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EngageOne Smart Bill
Universal Bill Format

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1 Overview

1.1 Purpose

This document provides an overview of Universal Bill Format (UBF) - the generic structure in which bill information must be formatted such that it may be pushed into the EngageOne Smart Bill solution and parsed appropriately. This action allows online user registration and the presentation of both online statements and invoices along with payment details, bill spending analyses, product offerings, and other customer account information.

In brief, billing files are pushed into the EngageOne Smart Bill solution and - in turn - the associated file data is transformed into a designated (and specific) bill format, which is necessary to produce digital bills.

The universal structure provides the following:

- A bill data format with limited explanation of the actual data.
- Data primarily determined by the code or XSLT that displays the data.

This document is intended for IT developers (or other IT professionals) with a solid knowledge of Java and XML schemas.

2 Common Data

Common data, generally, is data that is available on all bills. In addition, this data is the only strictly formatted data. Since this data will often be loaded into the database, the format of the data must be defined, firmly (i.e. date format, number, string). Common data includes information in the FileHeader, at the Bill Level, the Child Data, and information in the FileFooter.

2.1 FileHeader

The header element provides both a bill stream for registration and the payment group for online payments of all bills contained in the UBF file.

Data	Required?	Data Type	Description
billStream	Optional	xs:string	Identifies the bill type, such as *electric/water/telephone/credit card*. This ID is used for self registration, and each bill stream can have different rules for self registration.
paymentGroup	Optional	xs:string	A grouping that identifies which biller bank account (also referred to as a payment account) user payments are sent. Similar to an insurance company with distinct offerings (life/home/auto), different divisions have separate bank accounts and payment relationships. The payment group identifies which biller bank account is appropriate. When a user makes a payment, the EngageOne Digital Self Servicesolution looks at the payment group assigned to that bill stream, then calls the appropriate payment driver - as one payment driver will be configured for each payment group.

2.2 Bill Level

Each bill may have these segments (or pieces):

Data	Required?	Data Type	Description
version	Yes	xs:string	The bill iteration (or version). The version allows new bill data to be added, while also allowing the display of old bills.
bill id	Yes	xs:string	An ID that uniquely identifies a bill. This value may be used (as a differentiator, of sorts) if payments are required for particular invoices.
internal account number	Yes	xs:string	An internal ID that uniquely identifies the customer who has access to this bill. This may be the bill's account number. The bill format allows for two account numbers that reference the same account. While the internal account number is known to the biller, the external account number is presented to the user. For example, relative to a landline telephone bill, the account number may be the same as the telephone number; however, the account number used by the telephone company may be the telephone number followed by additional numbers (as this would distinguish the current account from the previous person that might have had the same telephone number). In many cases, however, the internal and external account numbers are the same.
external account number	Yes	xs:string	An ID that the user would recognize to identify the bill.
bill date	Yes	xs:date	The date of this bill.
bill due	Optional	xs:date	The "pay by" bill date.
final bill	Optional	xs:boolean	The last bill for this account id. If this element is not specified, it is assumed there will be more bills for this billing account.
account closed	Optional	xs:boolean	An account is considered closed when the biller has no intention of adding more charges to the bill; however, there may be an outstanding account balance.
disable payment	Optional	xs:boolean	This feature designates the state of the account when it has been closed and the customer does not owe any additional money to the biller.
amount due	Optional	xs:decimal	The amount of money the customer owes to the biller.
bill amount	Yes	xs:decimal	The invoice amount (or amount charged for a particular month), which does not include an outstanding balance from any previous month(s).
minimum due	Optional	xs:decimal	The slightest (or minimum) balance the customer must pay to the biller.
overdue	Optional	xs:decimal	Element designated for a past due payment. If this element is not specified, then the value is assumed to be 0.00.
language	Optional	xs:string	The language code for the bill.
layout	Optional	xs:string	Term used to specify a "stock" layout for the summary information. If billers establish a set of standard bill layouts for their operations (perhaps across multiple geographies), then they can use this field to specify which standard (or stock) layout is applied to these bills.
currency code	Optional	xs:string	The type of currency in which the account is displayed.
currency symbol	Optional	xs:string	The currency code for the account.
billing address	Optional	xs:string	The address of the customer billed.
external DocID	Optional	xs:string	Value typically used to reference the bill in an external system. This value typically is used for PDF versions of the bill that are stored in a document repository.

Data	Required?	Data Type	Description
flex	Optional	xs:string	Twenty "flex" (or flexible) fields are provided so deployment-specific information can be extracted and stored in the database for quick access. These are fields that the EngageOne Digital Self Service solutions do not require in the standard application and can be used, for example, when extending the application use cases (if the full EngageOne Digital Self Service solution was purchased or merely the SDK). Flex also may designate the fields required during user registration.
self registration	Optional	xs:string	Five self registration fields are available, allowing the bill to specify custom values the user must provide during the registration process. These fields may include the customer number or even a registration code printed on the bill.

2.3 Child Data

Each account can have one or more children associated with it. Additionally, children can have their own children. This concept allows a grouping of *assets* to infinity (∞), which should be great enough to handle any bill format.

Note: The most common use of a child id is specific to mobile telephones, where a family may have a single account with four mobile telephones (or child ids) attached to the same account.

The structured child data is much smaller than the account data. For a child, the only common data is as follows:

Data	Required?	Data Type	Description
child id	Yes	xs:string	A unique ID that identifies the child (in the bill). This should be constant across the bill history. Assuming the asset was not dropped, the child IDs in the last bill are the same as the ones in this bill.
name	Yes	xs:string	The name of the child that the customer would understand, such as a telephone number, service name, or a person's name.
total charges	Optional	xs:decimal	The total amount that this child added to the amount of the bill.
child closed	Optional	xs:boolean	A flag that can be set to mark the child, terminated. A terminated child will not appear on the next bill.
flex0 - flex20	Optional	xs:string	These fields provide extra values about the bill. These fields are not defined by the EngageOne Digital Self Service solution but can be used for application customizations.
language	Optional	xs:string	The language code for the child.
layout	Optional	xs:string	Term used to specify a "stock" layout for the child. If billers establish a set of standard bill layouts for operations (perhaps across multiple geographies), then they can use this field to specify which standard (or stock) layout to apply to these bills.
currency code	Optional	xs:string	The type of currency in which the child is displayed.
currency symbol	Optional	xs:string	The currency code for the child.

2.4 FileFooter

The footer element provides a summation of the bills in the file to verify that the file was transmitted to the system correctly.

Data	Required?	Data Type	Description
bills	Optional	xs:unsignedlong	Contains the number of bills in the UBF file.
amount	Optional	xs:decimal	Contains the total amount of all the bills by summing the */ubf:datafile/ubf:bill/ubf:info/ubf:billAmount* elements in the bill.
assets	Optional	xs:unsignedlong	Contains the total number of assets in the file or a count of the */ubf:datafile/ubf:bill/ubf:children/ubf:child* elements.

3 Examples

3.1 Sample Summary Bill

This example bill has neither a child account nor pageable data; it simply has two small tables of information that display to the customer with an amount due. Pageable data includes line items (which might continue for multiple pages and vary monthly); credit card charges and itemized telephone calls represent pageable data.

```
<bill>

<info>
  <billId>abc123</billId>
  <internalAccountNo>xyz25</internalAccountNo>
  <externalAccountNo>XYZ</externalAccountNo>
  <billDate>2008-10-31</billDate>
  <billAmount>177.80</billAmount>
</info>

<summary>
  <display>
      <layout>summary_layout_1</layout>
  </display>

  <displayGroup id="first" layout="table_2_col">
    <name type="id">service.charges.label</name>
    <row>
      <text>Charge for 25 Foos</text>
      <text>$29.95</text>
    </row>
    <row>
      <text>Bar Monthly Service</text>
      <text>$17.95</text>
    </row>
    <row layout="footer">>
     <text>Total</text>
     <text>$47.90</text>
   </row>
  </displayGroup>

  <displayGroup id="second" layout="table_3_col">
    <name type="id">one.time.charge.label</name>
    <row>
      <text>5 Widgets</text>
      <text>10.15.2008</text>
      <text>$104.23</text>
    </row>
    <row>
      <text>3 Dodads</text>
      <text>10.08.2008</text>
      <text>$25.67</text>
    </row>
    <row layout="footer">
     <text>Total</text>
     <text></text>
     <text>$129.90</text>
   </row>
  </displayGroup>

</summary>
</bill>
```

Account: XYZ **Date:** 10.31.2008

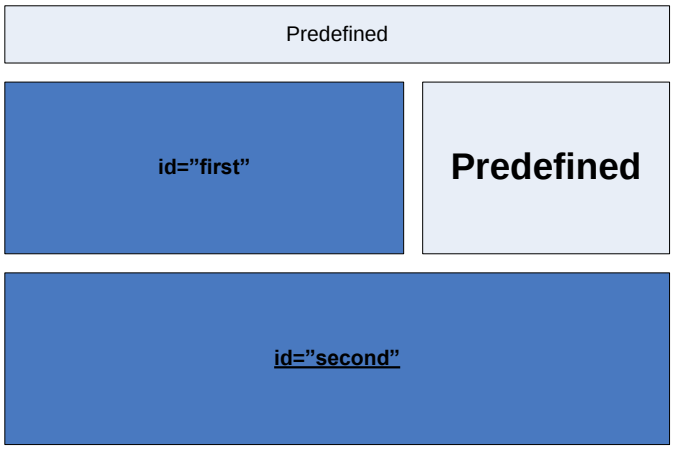
Service Charges	
Charge for 25 Foos	$29.95
Bar Monthly Service	$17.95
Total	**$47.90**

Please Pay

$177.80

One Time Charges		
5 Widgets	10.15.2008	$104.23
3 Dodads	10.08.2008	$25.67
Total		**$129.90**

In the example above, the XSLT uses generic rules to display the bill. The icon points to the "summary_layout_1" key, which controls the box layout:



The display engine relies on the content in dark rectangles. The content in the light rectangles is taken from "common" data. The hope is to build solutions for customers as well as a library of these summary layouts, reusing them when possible.

The ⬇ icons point to the "table_2_col" and "table_3_col" keys, which inform the display engine how to display the groups. In the example, this is as a two-column and three-column table:

Service Charges	
Charge for 25 Foos	$29.95
Bar Monthly Service	$17.95
Total	**$47.90**

Over time, the intent is to build a library of group displays, perhaps introducing a "fancy_table_2_col" which displays a two-column table where the total is enclosed in a box.

3.2 Sample Data

You also can have a bill that has no *summary* information but plunges (or jumps) directly into line item details.

```
<bill>
 <info>
    ..............................
 </info>
 <data>
   <dataGroup id="E101" layout="basic">
     <name>Elemental Charges</name>

     <header layout="header_1">
       <displayGroup layout="para">
         <row>
           <text>These are all your elemental charges.</text>
         </row>
       </displayGroup>
     </header>

     <contents>

       <header>
         <column>Element</column>
         <column>Amount($)</column>
       </header>

       <definition>
         <string>10</string>
         <number>5</number>
       </definition>

       <rows>
Hydrogen  10.00
Helium    20.00
Lithium   30.00
Oxygen    40.00
Fluorine  50.00
Xenon     60.00
       </rows>

     </contents>

     <footer>
       <displayGroup layout="table_2_col">
         <name type="id">total.label</name>
         <row>
           <text>Other Nonmetals</text>
           <text>2</text>
         </row>
         <row>
           <text>Halogens</text>
           <text>1</text>
         </row>
         <row>
           <text>Nobel gases</text>
           <text>2</text>
         </row>
         <row>
           <text>Alkali metals</text>
           <text>1</text>
         </row>
       </displayGroup>
     </footer>

   </dataGroup>
 </data>
</bill>
```

Elemental Charges

These are all your elemental charges.

Page 1 of 1

Element	Amount($)
Hydrogen	10.00
Helium	20.00
Lithium	30.00
Oxygen	40.00
Fluorine	50.00
Xenon	60.00

Page 1 of 1

Totals

Other Nonmetals	2
Halogens	1
Nobel gases	2
Alkali metals	1

The line items that display in a bill are contained in the data element. The line items should be grouped by category, and each category should be placed in a new dataGroup element. As such, a bill may have multiple dataGroup elements to display all categories.

The dataGroup element has header and footer elements. These elements allow static data to display above and below the line items. The content of these two elements is the same as the summary information.

The actual line items are contained in the contents element. The contents element is broken into three sections. The ⬅ icon points to the header element, which lists the column headers that display to the user. The ⬅ icon points to the definition element, which defines the columns. The data is provided in fixed record format for fast display such that the definition element describes the data type of the column along with the size of the column and whether or not the column can be sorted. Finally, the ⬅ icon points to the data in fixed record format.

3.3 Children Sample

Each bill can have child objects. Child objects are a logical grouping of charges that are an addition to the bill total. These child objects may be individual contracts, telephones, people, or services. In addition, these child objects can have children. This concept may continue to infinity (∞) or until you run out of disk space.

```
<bill>

<info>
  <billId>abc123</billId>
  <internalAccountNo>xyz25</internalAccountNo>
  <externalAccountNo>XYZ</externalAccountNo>
  <billDate>2008-10-31</billDate>
  <billAmount>495.00</billAmount>
</info>

<summary>
  <display>
      <layout>summary_layout_2</layout>
  </display>

  <displayGroup id="first" layout="table_2_col">
    <name type="id">contract.list.label</name>

    <row><text target="1111">1111-1111</text><text>$11.00</text></row>
    <row><text target="2222">2222-2222</text><text>$22.00</text></row>
    <row><text target="3333">3333-3333</text><text>$33.00</text></row>
    <row><text target="4444">4444-4444</text><text>$44.00</text></row>
    <row><text target="5555">5555-5555</text><text>$55.00</text></row>
    <row><text target="6666">6666-6666</text><text>$66.00</text></row>
    <row><text target="7777">7777-7777</text><text>$77.00</text></row>
    <row><text target="8888">8888-8888</text><text>$88.00</text></row>
    <row><text target="9999">9999-9999</text><text>$99.00</text></row>

  </displayGroup>


</summary>
</bill>
```

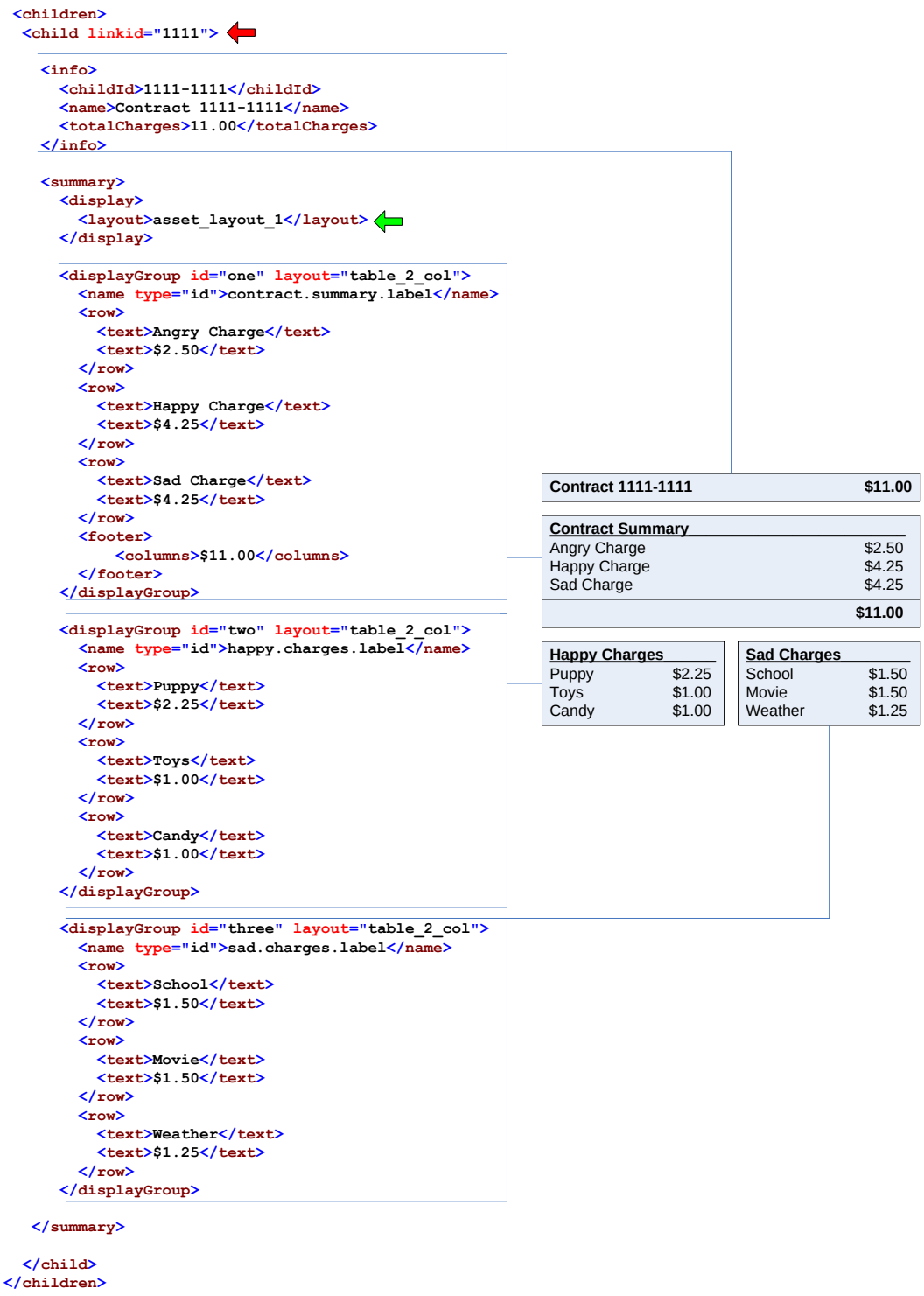
Account: XYZ **Date:** 10.31.2008

Contracts	
1111-1111	$11.00
2222-2222	$22.00
3333-3333	$33.00
4444-4444	$44.00
5555-5555	$55.00
6666-6666	$66.00
7777-7777	$77.00
8888-8888	$88.00
9999-9999	$99.00

Please Pay **$495.00**

The example above is similar to the first summary; however, it is using “summary_layout_2” which only displays one group. In addition, the table’s first column contains links, designated by the addition of the “target” attribute. These target IDs point to various child elements.

The child object, basically, is a copy of the structure used for the bill; however, it is enclosed in a child element and has a reduced set of common information.




```
<children>
 <child linkid="1111">
   <info>
     <childId>1111-1111</childId>
     <name>Contract 1111-1111</name>
     <totalCharges>11.00</totalCharges>
   </info>

   <summary>
     <display>
       <layout>asset_layout_1</layout>
     </display>

     <displayGroup id="one" layout="table_2_col">
       <name type="id">contract.summary.label</name>
       <row>
         <text>Angry Charge</text>
         <text>$2.50</text>
       </row>
       <row>
         <text>Happy Charge</text>
         <text>$4.25</text>
       </row>
       <row>
         <text>Sad Charge</text>
         <text>$4.25</text>
       </row>
       <footer>
           <columns>$11.00</columns>
       </footer>
     </displayGroup>

     <displayGroup id="two" layout="table_2_col">
       <name type="id">happy.charges.label</name>
       <row>
         <text>Puppy</text>
         <text>$2.25</text>
       </row>
       <row>
         <text>Toys</text>
         <text>$1.00</text>
       </row>
       <row>
         <text>Candy</text>
         <text>$1.00</text>
       </row>
     </displayGroup>

     <displayGroup id="three" layout="table_2_col">
       <name type="id">sad.charges.label</name>
       <row>
         <text>School</text>
         <text>$1.50</text>
       </row>
       <row>
         <text>Movie</text>
         <text>$1.50</text>
       </row>
       <row>
         <text>Weather</text>
         <text>$1.25</text>
       </row>
     </displayGroup>

   </summary>

 </child>
</children>
```

The example above is similar to the bill XML. This example only has a child summary. It also could be simply data or have summary and data information. The ⇦ points to the linking ID that allows the bill summary to reference this child, while the ⇦ icon points to the layout tag for the child summary.

4 Localization and Help Text

In all the displayGroup elements pictured above, the child name and text elements both can have an id or a help attribute. These attributes are processed by the XSLT at presentment time (when the bill is presented to the online user) to perform localization and/or in-bill help.

The following is an example of a display group using both the id and help attributes:

```
<displayGroup id="first" layout="table_2_col">
    <name type="id" help="contract.help">contract.list.label</name>
    <row>
        <text type="text" help="phone.number.help">1111-1111</text>
        <text type="amount" help="phone.amount.help">56.78</text>
    </row>
</displayGroup>
```

When this XML is encountered by the XSLT, it will be rendered in the “table_2_col” layout - which is however the XSLT/HTML developer defined it. Next, the name element is considered. This is usually a header for this table. Since the type attribute of the element equals “id”, a localization lookup is performed to locate the correct text to display to the user based on his preferred language.

In the past, including inline help for the bill was performed based on the id parameter, which means it was performing double duty - both for localization and for in-bill help. The theory was that when raw text displays, the bill does not know any context around that information so help cannot display. Therefore, inline help only displays for specific values known in advance.

In the latest UBF version, there is the addition of the help attribute. This attribute contains an ID to locate the help text. As such, multiple localization keys can reuse the same help text, or non-localized values can have in-bill help attached. In the example above, both the name and the two text values displayed in the table have help IDs. Therefore, in-bill help displays next to each one. Normally, in-bill help is presented to the user with an icon after the textual entry that displays a “pop-in” when the user clicks it.

Displaying in-bill help is controlled entirely by the presentment templates. As such, you can customize the help as you prefer as well as localize it based either on the language of the bill or on the user’s session.

5 Archive

5.1 Overview

The UBF format can handle additional documents that are associated with bills, such as documents for download or documents that actually display the bill (PDFs, PNGs). When you create a UBF file with associated documents, the UBF file and all documents must be compressed into a ZIP archive.

There only can be one UBF file in the archive and any number of additional documents. There should be no directories in the archive. If an additional document is placed in a directory (and in the archive), the UBF processor will not be able to locate it.

The additional documents are referenced using the associatedDocs element. Multiple bills can reference the same document; however, this is not recommended. Each document in the archive should have a unique name.

5.2 Example

5.2.1 Archive Contents

- bill.ubf
- bill_1.png
- bill_1.pdf
- bill_2.png
- bill_2.pdf

5.2.2 Content of bill.ubf

```
<datafile>
    <bill version="1">
        <info>
                <billId>abc123</billId>
                <internalAccountNo>xyz25</internalAccountNo>
                <externalAccountNo>XYZ</externalAccountNo>
                <billDate>2011-01-19</billDate>
                <billAmount>177.80</billAmount>
        </info>
        <associatedDocs>
            <document linked="bill_image" content="image/png" filename="bill_1.png"/>
            <document linked="bill_pdf" content="application/pdf" filename="bill_1.pdf"/>
        </associatedDocs>
    </bill>
    <bill version="1">
        <info>
                <billId>mno123</billId>
                <internalAccountNo>mno27</internalAccountNo>
                <externalAccountNo>MNO</externalAccountNo>
                <billDate>2011-01-19</billDate>
                <billAmount>56.12</billAmount>
        </info>
        <associatedDocs>
            <document linked="bill_image" content="image/png" filename="bill_2.png"/>
            <document linked="bill_pdf" content="application/pdf" filename="bill_2.pdf"/>
        </associatedDocs>
    </bill>
</datafile>
```

Digital Self Service (DSS) is provided with important bill information (such as the bill date and bill amount) to enable payment, while the bill content is provided in binary form for deployment.

6 Bill Element Reference

6.1 bill

This element holds a single bill for a billing account. This element should encompass all data that would be sent to a customer for a single bill.

6.1.1 Attributes

Name	Required?	Type	Description
version	Yes	xs:string	An iteration number (or version number) for the bill. This value maps to a set of XSLT files for displaying this bill. This value would change if a new look/feel is released; new bills should be displayed with the new look/feel, while the old bills should not change. This also can change if the XML elements in the bill change. As such, new XSLTs can be used for the new bills, while the old bills can be handled by the previous XSLTs.

Name	Required?	Type	Description
linkId	No	xs:string	This value only needs to be defined if a link needs to be embedded in the bill to jump back to the "bill" level which, in most cases, would be the bill summary page. This value should be unique among all of the linkIds defined for this bill. This value does not have to be unique among different bills.

6.1.2 Children

Name	Min	Max	Type	Description
info (bfHdr)	1	1	Element	This element contains the "common" structured data that can be loaded into the database for rapid access.
display (billdisplay)	0	1	Element	Specifies the layout and language of the bill.
currency (billcurrency)	0	1	Element	Specifies the currency and currency symbol for the bill.
summary (billsummary)	0	1	Element	Contains any static summary information to display to the user. This could be used to display information, such as the last payment amount, total amount of new charges, total amount of outstanding charges, or a total bill amount. This element is mutually exclusive with the summary-XML element.
summary-xml	0	1	Element	This element allows for free-form XML to be inserted into the summary section of the UBF. Custom templates would then need to be created to decode this special XML. There is no standard for the XML in this section; it can be whatever is required for the application.
children (billchildren)	0	1	Element	This element contains child elements, such as individual telephones, contracts, or services on the account.
data (data)	0	1	Element	Provides large lists of categorized item charges. The data here traditionally is filterable, searchable, and can be sorted. This element should be used only to display large amounts of similar charges, such as individual usage charges (telephone calls or data usage).
associatedDocs (assocDocs)	0	1	Element	This element references files external from this UBF file and, primarily, is used when the bill data is provided in the UBF (but in PDF or image form).

6.2 Bill/fileHeader

The header element provides both a bill stream for registration and the payment group for online payments of all bills contained in the UBF file.

6.2.1 Attributes

None.

6.2.2 Children

Data	Required?	Data Type	Description
billStream	Optional	xs:string	Identifies the bill type, such as *electric/water/telephone/credit card*. This ID is used for self registration, and each bill stream can have different rules for self registration.

Data	Required?	Data Type	Description
paymentGroup	Optional	xs:string	A grouping that identifies which biller bank account (also referred to as a payment account) user payments are sent. Similar to an insurance company with distinct offerings (life/home/auto), different divisions have separate bank accounts and payment relationships. The payment group identifies which biller bank account is appropriate. When a user makes a payment, the EngageOne Digital Self Service solution looks at the payment group assigned to that bill stream, then calls the appropriate payment driver - as one payment driver will be configured for each payment group.

6.3 bill/info

This element holds structured data (such as payment information) that may be used by more than simply bill presentment. As such, the EngageOne Digital Self Service solution must be able to decode the data here to perform operations on it. This section contains common information that is on most (if not all) bills; this information includes the amount due, payment date, and bill date.

6.3.1 Attributes

None.

6.3.2 Children

Name	Required?	Type	Description
billId	Yes	xs:string	A unique number to identify this particular bill that is used if payments are slated to be connected to a particular bill. In addition, this value should be unique to this bill relative to the other bills in the system.
internalAccountNo	Yes	xs:string	A value that uniquely identifies this bill series. This value may be a customer number or an account number. This value only is used internally and is not displayed to the user.
externalAccountNo	Yes	xs:string	A value that (in general) uniquely identifies this bill series. This value displays to the user. If users voice concerns about their accounts, this value represents the number they likely use to identify themselves. This *may* be the same value as internalAccountNo. Since this value only is used for display, it does not have to be unique.
billDate	Yes	xs:date	The date the bill was issued.
dueDate	No	xs:date	If the biller expects a payment in response to this bill, then this is the date after which the customer is considered overdue (and, therefore, the customer has failed to pay). This value may be omitted if there is neither a balance owed nor a due date.
finalBill	No	xs:boolean	If this element is not specified (or present), the value is assumed to be FALSE. This value should be TRUE if this is the final bill for a customer and no additional bills are expected. If this value is TRUE, then often the accountClosed element also will be set to TRUE.
accountClosed	No	xs:boolean	If this element is not specified (or present), the value is assumed to be FALSE. This value should be TRUE when there will be no more charges to the account. This value should be deleted from the online application after a configurable delay (one month/ three months/six months).

Name	Required?	Type	Description
disablePayment	No	xs:boolean	If this element is not specified (or present), the value is assumed to be FALSE. This value should be set to TRUE to disable payments for the bill. Most often, this would occur if the account does not have an outstanding balance or the account has been closed.
amountDue	No	xs:decimal	If this element is not specified (or present), the value is assumed to be 0.00. This is the amount owed on the bill. The EngageOne Digital Self Service solution will prompt the user to pay this amount.
billAmount	Yes	xs:decimal	The amount of the bill. The amount due for the account can be different from the amount on the bill. This may occur if a customer failed to pay the last bill, paid it late, made a partial payment, or overpaid.
minimumDue	No	xs:decimal	The amount the user must pay to avoid late charges or fees. If this element is not included, the amountDue value is assumed to be the minimum due as well.
overdue	No	xs:boolean	If this element is not specified (or present), then the value is assumed to be FALSE. This value should be TRUE if the account is in an alert state due to nonpayment - allowing the EngageOne Digital Self Service solution to encourage users to pay their bills.
externalDocId	No	xs:string	Often times, PDF or other bill versions may be stored in external document repositories. This value can be populated with an ID that references the bill in an external system. DSS then can use this value to retrieve the document from that external system and provide it to the user.
flex1 – flex20	No	xs:string	These 20 fields are used for DSS solution customizations. If a biller application requires additional functionality and new values need to be stored with the bill, then these fields can be populated. The DSS bill loader automatically supplies these values to the database.
selfReg0 - selfReg4	No	xs:string	These five fields can contain custom information that the user must provide during the registration process.

6.4 bill/display

This element holds display information (such as language and the overall layout) at the bill level.

6.4.1 Attributes

None.

6.4.2 Children

Name	Required?	Type	Description
language	No	xs:string	Default language for the bill. This can be changed for the summary pages (or the children), providing the EngageOne Digital Self Service solution with an idea of what language it should present to the user.
layout	No	xs:string	Value that provides an overall layout for the bill.

6.5 bill/currency

This element contains information about the bill summary currency. Child records can have their own currency; however, at the bill summary level, this element controls how the currencies display. If the child accounts do not specify a currency, then this currency code will be used.

If this element is not specified (or included), then the bill is assumed to be in the default currency for the application.

6.5.1 Attributes

None.

6.5.2 Children

Name	Required?	Type	Description
code	Yes	xs:string	The 3-character ISO 4217 currency code for the amounts in the bill.
symbol	Yes	xs:string	The currency symbol to use when displaying currencies.

6.6 bill/summary

This element contains tables of bill summary data, which can include various charge rollups or simply a list of charges to the account. The purpose of the summary is to provide customers with an overview of the amount owed on the bill and to inform them of where they may seek additional information.

6.6.1 Attributes

None.

6.6.2 Children

Name	Min	Max	Type	Description
display (billsummarydisplay)	0	1	Element	This element provides global display information for the summary, such as layout and language details.
displayGroup (displayGroup)	1	∞	Element	This element contains all the data to display along with rules to help display the data. The (∞) symbol represents infinity.

6.7 bill/summary/display

This element contains the language and layout for the summary. If the language is not specified, the language for the bill is used. If the language for the bill is not specified, then the default language for the application is used.

6.7.1 Attributes

None.

6.7.2 Children

Name	Min	Max	Type	Description
language	0	1	xs:string	Default language for the bill summary. If this element is not specified (or present), then the language for the bill or the application is assumed.
layout	0	1	xs:string	Value that provides the layout identification for the summary.

6.8 bill/children

This element contains one or more child elements. Each child element is an asset or contract associated with this bill. For the bill, these charges may include assets such as cell phones, contracts such as loans, or a service such as cable or telephone.

6.8.1 Attributes

None.

6.8.2 Children

Name	Required?	Type	Description
child (child)	Yes	Element	There can be one or more child elements. Each child element is an asset or contract associated with the bill.

6.9 bill/fileFooter

The footer element provides a summation of the bills in the file, thus verifying that the file was transmitted to the system correctly.

6.9.1 Attributes

None.

6.9.2 Children

Data	Required?	Type	Description
bills	Optional	xs:unsignedlong	Contains the number of bills in the UBF file.
amount	Optional	xs:decimal	Contains the total amount of all the bills by summing the */ubf:datafile/ubf:bill/ubf:info/ubf:billAmount* elements in the bill.
assets	Optional	xs:unsignedlong	Contains the total number of assets in the file or a count of the */ubf:datafile/ubf:bill/ubf:children/ubf:child* elements.

7 Child Element Reference

7.1 child

This element represents a “child” collection of charges. For a bill, these charges may include assets such as cell phones, contracts such as loans, or a service such as cable or telephone. In addition, this may include a child of a child; therefore, the bill may have a collection of contracts, and the contracts actually have a collection of telephones, loans, or services. The EngageOne Digital Self Service solution does not include any limitations specific to the use of these child objects.

7.1.1 Attributes

Name	Required?	Type	Description
linkId	No	xs:string	With the EngageOne Digital Self Service solution, bill data is able to dynamically reference other pieces of the bill. This action allows the bill display to provide links to jump to other portions of the bill in which the user may have interest. This is the ID for jumping to the summary information for this child. This value must be unique throughout this bill.

7.1.2 Children

Name	Min	Max	Type	Description
info (childInfo)	1	1	Element	Contains the "common" structured data that loads into the database for rapid access.
display (childDisplay)	0	1	Element	Specifies the layout and language of this child.
currency (childSummary)	0	1	Element	Specifies the currency and currency symbol of this child. As such, if a bill has child objects for different countries or charges with different currencies, that information (or facts) can be shown in the EngageOne Digital Self Service solution.
summary childSummary	0	1	Element	Contains any static summary information to display to the user for this child. This traditionally displays a summary for this child. The information displayed might be a summary of usage charges or notices (to include information about new features or expired functionality) specific to this child element.
summary-xml	0	1	Element	This element is mutually exclusive with the summary element and specifies the child summary in a raw XML format. The element content is inserted into the database as-is, and you would have to create templates to render the XML (relative to display) - correctly.
children (childChildren)	0	1	Element	Contains child elements to this child element, thus allowing the bill to be divided to infinity (∞).
data (data)	0	1	Element	Provides large lists of categorized item charges. The data here traditionally is filterable, searchable, and can be sorted. This data is specific to large amounts of similar charges - usage charges, for example.

7.2 child/info

7.2.1 Attributes

Name	Required?	Type	Description
id	Yes	xs:string	An ID that uniquely identifies this child across multiple bills. If the user wants to view this child for a previous bill, this field enables the application to switch to it - quickly.

7.2.2 Children

Name	Min	Max	Type	Description
name (childInfoName)	1	1	Element	Contains a string to display to the user to identify this child (such as a telephone number, name associated with the contract, or other number/text).
totalCharges	0	1	xs:decimal	Optional, this element provides the amount this child contributes to the overall bill amount.
childClosed	0	1	xs:boolean	Often child objects can be closed or terminated, while the overall account continues to exist. This element identifies when the child has been closed. If this element is not specified (or present), it is assumed to be FALSE - in which case, the child element will exist in the next bill.
flex1 – flex20	0	1	xs:string	These 20 fields are used for DSS solution customizations. If a biller application requires additional functionality and new values need to be stored with the bill, then these fields can be populated. The DSS bill loader automatically supplies these values to the database.

7.3 child/display

This element holds the language and layout display code for this child. If the language is not specified, the language for the bill is used. If the language for the bill is not specified, then the default language for the application is used.

7.3.1 Attributes

None.

7.3.2 Children

Name	Required?	Type	Description
language	No	xs:string	The default language for the child. If this element is not specified (or present), then the language for the bill or the application is assumed.
layout	No	xs:string	This value provides an overall layout for the child.

7.4 child/summary

This element contains tables of child summary data, which can include various charge rollups or simply a list of charges to the child. The purpose of the summary is to provide customers with an overview of the child object costs and to inform them of where they may seek additional information.

7.4.1 Attributes

None.

7.4.2 Children

Name	Min	Max	Type	Description
display (childSummaryDisplay)	0	1	Element	Provides global display information for the summary, such as layout and language.
displayGroup (displayGroup)	1	∞	Element	This element contains all the data to display along with the rules to help display this data. The (∞) symbol represents infinity.

7.5 child/summary/display

This element holds the language and layout for the child summary. If the language is not specified, then the language for the bill is used. If the language for the bill is not specified, then the default language for the application is used.

7.5.1 Attributes

None.

7.5.2 Children

Name	Min	Max	Type	Description
language	0	1	xs:string	The default language for the child summary. If this element is not specified (or present), then the language for the bill or the application is assumed.
layout	0	1	xs:string	This value provides the layout identification for the summary.

7.6 child/currency

This element contains information about the currency used for this child. If this value is not specified, then the currency value for the bill or application is assumed. Using this feature allows different children for a bill to be in different currencies.

7.6.1 Attributes

None.

7.6.2 Children

Name	Required?	Type	Description
code	Yes	xs:string	This is the 3-character ISO 4217 currency code for the amounts in this child.
symbol	Yes	xs:string	The currency symbol to use when displaying currencies.

7.7 child/children

This element contains one or more child elements. As such, children can have children themselves, and those children can have children.

7.7.1 Attributes

None.

7.7.2 Children

Name	Min	Max	Type	Description
child (child)	1	∞	Element	There can be one or more child elements. Each child element is an asset or contract associated with this child. For the bill, these charges may include assets such as cell phones, contracts such as loans, or a service such as cable or telephone. The (∞) symbol represents infinity.

7.8 child/info/name

This element provides a name for this child. This value may be an ID that is looked up from a properties file that displays to the user.

7.8.1 Attributes

Name	Required?	Type	Description
type	No	xs:string	This value either can be “id” (to specify that the element value is actually an ID that should be looked up in the translation files) or “text” (to specify that the element value should be displayed to the user - unmodified). If this value is not specified (or present), then “text” is assumed.

7.8.2 Children

None.

8 Data Elements

8.1 data

The data element is simply a container for one or more dataGroups. The dataGroup elements actually contain the data that displays to the user.

8.1.1 Attributes

None.

8.1.2 Children

Name	Min	Max	Type	Description
dataGroup (dataDataGroup)	1	∞	Element	This element holds the data. There should be one instance of this element for each type or category of data. The (∞) symbol represents infinity.

8.2 data/dataGroup

This element contains the display information for a category of charges. These elements only need to be used if there can be a large number of rows. Data displayed here can be filtered, searched, and sorted. It is assumed that the charges have multiple fields, such as the description, date, time, amount, or duration. The EngageOne Digital Self Service solution does not restrict the type or number of fields.

Charges should be grouped by type and by the additional fields. If charge type 1 has fields A, B, C, and D (and charge type 2 has fields A, C, X, and Y), then both charge types should be in their own dataGroup element. Local and long distance charges on a telephone bill represent an example of this concept. Since the method of charging is different for the two types, the charges display in different dataGroups.

8.2.1 Attributes

Name	Required?	Type	Description
id	Yes	xs:string	An internal id for this charge type. This value must be unique among this group of dataGroup elements, but it does not need to be unique across bills or bill dates.
layout	No	xs:string	A layout string to control how this data group displays to the user.
linkId	No	xs:string	A value which can be set to allow other portions of the bill to link to this charge type. The value must be unique across this bill only.

8.2.2 Children

Name	Min	Max	Type	Description
name (dataDataGroupName)	1	1	Element	The element that holds the name of this charge group. This is a value that displays to the user (if the user is browsing the bill and wants to view these charges).
header (dataDataGroupContentsHeader)	0	1	Element	An element that displays information before the data table.
contents (dataDataGroupContents)	0	1	Element	An element that contains all the data to display to the user; data that the user can sort, page, filter, and search.

Name	Min	Max	Type	Description
rawContents	0	1	Element	An element mutually exclusive with the contents element, allowing for the insertion of call details in a free form XML format. The format of this element may be determined by you, the developer; its contents will be inserted into the database and made available for display as-is. You then would need to create templates to process the contents correctly.
footer(8.13)	0	1	Element	An element that displays information after the data table.

8.3 data/dataGroup/name

This element holds the name of this data group. These values, generally, are available in a list that displays to the user, allowing the user to access (or jump) to these charges when browsing the bill.

8.3.1 Attributes

Name	Required?	Type	Description
type	No	xs:string	This value either can be "id" (to specify that the element value is actually an ID that should be looked up in the translation files) or "text" (to specify that the element value should be displayed to the user - unmodified). If this value is not specified (or present), then "text" is assumed.

8.3.2 Children

None.

8.4 data/dataGroup/header

This element displays static data before the data table (similar to the summary information elsewhere in the bill), which provides a quick summary of this data type or a description of what charges display.

8.4.1 Attributes

Name	Required?	Type	Description
layout	No	xs:string	This data can be displayed with its own sub layout.

8.4.2 Children

Name	Min	Max	Type	Description
displayGroup (displayGroup)	1	∞	Element	These elements hold the static data to display. The (∞) symbol represents infinity.

8.5 data/dataGroup/contents

This element contains both the data and an internal data description. The data is actually stored in a non- XML format that is easy to parse for display and contains a child that describes the format.

8.5.1 Attributes

None.

8.5.2 Children

Name	Min	Max	Type	Description
header (dataDataGroupContentsHeader)	1	1	Element	The element that defines the text that displays in the table column header.

Name	Min	Max	Type	Description
definition (dataDataGroupContentsDefinition)	1	1	Element	The element that defines the data in the table. The EngageOne Digital Self Service solution uses this information to decode the rows element.
rows (dataDataGroupContentsRow)	1	1	Element	The element that contains the data to display in the table.

8.6 data/dataGroup/contents/header

This element defines the header of the table that displays the data.

8.6.1 Attributes

None.

8.6.2 Children

Name	Min	Max	Type	Description
column (dataDataGroupContentsHeader)	1	∞	Element	An element for which there must be one instance for each column in the data table. The (∞) symbol represents infinity.

8.7 data/dataGroup/contents/header/column

This element defines the header for one column in the data table. This element contains the text or ID of the information that displays to the user.

8.7.1 Attributes

Name	Required?	Type	Description
type	No	xs:string	This value either can be “id” (to specify that the element value is actually an ID that should be looked up in the I18N property files) or “text” (to specify that the element value should be displayed to the user). If this attribute is not specified (or present), then “text” is assumed.
layout	No	xs:string	This attribute allows you to perform basic formatting and, primarily, is used for left and right alignment of the header text.

8.7.2 Children

None.

8.8 data/dataGroup/contents/definition

This element contains multiple elements that define the data contained in the rows element. The data contained in the rows element is in fixed record format so - at the very least - the child elements (of this element) define the record sizes. The order of the children is significant, as the first child references the first column in the table.

8.8.1 Attributes

None.

8.8.2 Children

Name	Min	Max	Type	Description
string (dataDataGroupContentsDefinitionString)	1	∞	Element	The element that identifies a textual column in the data. The (∞) symbol represents infinity.
number (dataDataGroupContentsDefinitionNumber)	1	∞	Element	The element that identifies a numeric column in the data. The (∞) symbol represents infinity.
datetime (dataDataGroupContentsDefinitionDatetime)	1	∞	Element	The element that identifies a date or time column in the data, which also supports columns that display a date and time. The (∞) symbol represents infinity.

8.9 data/dataGroup/contents/definition/string

This element contains a positive integer, which is the number of characters for this data object in the rows element. This element also identifies the data as a string field. The string identification only is used for sorting; therefore, if none of the columns can be sorted, then all of them can be defined as a string.

8.9.1 Attributes

Name	Required?	Type	Description
sortable	No	xs:boolean	This value can be TRUE to indicate that the column can be sorted by the user. If this attribute is not specified (or present), it is assumed the column is sortable.
layout	No	xs:string	This data, primarily used for left and right alignment, can be displayed with its own sub layout.

8.9.2 Children

None.

8.10 data/dataGroup/contents/definition/number

This element contains a positive integer, which is the number of characters for this data object in the rows element. This element also identifies the data as a numeric field. The numeric identification is used only for sorting.

8.10.1 Attributes

Name	Required?	Type	Description
sortable	No	xs:boolean	This value can be TRUE to indicate that the column can be sorted by the user. If this attribute is not specified (or present), it is assumed the column is sortable.
layout	No	xs:string	This data, primarily used for left and right alignment, can be displayed with its own sub layout.

8.10.2 Children

None.

8.11 data/dataGroup/contents/definition/datetime

This element contains a positive integer, which is the number of characters for this data object in the rows element. This element also identifies the data as a date or time field, which is used only if the column can be sorted.

8.11.1 Attributes

Name	Required?	Type	Description
sortable	No	xs:boolean	This value can be TRUE to indicate that the column can be sorted by the user. If this attribute is not specified, it is assumed the column is sortable.
layout	No	xs:string	This data, primarily used for left and right alignment, can be displayed with its own sub layout.
format	Yes	xs:string	This is a description of the format of the date and/or time field in this column, which is needed to sort the column correctly.

8.11.2 Children

None.

8.12 data/dataGroup/contents/rows

This element contains the actual data that displays to the user. The format of this data is defined by the definition element. In addition, the contents of this element are a block of characters rather than XML (to increase extraction and display).

8.12.1 Attributes

None.

8.12.2 Children

None.

8.13 data/dataGroup/footer

This element displays static data after the data table (similar to the summary information elsewhere in the bill), which provides a quick summary of this data type or a description of the charges displayed.

8.13.1 Attributes

Name	Required?	Type	Description
layout	No	xs:string	This data can be displayed with its own sub layout.

8.13.2 Children

Name	Min	Max	Type	Description
displayGroup (displayGroupP25)	1	∞	Element	These elements hold the static data to display. The (∞) symbol represents infinity.

9 displayGroup Elements

9.1 displayGroup

A display group displays a *table* of data. This data, while held in a tabular form, is not necessarily displayed in tabular form. You easily can store multiple paragraphs of text in a table with one column, and each row is a new paragraph. The rules for converting the data from the table form into a set of paragraphs are trivial.

9.1.1 Attributes

Name	Required?	Type	Description
id	No	xs:string	This is an ID for this display group. When using layouts in the parent element, this value places the data in the appropriate location - correctly. Not all layouts require IDs; therefore, this element is optional.
layout	No	xs:string	This value controls how the data contained in this element displays.
linkId	No	xs:string	If defined, then other portions of the bill can link to this data directly and allow the user to access this information (or jump here).

Children

Name	Min	Max	Type	Description
name (displayGroupName)	0	1	Element	Provides an optional name for the data; a name which displays contingent upon the layout.
row (displayGroupRow)	1	∞	Element	The rows of data slated for display. The (∞) symbol represents infinity.

9.2 displayGroup/name

This element provides a name for this data. This value actually may be an ID that is looked up from a properties file that displays to the user. This value may (or may not) be needed, contingent upon the layout for this displayGroup

9.2.1 Attributes

Name	Required?	Type	Description
type	No	xs:string	This value either can be “id” (to specify that the element value is actually an ID that should be looked up in the translation files) or “text” (to specify that the element value should be displayed to the user - unmodified). If this value is not specified (or present), then “text” is assumed.

9.2.2 Children

None.

9.3 displayGroup/row

This element contains a *row* of data to be displayed. If the data will not be displayed in tabular format, then this is simply a logical grouping of the data that displays.

9.3.1 Attributes

Name	Required?	Type	Description
layout	No	xs:string	This value specifies additional layout information for the data contained in this element. Most often, this will be either *header* or *trailer* to signify a table header or trailer.

9.3.2 Children

Name	Min	Max	Type	Description
text (displayGroupRowText)	0	∞	Element	This element can enclose a cell (if the data displays as a table), or a logical grouping of text (if not). The (∞) symbol represents infinity.

9.4 displayGroup/row/text

This element contains text that displays to the user. How this text displays is controlled by the layout ID of the row and the layout ID of the displayGroup. This text also may be an ID that is looked up in the I18N properties files to correct translations.

9.4.1 Attributes

Name	Required?	Type	Description
type	No	xs:string	This value either can be "id" (to specify that the element value is actually an ID that should be looked up in the translation files) or "text" (to specify that the element value should be displayed to the user - unmodified). If this value is not specified (or present), then "text" is assumed.
target	No	xs:string	If this element is included, then the text displays as a link. The target of the link will be the value set in this attribute.

9.4.2 Children

None.

10 Associated Documents Elements

10.1 associatedDocs

The associatedDocs element allows you to reference files outside of the UBF file. These files might include PDF documents, image documents, CSV documents, or other documents that you may want to view or download.

This element is used with the archive Archive format, and the documents referenced should be available in the archive.

10.1.1 Attributes

None.

10.1.2 Children

Name	Min	Max	Type	Description
document (document)	1	∞	Element	The actual reference to the associated file. The (∞) symbol represents infinity.

10.2 document

10.2.1 Attributes

Name	Required?	Type	Description
linkid	Yes	xs:string	A unique ID for this document. You only need to make this ID unique for this bill. For DSS class1, the following linkids are predefined: bill_pdf – The PDF that contains the bill. bill_image – An image of the bill.
content	Yes	xs:string	Mime type for the document, such as application/PDF or image/PNG.
group	No	xs:string	Optional value allows documents to be combined (or grouped together). For example, if there are PNG images to display the bill summary, the group for all images would be *bill summary* and the index attribute would specify the page number.
index	No	xs:string	This attribute is commonly used in conjunction with the group attribute to specify a page number or an ordering for the documents in a group.
filename	Yes	xs:string	The filename of the document. This file must be found in the archive with the UBF file.

10.2.2 Children

None.