CTI Billing Solutions Limited

Data Description

Analysis 7 1.10 – Core

Product	Analysis 7
Product version	1.10
Doc Ref	MMA7DD
Doc Version	1.0
Doc Status	Published
Circulation	Commercial in confidence
Doc Size	43 pages

CTI Billing Solutions Limited

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Document control

Version	Status	Date	Authors	Change note
1.0	Draft	21 July 2014	Stephen McKenzie / Sandra Biddle	Draft created from Analysis 7 v1.09 Data Description document v1.0 First draft for A7 v1.10 ▪ Updated - Data Hierarchy Diagram and description (2.2 and 2.3) ▪ New/Updated - Tax changes and reports (3.2, 3.3, 3.5 and 3.5.4)

Distribution list

Approval

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Document conventions

The following typographical conventions are used throughout this document.

Special notices

This symbol followed by green text enclosed in horizontal rules	Hints and tips on the process being described.
This symbol followed by red text enclosed in horizontal rules.	A warning about the process being described.
This symbol followed by blue text enclosed in horizontal rules.	Important note or supplementary information about the process being described.

Contextual indicators

Serif italics	Used to indicate a *cross-reference* to another CTI Group document or to another section of part of this document
Strong serif italics	Used to cite a reference to an ***external document,*** that is a non-CTI Group document
Sans-serif italic emphasis	Used to indicate a reference to an *entity name* within the application being described (that is, the name of a *panel*, a *screen*, or a *data* field). For example: The *Scheduled reports* tab, the *Main Menu*
`<Monospace in angled brackets>`	Used to indicate a `<token>`, for which you should substitute an actual value. For example `<profileName>` should be replaced by your profile name (`acme`) as allocated by CTI Group.
`Monospace text`	Used for the name of computer entities, such as a `filename` or a `/directory/path` name Also used to indicate `text` and `commands to be` entered. For example, 1. Input `My descriptive text` as **Description** 2. Input `sysadmin` as **Username**

`Monospace text on grey`	Used to show portions of code, scripts, or configuration files; and also multiple command line entries.
	For example:
	`cd /usr/`
	`mv myDirectory/ theirDirectory/`

Arial Narrow Italic - Grey	Used for table and figure caption text.
This symbol and bold text	This is used as a procedure header, which introduces a set of numbered instructions.
1. Numbered lists	Numbered lists are used exclusively for sequential instruction sets. They will usually be preceded by a procedure header.

Strong emphasis	Used to indicate one of the following on-screen elements, depending upon the context in which it appears: ▪ A **button** or **option** to be selected For example, click the button labelled Next to go to the next dialogue panel is simply: **Next** to continue ▪ Text to be typed For example: Type **This** ▪ A data field **Name** into which information is to be typed For example Input a **Description**
[Strong emphasis in square brackets]	Used to indicate a physical key (or button) to be pressed; for example the **[Enter]** key.

Document definition

Objectives

This document facilitates a common understanding of the data requirements and data discussions by relating *Analysis7* (*A7*) functionality to the data referenced in its companion document, the ***A7 Data Interface Specification*** (***DIS***).

Document terminology

Within this document:

- *Service-provider* refers to the organisation purchasing the A7 solution from *CTIG* and providing that solution as a service to their customers.
- *User* refers to any user of the A7 solution, whether or not they are assigned to an account or *subscriber-device* (for example, they may be a customer-service agent or administrator).

Presentation

The document is intended to be printed in double-sided format, with new sections beginning on facing pages; this can result in blank pages if the document is viewed as a PDF or is printed single-sided.

Use

The *CTI/Service-provider* project team uses this document during the implementation of A7 solution.

Audience

- CTI (General),
- *Service-provider* project management,
- *Service-provider* Incident management;
- *Service-provider* Application development/maintenance.

Related documents

Document title	Description	Reference
XML Data Interface Specification	CTI Standard Data Interface Specification, XML Format	
Data Limits and Constraints : A7	Max values and limits supported in the Analysis 7 product	
Product Specification : A7	Detail description of the Analysis 7 functionality	MM*A7*PSD

Contents

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1. Introduction

This document does not form part of a data contract between *CTI* and the *service–provider;* the project team create a specific ***Data interface specification (DIS)*** for that purpose.

This document is a companion to the core ***A7 XML Data Interface Specification (DIS)*** and helps to relate the data referenced in the ***DIS*** to functionality in *A7*.

Used together these two documents give an understanding of the terminology used in the ***DIS*** and translate it into *service-provider*-specific data. This will enable the *service-provider* to create data in the standard format and/or understand how bespoke data feeds fit in with *A7*.

This ***Data description document*** is a guide, whereas the ***DIS*** forms part of the contractual agreement and remains the definitive statement on the data interface.

In the event of any disparity between the two documents, the contents of the DIS are binding.

2. Data feed format

As defined in the ***DIS***, *A7*'s standard data format is XML,

For the purpose of this document it is helpful to know that XML comprises a set of elements, each of which has one or more attributes, for example:

```
<element attribute1="1234" attribute2="John Smith" />
```

Each XML element defines either an object (for example, a handset), or an event, (for example, a call), with each of its attributes describing an aspect of the object or event.

So, for example, a `<Call>` element may have attributes such as `duration` and `cost`:

```
<Call duration="25634" cost="1.3465"… />
```

This document describes how data is defined within the *A7* data feed identifying the features and functionality a particular piece of data drives or is used in.

Typically, a single data feed file will contain all the information for a *Customer*/*Account* per billing system and cycle; from this point forward, when talking about the data, this is assumed to be the case.

2.1 Data feed structure

A7's data feed presents *Invoice*, *Charge* and *Call detail* data in a hierarchical structure – as shown in *Figure 1.* The data elements shown – and used throughout this document – are explained in *Table 1*.

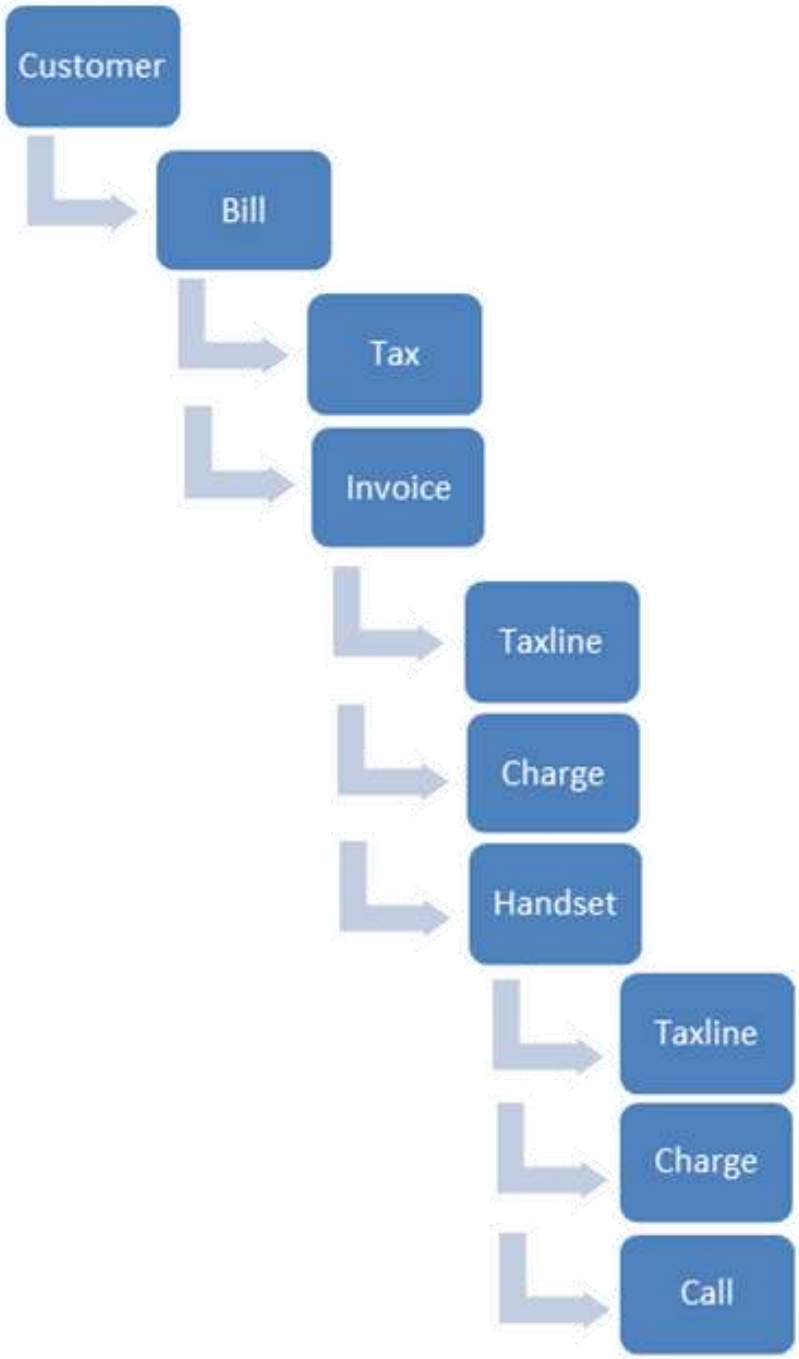


Figure 1: A7's data hierarchy

In addition to structuring billing items, A7 also provides ability to define where invoices, subscriber-devices, charges and calls belong – see: *Section 5.3 Data Structures (page25).*

2.2 Data feed elements

Table 1: A7 data feed elements

Element	Description
Customer	A *Customer* is the term used by *A7* to define the top reference point of an organisation. A place to assign a user with access to all information for that '*Customer*' using a single login.
Bill	A *Bill* is a container for multiple invoices covering the same billing period, billing cycle and currency; as such it will contain one or more invoices. A bill must contain ALL invoices applicable to a given combination of billing cycle, billing system and currency.
Invoice	The *invoice* details, as created, for payment. The attributes `Tax`, `InvoiceBalance` and `TotalPayment` must be populated at invoice level if they are required to be shown in *A7* **Related information:** *Section 3.1 Invoice attributes (page 7)*
Tax and Tax line	CTI's preferred method is to use the Tax and Tax line elements in the standard data model. **Related information:** *Section 3.2 Tax attributes (page 8)* *Topic 3.5.4 Tax based reports (page 16)*
Handset	A7 uses the term *Handset* to refer to any *subscriber-device* that can generate usage itemisation records. *Charge* records can also be associated to this.
Charge	This term refers to an itemised cost or charge for services, whether usage based, recurring or one-off. A charge may be associated directly to an invoice or to a subscriber-device, which is itself associated to an invoice. **Related information**: *Section 3.3* Charge attributes *(page 9);* *Section 5.3 Data Structures (page25)*
Call	This term refers to any subscriber-transaction that generates a usage itemisation record, regardless of the type of subscriber-device to which it relates. A usage itemisation record (for example a call detail record) will typically contain duration, event and/or usage information. **Related information**: *Section 3.4 Usage attributes (page 10);*

2.3 Data feed attributes

2.3.1 Customer attributes

Table 2: Customer attributes

Attribute	Description
CorpID	A unique reference for the customer, which: ▪ Remains the same when identifying the same customer; ▪ Identifies the customer within the relevant billing system.

Attribute	Description
Name	A textual identifier for the customer (for example, `CTI Group`).
ConsolidatedCorpID	Acts like a super-`CorpID` in that it provides a mechanism to group related `CorpID`. The `ConsoldiatedCorpID` exists outside of any single billing system and acts to link *CorpID*'s across multiple billing systems. **Related information**: *Section 5.1 Customer / Corporate Identification (page 23).*

2.3.2 Bill attributes

Table 3: Bill attributes

Name	Description
Date	The date of the bill.
Name	The textual identifier by which the bill is known.
DateFrom	The start date of the period covered by the *Bill.*
DateTo	The end date of the period covered by the *Bill.*

2.3.3 Handset

Table 4: Handset related information

Name	Description
Number	A unique identifier for the subscriber-device. For example a mobile phone would have a Caller Line Identifier (CLI); a number such as +44 7812345678.
Name	A textual description associated with the *Number*. For example, in the case of a mobile phone it could be the name of the subscriber.

3. Analysis fundamentals

A7 allows end users to analysis their data in a variety of ways. Essentially these are all reports of one kind or another; however, the terminology used in the UI differentiates between "reports" contained with "Reporting" section of the product and other functionality / features that display data, such the on the home page (Headline Summary, My Recent Charges, and "Totals" Graphs).

Information displayed throughout A7 is derived from a number of parts in the data, but predominately can come from:

- Invoice
- Tax / Tax Line
- Charge (at invoice or handset level)
- Call / Usage

Individual reports display either charge or call / usage based data, whereas other features can display data from a mixture of the sources.

Sections 3.1, 3.2, 3.3 and 3.4 describe attributes available in each of the four data elements. See the ***Data Interface Specification*** (***DIS***) for further detail

Sections 3.5 and 3.5.4 describe some of the ways this data is used throughout the application. See the ***Product Specification*** for further detail.

The following sections describe some of the ways in which data is displayed and used.

3.1 Invoice attributes

These are the data attributes available for the *Invoice* element (as described in the ***DIS***).

Table 5: Invoice attributes

Name	Description
Number	A billing-system-unique reference number for the invoice. ⓘ Must be unique
Date	The date the invoice was generated.
Due Date	The (latest) date payment of the invoice is due.
PreviousBalance	The previous invoice value for this invoice point.
TotalPayment	The total of any payments made for this invoice point since the previous invoice.
TotalAdjustments	The total of any adjustments made for this invoice point since the previous invoice.
InvoiceBalance	The balance due. This includes any amount outstanding from the previous invoice.
InvoiceAmountInclTax	The invoice amount including the tax amount.
InvoiceAmountExclTax	The invoice amount excluding the tax amount.

Name	Description
Tax	The tax amount for this invoice. Note this is just a tax total. Individual taxes are supplied via the *Tax* (*Topic 3.2.1*) and *Tax line* (*Topic 3.2.2*) elements.
Email	Recipient email address
Address1	Recipient address (part 1)
Address2	Recipient address (part 2)
Address3	Recipient address (part 3)
Address4	Recipient address (part 4)
Address5	Recipient address (part 5)
Address6	Recipient address (part 6)
Address7	Recipient address (part 7)
Address8	Recipient address (part 8)
GroupCode	Obsolete – company structure invoice record is now used to associate invoice to a location in the company structure – see ***DIS***
BillSystemReferencePoint	Used to store another billing system reference, other than invoice number

3.2 Tax attributes

These are the data attributes available for the *Tax and Tax line* elements (as described in the ***DIS***). Tax is supplied in two parts a *Tax* element which describes a tax rate, and one (or more) *Tax line* elements that describe instances of those taxes.

Tax is supplied at customer level, and Taxlines at the Invoice and/or Handset level, see the ***DIS*** for further details

Additionally a Charge element can have a TotalTax amount. This is separate from the Tax/Tax line data, and the two are not validated at data load. The value of TotalTax for all the charge elements, should, equal the value of all the Tax line elements (for example it there are £100 of Total Tax attributes, there should be £100 of Taxlines elements). It is the service-providers responsibility to ensure that this is correct.

3.2.1 Tax

Table 6: Tax attributes

Attribute name	Notes and limits
Code	Code for the tax rate, such as “STD” or “VAT”, etc.
Name	Description of the tax.
Rate	Rate of the tax expressed as a percentage (percentage sign should not be included).

3.2.2 Tax line

Table 7: Taxline attributes

Attribute name	Notes and limits
TaxableAmount	Total amount that *Tax line* is calculated on.
TaxCode	Tax code for this *Tax line.* ℹ Must be a valid tax code declared in a *Tax* element.
TaxAmount	Total tax for this *Tax line*.
BillingEntity	Billing entity *Tax line* is attached to. ℹ As tax is supplied at Invoice level, a Billing Entity must be created at that level to attach the Tax line too.
Service	The *Multiplay* service type associated with this charge. ✪ A7 does not translate the textual description of the service provided in the data feed; it is displayed as provided.

3.3 Charge attributes

These are the data attributes available for the *Charge* element (as described in the ***DIS***).

Table 8: Charge attributes list

Attribute name	Notes and limits
DateTime	The date and time associated to the charge.
DateFrom	The date associated with the charge. Set this to the start date for charges extended over a date-range.
DateTo	The date associated with the charge. Set this to the end date for charges extended over a date-range.
Type	✪ Superseded by ChargeSubCode. A valid value must still be supplied – see ***DIS***.
Value	The total actual charge amount for the charge detail
Description	The detail description for this charge
TaxCode	The tax code applied to this charge item.
svcPlatform	✪ Not used
svcType	✪ Not used
Service	The *Multiplay* service type associated with this charge. ✪ A7 does not translate the textual description of the service provided in the data feed; it is displayed as provided.
BillingEntity	Enables the assigning of a charge to an entity linked to a position in the organisational structure. ℹ **Related information:** *Section 5.3 Data Structures (page25)* *Topic 5.3.2 Using the Billing-entity element (page 29)*
Qty	The number of charges with the same `Description`, `UnitPrice`, and `TaxCode`. Set the `DateTo` and `DateFrom` to contain the first and last date of these charges

Attribute name	Notes and limits
UnitPrice	The charge amount per unit for this charge item.
OriginalValue	The total original value (that is, before discounts) for the charge item
TotalTax	Total tax amount for this charge. *Please note, this is not validated against the Tax line items provided for an Invoice or Handset, it is the service-provider's responsibility to ensure that they add up to the same total value.*
ChargeSubCode	The code used to categorise the charge record. ✓ The list of Charge category/Sub-category codes is defined as part of the project. This stage also links a sub code to a parent level category; therefore only the sub code is required in the data. This code categorises the charge but is not visible to users, who will instead see the textual description of the agreed parent- and sub-categories. **Related information**: *Topic 3.5.1 Charge Based reports (page 14).*
Data1	These three items are available to store bespoke information about this charge item.
Data2	These items do not appear in any core reports, but may be used in bespoke reports.
Data3	

3.4 Usage attributes

These are the data attributes available for the *Call* element (as described in the ***DIS***) and describe the usage itemisation.

Here – and throughout this document – the term *Call* refers to any usage transaction and can arise from any one of a variety of *services-provider* services, for example:

- A voice call with a date/time and duration;
- A data transaction with a date/time and data volume;
- An event (e.g. an SMS text) transaction with a date/time and event count.

Table 9: Call/Usage Itemisation Information

Attribute name	Description
DateTime	The date and time that the usage occurred
Number	A unique identifier for the subscriber-device making the usage-transaction. Depending upon the type of subscriber-device this can be: ▪ A dialled-number (for example `01234 567890`) for a voice call; ▪ A WAP address (for example `wap.website.co.uk)` for a mobile data exchange; ▪ A VPN tunnel termination point (for example, `http://123.456.78.90`) for a data transmission; Alternatively it can just be a text label such as `Data` or `TV Service`. A7 does not normalise dialled-numbers. It treats +447900123456 and 07900123456 as being different numbers, so they will not appear as a single entry in reports (for example, the most frequently dialled report).
AreaCode	▪ For dialled-numbers this identifies the area code. For example it may be a UK STD area codes, so if the dialled-number is `01254`

Attribute name	Description
	`291500`, the area code is `01254`; which is Blackburn. ▪ In all other cases you may use this code to define a consolidation level beneath *Sub-category* for group related items – see *Category* in this table. So, for example, in the case of data connections, it could contain a sub-domain name.
Location	▪ For dialled-numbers: A text description intended to help the end user understand the termination point of the usage. Its contents can be quite broad ranging, but include examples such as: ▪ Voice call to mobile network The name of the network the voice call terminated on (for example *ExampleTelco Mobile*); ▪ Voice call to a fixed line The geographical location of the termination point (for example, *Blackburn* for calls to 01254 numbers). ▪ In all other cases it could be a label describing, for example: ▪ The type of service. Such as `Broadband Services` for an ADSL data transaction; ▪ The cost-rate the transaction occurred under, such as `National Rate`.
User	Not used – deprecated.
Cost	The actual monetary cost of the usage. The primary monetary cost value used in the product, the sale price of the usage record.
OriginalCost	A secondary monetary cost of the usage, for example, cost pre-discounts/bundles (pre bundle Sale price).
Duration	The duration of the usage record in seconds. Specify this as zero for non-duration-based items. The assumed value is zero if you do not provide the attribute.
DataVolume	The data volume (in bytes) of a data transaction usage record, such as mobile data usage or a 3G 'dongle' SIM Card usage. Specify this as zero for non-data-usage items. The assumed value is zero if you do not provide the attribute.
Events	An event is non-duration and non-data based usage. Commonly used for mobile telephony events such as SMS texts; the content is a count of event occurrences for the usage record.
Category	Allows Usage records to be categorised, grouping similar usage together. In this two level categorisation, the sub-category level is provided and the parent category is derived. The list of parent-, sub-categories and their relationships is defined as part of the project; only the sub-category need be provided in the data feed. **Related information:** *Topic 3.5.2 Usage Based reports (page 14).* This code categorises the usage but is not visible to users, who will instead see the textual description of the agreed parent- and sub-categories.
TxType *	A code to represent the mechanism for how the transaction was actually conducted. For example: ▪ Mobile voice, ▪ Fixed Wire Voice, ▪ SMS,

* Denotes the flag in the data is translated/tokenised for displaying to the user

Attribute name	Description
	▪ Data. ℹ Increasingly IP is used to deliver services, so the on-going relevance of this field and how it can be meaningfully populated should be considered.
Bundle *	A flag to indicate the bundle classification of the usage record. Primarily used for Mobile telecommunication services. For examples: ▪ The usage is covered as part of a bundle package; ▪ The usage would be covered, but the bundle has been exceeded.
Roam *	A flag to indicate a roam status for the usage record. ✪ This is a specific distinction for mobile telecommunication services; for other services this flag might not be applicable.
VPN *	If a virtual private network infrastructure is provided, then usage could be categorised on the usage of the VPN. For example for differentiating between usage provided over the VPN and not.
Peak *	A time band within which the usage was made.
Allocation	✪ Not used
Internal *	A flag to denote the call is classed as internal. For example, A usage record pointing to another device within the organisation would be classed as internal.
TaxCode *	A code to relate to the tax rate the call is applicable for
Network	Description of the network used to deliver the usage record. Shown if required, at the usage itemisation level of reports only
CallDir *	Represents the direction of the usage, either an inbound leg or an outbound leg.
Service	The *Multiplay* service with which this call is associated. ✪ This value is not translated; it is shown as provided in the data.
svcPlatform	✪ Not used
svcType	✪ Not used
Usage	A flag to determine the type of the usage record. It is set to indicate whether the usage record is based on ▪ Duration, ▪ Event ▪ Data volume consumption.
SourceNetwork	The originating network used to deliver a usage record. Typically used for mobile traffic whilst roaming. Shown if required, at the usage itemisation level of reports only
TargetNetwork	The destination network used to deliver a usage record. Typically used for mobile traffic whilst roaming or an international call. Shown if required, at the usage itemisation level of reports only
SourceCountry	The country where a usage record originated. Typically used for mobile traffic whilst roaming.
TargetCountry	The country where a usage record terminated.

Attribute name	Description
	Typically used for mobile traffic whilst roaming or an international call.
TaggingStatus	A flag in the data to highlight whether a call should be classed as a business or personal call.

3.5 Reports

On the whole all *A7* reports contain either *Charge* and/or *Call/Usage* information. Additionally there is a report that contains tax information only (see section 3.5.4)

Related information:

Section 4.2 Predefined reports in the ***Analysis7 1.07 Product specification***.

Both *Charge* and *Usage* records can be associated with a variety of *Services* (*Multiplay*)[3].

A7 has the ability to report across the combined view of all the *Service* offerings, or to filter a specific *Service*.

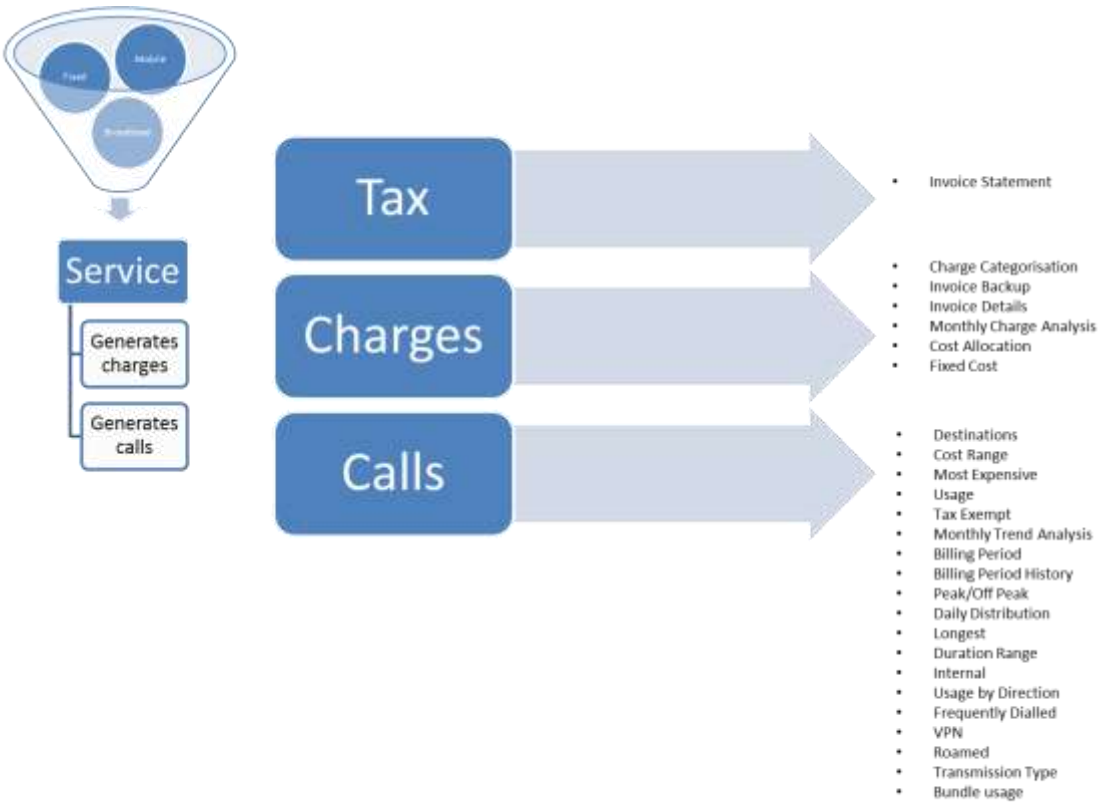


Figure 2: A7 Report fundamentals

[3] Multiplay is a term used describing the provision of different telecommunication services, such as Internet access, television, fixed line, and mobile phone service, by organisations that traditionally only offered one or two of these services. Populating the service field enables users to filter reports and see usage / charges for a single service type.

3.5.1 Charge Based reports

The reports derived from charge records are listed in *Table 10 (below)*, which also identifies the *Data element* and *Key data attribute* each requires from the ***DIS***.

Table 10: List of Charge based reports

Report Name	Data Element	Key Data Attribute	Description/Notes
Charge Categorisation	Charge	ChargeSubCode	The report shows all parent *Charge categories,* The drill-down shows only those *sub-categories* used by the *customer* in that *bill*. **Further information:** *Table 13 (on page 20)*
Invoice Backup	Charge	Description Qty UnitPrice TaxCode	A combination of these fields makes up the grouping for this report. *Charge*s need to be provided at this level of summary (that is, Qty should not be one if there are *Charge*s with the same values for the same handset/invoice).
Invoice details	Invoice	Number	First level takes the values straight from the invoice element – explicit values used
	Charge	ChargeSubCode	Second level drills into the *Charge*s associated with that *Invoice number*

3.5.2 Usage Based reports

The reports derived from Usage (Call) i*temisation* records are listed in *Table 11* (*below*), which also identifies the *Data element* and *Key data attribute* that each report requires from the ***DIS***.

Table 11: List of Call based reports

Report Name	Data Element	Key Data Attribute	Description/Notes
Destinations	Call	Category	All Parent categories will be shown on the report, *drilling-down* into those will show only the sub-categories used by the customer in that bill.
Cost Range	Call	Cost + Bundle	The cost is the primary item used for this report, but the bundle is also used to distinguish between calls that are free phone numbers and those that are free because they are included in a bundle. **Further information:** *Section 5.7.1 Cost Range Report* in the ***DIS***.
Most Expensive	Call	Cost	Shows the usage record of the most expensive records
Usage	Call	Usage	**Further information:** *Section 5.5.7 Usage* in the ***DIS***.
Tax exempt	Call	TaxCode	Shows usage that is exempt from tax (based upon its associated tax code).

Report Name	Data Element	Key Data Attribute	Description/Notes
Monthly Trend Analysis	Call	DateTime	Report based on the date of the usage record, irrespective of billing period (bill chosen)
Billing Period	Call	DateTime	Report based on the date of the usage record, without in selected billing period (chosen bill)
	Bill	Date/Month/Year?	The period will be shown as provided in the *Bill* element
Billing Period history	Call	DateTime	Report based on the date of the usage record, without in selected billing period (previous bills)
	Bill	Date/Month/Year?	The period will be shown as provided in the *Bill* element
Peak/Off peak	Call	Peak	**Further information:** *Section 5.5.8 Peak* in the ***DIS***.
Daily Distribution	Call	DateTime	Based on the time of the usage record
Longest	Call	Duration	Based on the duration of the usage record
Duration Range	Call	Duration + UsageType	The duration is the primary item that is used for this report but the usage type is also used, non-duration type reports go in a special category. **Further information:** *Section 5.7.2 Duration Range Report* in the ***DIS***.
Internal	Call	Internal	Based on the Internal flag of the usage record
Usage by direction	Call	CallDir	Based on the call direction flag of the usage record
Frequently dialled	Call	Number + Location	Based volume of usage records on the unique combination of number and location data
VPN	Call	VPN	Based on the VPN value of the usage record
Roamed	Call	Roam	Based on the Roam flag of the usage record
Transmission type	Call	TxType	Based on the TxType flag of the usage record
Bundle usage	Call	Bundle	Based on the Bundle flag of the usage record
Multiplay	Call	Service	*Service* can be applied to both charges and call details, this report is specifically related to the itemisation records and the *Services* used.

3.5.3 Combined Charge and Usage based reports

Currently only the *Line summary* report uses both Usage itemisation and Charge records.

Report Name	Data Element	Key Data Attribute	Description/Notes
Line Summary	Charge	ChargeSubCode	Shows the charge amount for each parent charge category
	Call	Events, Duration, DataVolume	Each of these values is totalled at the line /handset level, usage is also used to get the number of duration-based records.
	Handset	Number	There is a line per handset number for this report, showing the values of the calls and charge records

3.5.4 Tax based reports

Currently only the *Invoice Statement* report shows Tax breakdown information.

Report Name	Data Element	Key Data Attribute	Description/Notes
Invoice Statement	Tax	Code, Rate	Name is not essential but is recommended as the report may not make sense without it
	Tax line	TaxCode, TaxAmount	

3.6 Other features

3.6.1 Home Page (Dashboard)

The features on the home page *Table 12 (below),* which also identifies the *Data element* and *Key data attributes* each requires from the ***DIS***. Unlike the reports which are based only on either *Charges* or *Usage*, these features can draw information from a number of sources in the data.

Table 12: Home page features

Item Name	Data Element	Key Data Attribute	Description/Notes
Headline Summary	Charges	Value	Shows individual charge amounts based on charge model
	Tax line	TaxAmount	
	Call	Duration Events DataVolume Cost OriginalCost	

Item Name	Data Element	Key Data Attribute	Description/Notes
	Handset		
	BillingEntity		
My Recent Charges	Charges	Value Service	
	Tax line	TaxAmount	
	Call	Cost Duration Events DataVolume Service	
	Handset	Service	
"Totals" Graphs	Charges	Value	"Total Cost" chart
	Call	Cost	"Usage Cost" chart

4. Categories

There are category reports for both Charge and Call/Usage records.

Amongst the areas to consider before deciding upon your categories, are:

For more information

See *Section [5 Configuration Items] in the* ***DIS***.

- Familiarity

  With what terms are your users and customers familiar? Use terms they are accustomed to seeing on their invoices or other product offerings?

- Flexibility

  Ensure that the categories suit all *Multiplay* service offerings. Some may not, and that is to be expected, try to find the one that covers the most common scenarios;

- Conflicts

  Are there specific reports that would conflict with the chosen categories – or with the services that can be used? For example, having both a *Data* category and a *Data* transmission-type could cause obvious confusion;

- System constraints

  There is a limit on the number of parent categories you may have – and they will always be shown in the two category reports (charges and call/destinations).

4.1 Charge Categorisation

The *Charge-category»Sub-category* provides the means to group related individual charge items – see examples in *Table 13* (*below*).

As part of the project, the `ChargeSubCode` values are agreed, and the parent-, sub-category relationship established.

Whilst the individual charge items may be associated with specific *Multiplay* services, related charges can be grouped together using a common categorisation (the *Charge category»Sub-category* combination). The individual charge items will have the description of the charge.

Example:

- The one-off setup charges for TV, Mobile and Broadband can all share the categorisation *One-off»Set-up.*
- Applying the sub-code OO01 to all individual charge items with a description of *Promotional installation discount* (which could relate to any type of service) would see them all categorized as One-Off»Setup charges.

Note that Discounts appears in more than one parent category.
A7 allows the same textual description for a sub-category to appear in multiple parent categories providing the associated ChargeSubCode uniquely identifies each occurrence.

Table 13: Example charge categorisation.

As shown in *A7*		As provided in the data feed
Charge category	**Sub-category**	**ChargeSubCode – data example**
Recurring	Line Rental	RC01
	Discounts	RC02
	Bundle package	RC03
One-Off	Setup	OO01
	Discounts	OO02
	Purchase	OO03
Usage	Phone Usage	UC01
	TV Usage	UC02
	Discount	UC03

4.2 Usage Categorisation

Table 14: Example call/destination categorisation

As shown in the product		As provided in the data
Call/Destination Category	**Sub-category**	**Category – data example**
Local	Local Rate NTS	L01
	Local	L02
National	National	N01
	0870	N02
Premium Rate	Calls to Mobile	PR01
	Mobile TXT/SMS	PR02
	Premium Rate Services	PR03
Non-Geo	0844 & 0871 Numbers	N01

As shown in the product		As provided in the data
Call/Destination Category	**Sub-category**	**Category – data example**
International	International Mobile	I1
	International	I2
	International Other	I3
Broadband	10GB Limited	BB01
	10GB Unlimited	BB02
	Fibre 500	BB03
	Fibre unlimited	BB04

5. Data-specific How-to

As illustrated in *Section 2.1 Data feed structure (page4)* there is a link between the different data segments, and a dependency between data items lower down the hierarchy view and those above them.

Usage records exist only to record the use of a *subscriber-device* (for example a *Handset*). It is logical, therefore, that in order to provide *usage records* in the data, the *subscriber-device* itself must also be described.

Likewise you can provision *charges* only if they are associated with a *subscriber-device* or an *invoice* (in the case of invoice-level charges). In either case you must provide the invoice or subscriber-device before any charge data.

Example: Invoice level charges

- A rental charge would be associated directly to a specific subscriber-device.
- A charge for itemised billing on an account would be an invoice level charge rather than a charge on the individual subscriber-devices.

A *Bill* is a collection of one or more Invoices; so *invoices* can be present in the data feed only after their associated *Bill* has been described.

And the *Bill* itself belongs to a specific *Customer*, which is the highest entity in the data hierarchy.

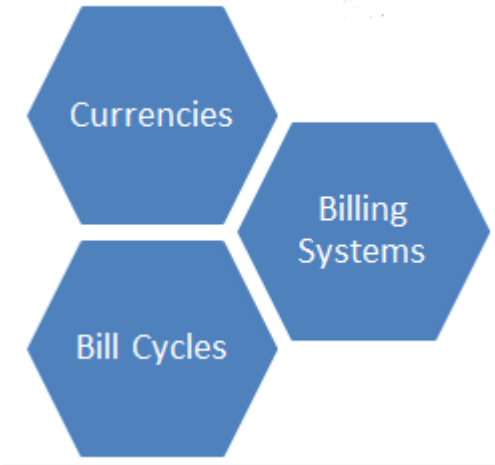
5.1 Customer / Corporate Identification

Multi-accounts

The *A7* solution supports *Multi-accounts,* allowing the viewing of an organisation as a whole, even if the data cannot be provided in a single file (perhaps because different billing systems or billing cycles are in operation).

Any solution dealing with *Multi-account* customers must address:

- *Data feeds in different currencies;*
- *Data feeds on different bill cycles;*
- *Data feeds from multiple billing systems.*



Example: *Multiplay* services may provide separate billing system feeds for each service (that is, mobile, TV or broadband).

A7 supports the addressing of these *Multi-account* concerns providing that certain data feed requirements are met; namely that the data feed provides a mechanism to link the individual files together in a combined view – for both the Organisation and the *Billing period*.

A7's core data feed allows for this in the following way:

- Organisational consolidation

  The `<Customer>` element contains both `CorpID` and `ConsolidatedCorpID` attributes, which allows the consolidation of *Customers* into one organisational view; across billing system feeds, bill cycles and currencies;

- Financial consolidation

  The `<Bill>` element contains `BillDate` and `Currency` attributes, which indicate the currency for the bill and the period in which bills from different data feeds can be combined.

Unable to provision the link … ?

If the data feed is unable to provide a linking entity (that is, *ConsolidatedCorpID*) then a manual method of identifying linked accounts is also possible.

This typically requires bespoke work to implement.

Don't need Multi-accounts … ?

If there is no Multi-account requirement, then there is no requirement to have a *ConsolidatedCorpID* in the customer definition.

The CorpID will be used to represent the customer in its entirety.

Example: See *Figure 3 (below).*
We can see how *A7* works to make up a consolidated customer view using data feeds from three (billing) systems, each with differing currencies and bill cycles; it combines the customer accounts to create a consolidated *CTI*group organisation.

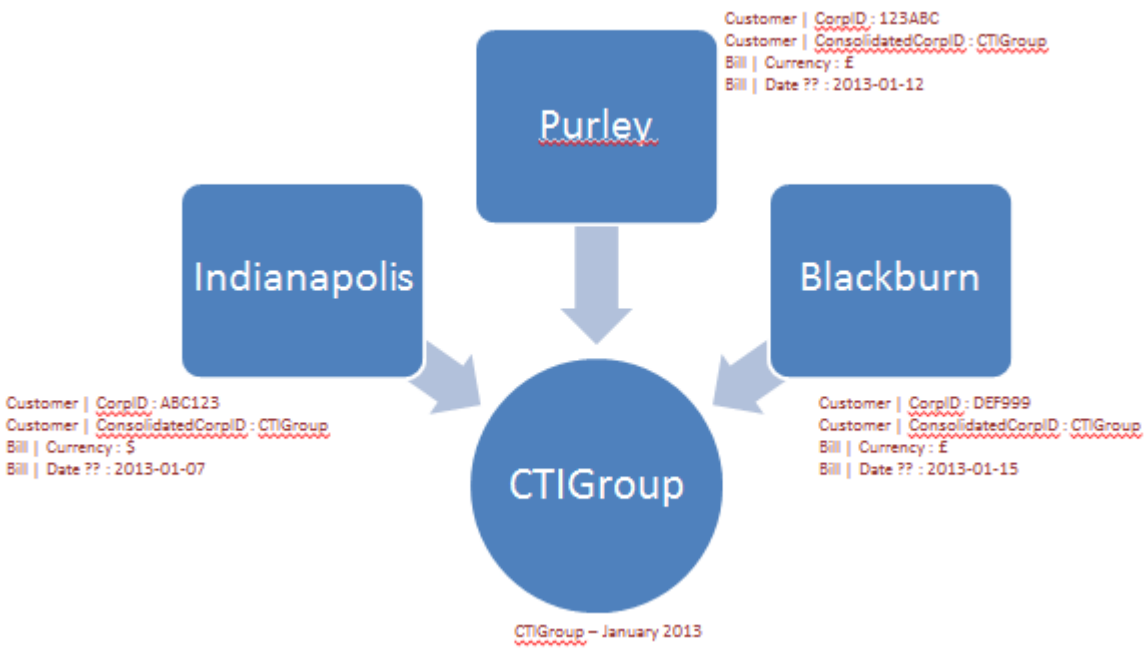


Figure 3: A graphical representation of multi-account processing

5.2 Invoices

A7 requires that the *Invoice number* be unique across all billing systems.

If there is even a small chance that multiple billing systems could generate the same *Invoice number* the data feed must add a billing-system-related prefix or suffix to each *Invoice number* presented via the data feed.

The chosen prefix/suffix is visible to the user, which ought to be a consideration when deciding on this tag.

Example
Invoice number normalisation

- Organisation XYZ Corp takes billing feeds from its mobile phone and broadband systems, both of which potentially generate like-numbered invoices `12345678`.
- To avoid a clash the data feed prefixes each *Invoice number* with a billing system code (MP and BB respectively).
- The resulting data feed *Invoice numbers* (`MP12345678` and `BB12345678`.) are unique within *A7*.

5.3 Data Structures

The data feed can provision *Organisation* or *Billing* structures other than the standard structure outlined in *Section 2.1 Data feed* structure *(page 4)*, allowing calls and charges to be reported-on across the structure.

By specifying where a subscriber-device resides on a structure you can view the call information at that level within the structure.

You can specify where subscriber-devices and invoices are linked; linking the invoice to a group is also important for functionality such as downloads, where there may be a link to get a PDF version of the invoice.

Example
A basic data structure

- Calls link to Handsets;
- Handsets link to Invoices;
- Invoices link to Bills;
- Bills link to Customers.

Knowing the position of the *Invoice* within the structure allows *A7* to map to the correct level, allowing users to see only permitted information.

5.3.1 Billing-defined structures

The sample *Billing-defined structure* – shown in *Figure 1 (on page 4)* – can be provided in the data feed.

Billing-defined structures are Read-only to the user, so we can link invoices to this structure at the appropriate level.

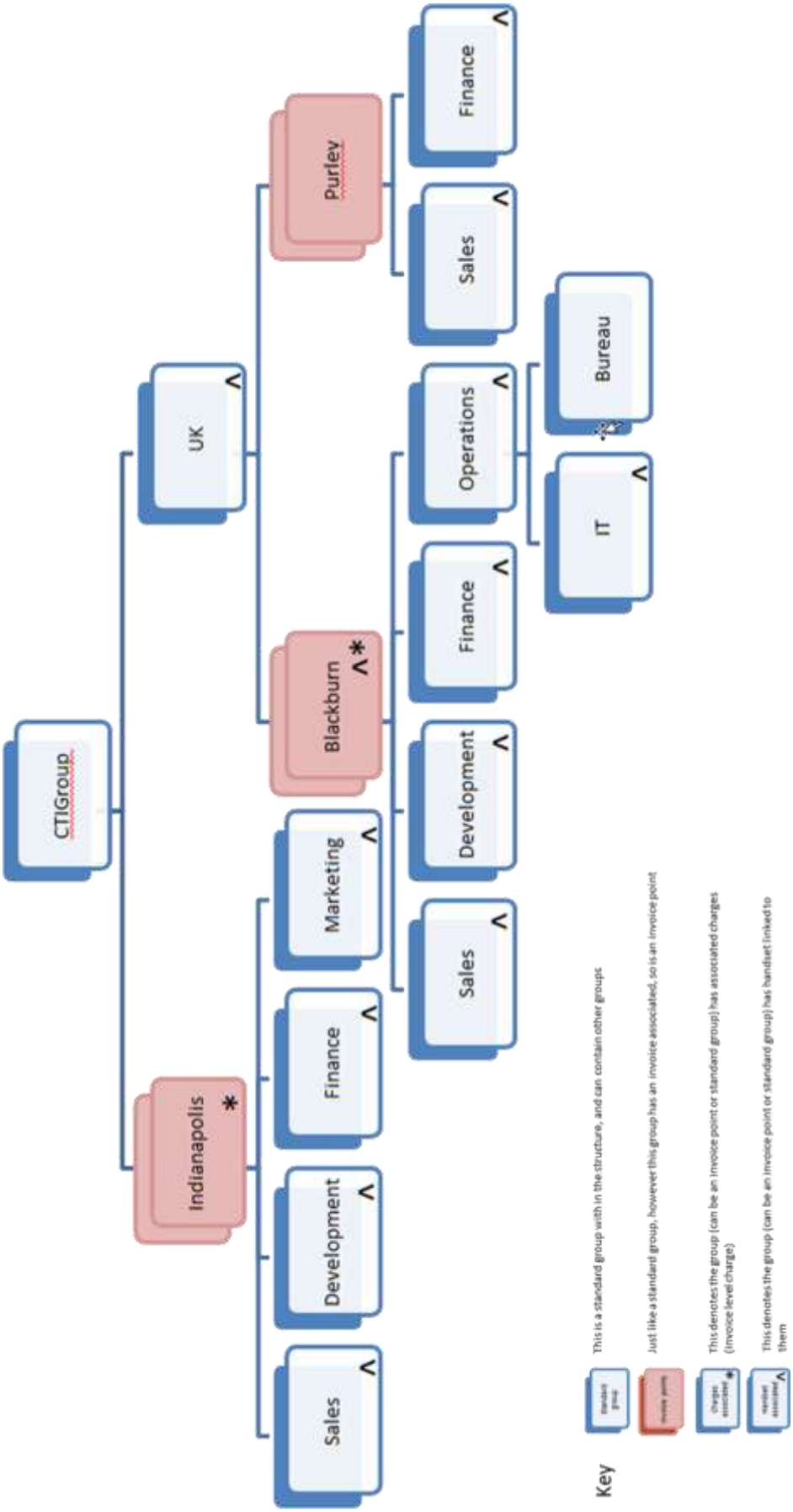


Figure 4: Example Billing-defined structure

5.3.2 Providing a multi-account data feed

This topic contains XML samples, which show how a data feed file would provide the example *Billing-defined structure – Figure 1 (on page 4)*

The example *Billing-defined structure* comprises two geographical areas, with different currencies, which means that *A7's Multi-account* support must be utilised in order to consolidate the group.

At the stage of assigning invoice and subscriber-devices we can just use the unique identifiers for each *Invoice number* and subscriber-device number because as per the DIS:

- The structure section of the file is contained outside the `<Bill>` element but inside the `<customer>` element;
- The `<Bill>` element will already have detailed all subscriber-devices, and invoices referenced in the structure.

Defining a single account group (Indianapolis)

The XML at *Figure 5 (below)* uses the elements `<Group>`, `<Handset>`, `<Invoice>` and `<BillingEntity>` to show:

- The organisational groups from *Figure 1 (on page 4)), Sales, Development, Finance and Marketing,* together with their associated subscriber-devices;
- The organisational group, *Indianapolis*, with an associated invoice.

> Note the Indianapolis group has a `Code` attribute populated with an account number.

```
<CompanyStructure>
     <Group Code="Acc01" Name="Indianapolis">
          <Group Name="Sales">
               <Handset Number="+1 12345678900" />
               <Handset Number="+1 12345678901" />
               <Handset Number="+1 12345678902" />
          </Group>
          <Group Name="Development">
               <Handset Number="+1 12345678910" />
               <Handset Number="+1 12345678911" />
               <Handset Number="+1 12345678912" />
          </Group>
          <Group Name="Finance">
               <Handset Number="+1 12345678920" />
               <Handset Number="+1 12345678921" />
          </Group>
          <Group Name="Marketing">
               <Handset Number="+1 12345678930" />
               <Handset Number="+1 12345678931" />
          </Group>
          <BillingEntity Number="Acc01" />
          <Invoice Number="U0000000001" />
     </Group>
</CompanyStructure>
```

Figure 5: Sample XML for the single account feed (Indianapolis)

Defining a multi-account group (UK)

The XML at *Figure 6 (below)* illustrates how to assign *Sub groups*, *Subscriber-devices* and *Invoices* as per the diagram in *(on page 4)*.

The ***DIS*** details the order in which elements appear within a `<Group>` element.

Note: The organisation name (the top level of the structure – *CTI*group in our example) is not provided in the `<CompanyStructure>` element of the data feed.

```
<CompanyStructure>
     <Group Name="UK">
          <Group Code="Acc02" Name="Blackburn">
               <Group Name="Sales">
                    <Handset Number="+44 12345678900" />
                    <Handset Number="+44 12345678901" />
                    <Handset Number="+44 12345678902" />
               </Group>
               <Group Name="Development">
                    <Handset Number="+44 12345678910" />
                    <Handset Number="+44 12345678911" />
                    <Handset Number="+44 12345678912" />
               </Group>
               <Group Name="Finance">
                    <Handset Number="+44 12345678920" />
                    <Handset Number="+44 12345678921" />
               </Group>
               <Group Name="Operations">
                    <Group Name="IT">
                         <Handset Number="+44 12345678930" />
                         <Handset Number="+44 12345678931" />
                    </Group>
                    <Group Name="Bureau" />
                    <Handset Number="+44 12345678940" />
                    <Handset Number="+44 12345678941" />
               </Group>
               <BillingEntity Number="Acc02" />
               <Handset Number="+44 12345678951" />
               <Invoice Number="B0000000001" />
          </Group>
          <Group Code="Acc03" Name="Purley">
               <Group Name="Sales">
                    <Handset Number="+44 12345678960" />
                    <Handset Number="+44 12345678961" />
                    <Handset Number="+44 12345678962" />
               </Group>
               <Group Name="Finance">
                    <Handset Number="+44 12345678970" />
                    <Handset Number="+44 12345678971" />
               </Group>
               <Invoice Number="B0000000002" />
          </Group>

     </Group>
</CompanyStructure>
```

Figure 6: Sample XML for the multi-account feed (The UK group)

Using the Billing-entity element

The billing-entity element acts as a hook for the assignment of invoice level charges to positions within a *Billing-defined structure*. Both XML samples contain `<BillingEntity>` in certain organisational groups.

The billing-entity element is identified by its number, which is typically the same as (or a derivative of) the `Code` attribute of its parent group. For example it may be an account number which, like a subscriber-device number, would not change month-on-month.

To assign an invoice-charge to a billing entity:

- Create a billing-entity element in the appropriate group;

```
<BillingEntity Number="Acc02" />
```

- Create a charge element within the appropriate <Bill><Invoice> element;

```
<Charge Type="Recurring" Qty="1" UnitPrice="15.00" Value="15.00"
OriginalValue="11.11" Description="Itemised Billing" TaxCode="STD"
DateFrom="2009-01-20" DateTo="2009-01-20" Service="Mobile">
```

- Quote the billing-entity element's number as the charge element's `BillingEntity` attribute,

```
<Charge BillingEntity="Acc02" Type="Recurring" Qty="1"
UnitPrice="15.00" Value="15.00" OriginalValue="11.11"
Description="Itemised Billing" TaxCode="STD" DateFrom="2009-01-20"
DateTo="2009-01-20" Service="Mobile">
```

> The charge element's billing-entity attribute is omitted when the charge is associated with (that is, beneath) a subscriber-device.

6. Summary

This document has covered the main aspects of *CTI*'s standard *A7* data feed format including data values and the hierarchical data structure.

The key aspects are around being able to provide the data described in *Section 3.5 Reports (page 13)* and *Topic 3.5.4 Tax based* reports *(page 16)*; these will dictate which reports and features are supported.

The remaining information in the *Charge* and *Call* records will dictate which columns are available at the detail drill-down-level of every report (charge or calls).

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