
  <INPUT type="hidden" name="Ecom_Transaction_Currency" value="USD">
  <INPUT type="hidden" name="Ecom_Transaction_Date" value="July 14 2000">
  <INPUT type="hidden" name="Ecom_Transaction_Type" value="credit">
  <INPUT type="hidden" name="Ecom_Transaction_Signature"
        value="ig6rh4;;20dfna00s34hj10s--s-45j30-22z92l-frwds-85">
  <INPUT type="hidden" name="Ecom_TransactionComplete">
  <INPUT type="hidden" name="Ecom_SchemaVersion"
        value="http://www.ecml.org/version/1.1">
  </FORM>
</BODY>
</HTML>

```

#### 4. Security and Privacy Considerations

The information called for by many of these fields is sensitive and should be secured if being sent over the public Internet or through other channels where it can be observed. Mechanisms for such protection are not specified herein but channel encryption such as TLS/SSL [RFC 2246] or IPsec [RFC 2411] would be appropriate in many cases.

User control over release of such information is needed to protect the user's privacy.

A wallet that is installed on a shared or public terminal should be configurable such that the ECML memory of address and other contact information is fully disabled. This is vital to protect the privacy of library patrons, students, and customers using public terminals, and children who might, for example, use a form on a public terminal without realizing that their information is being stored.

When contact information is stored, the operator should have an option to protect the information with a password, without which the information might be unavailable, even to someone who has access to the file(s) in which it is being stored. This would also allow for a convenient method for multiple people to use their own ECML information from the same browser.

Any multi-web-page or other multi-aggregate field fill in or data provision mechanism should check for the Ecom\_TransactionComplete field and cease automated fill when it is encountered until fill is further authorized.

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## Appendix: Changes from ECML 1.0

ECML 1.0 is documented in [RFC 2706].

(1) Fields added for consumer to merchant transmission as listed below. \* indicated multiple values. Adding fields is a backward compatible change.

- Ecom\_\*\_Postal\_Company
- Ecom\_User\_ID
- Ecom\_User\_Password
- Ecom\_WalletID

(2) Change Ecom\_SchemaVersion field value to "http://www.ecml.org/version/1.1".

(3) Addition of XML DTD.

(4) Add "iotp", "echeck", "simcard", and "phoneid" as allowed tokens in Ecom\_Payment\_Card\_Protocol.

(5) Specify that a leading zero is permitted in day and month number fields.

(6) Change "Security Considerations" section to "Security and Privacy Considerations" and add material.

(7) Add internationalization material to HTML and XML subsections of Section 2.

(8) Enumerate HTML form elements that must be supported (Section 2.2) including SELECT.

(9) Add more credit card brand codes.

(10) Add fields for merchant to consumer transmissions as follows:

- Ecom\_Merchant
- Ecom\_Processor
- Ecom\_Transaction\_\*

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