

# Usage Management

## Business Service Specification

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## USAGE MANAGEMENT

The usage API provides standardized mechanism for usage management such as creation, update, retrieval, import and export of a collection of usages.

Usage API manages both rated and non-rated usages.

For example, Usage API allows a service provider:

- To retrieve usage generated by a partner service platform in order to rate it
- To provide rated usages to a partner for consumption follow up purpose

Usage API manages usage resource:

- A usage represents an event that is of billing system's interest and can have charges applied to it. It is comprised of characteristics, which define all attributes known for a particular type of usage
- Main usage attributes are its identifier, date, type, type related specification, characteristics (name and value), status, related parties and rating related information (date, amount, taxes, etc.)

Usage API performs the following operations on usage:

- Retrieval of a usage or a collection of usages depending on filter criteria
- Partial update of a usage or of a collection of usages
- Creation of a usage
- Export of a collection of usages
- Import of a collection of usages

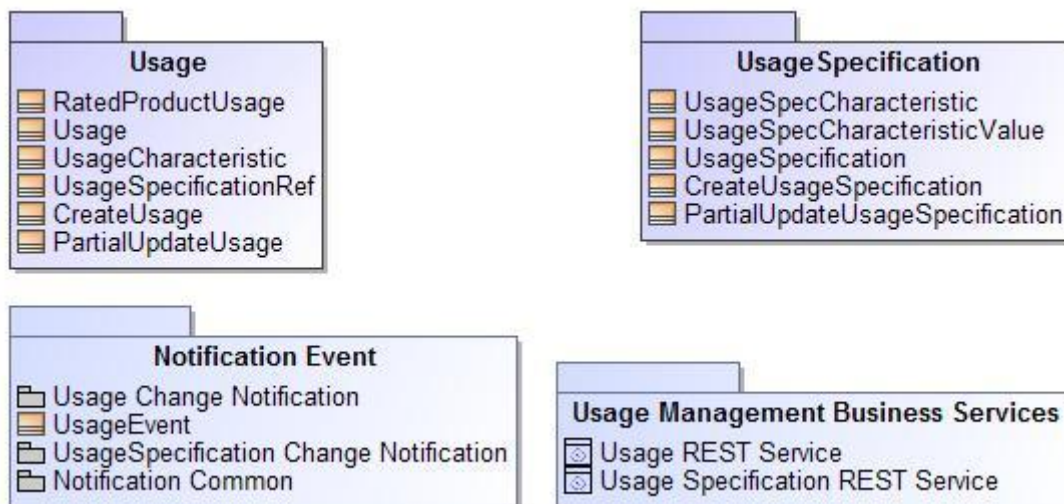


Figure 1. Usage Management

## USAGE MANAGEMENT BUSINESS ENTITIES

## USAGESPECIFICATION

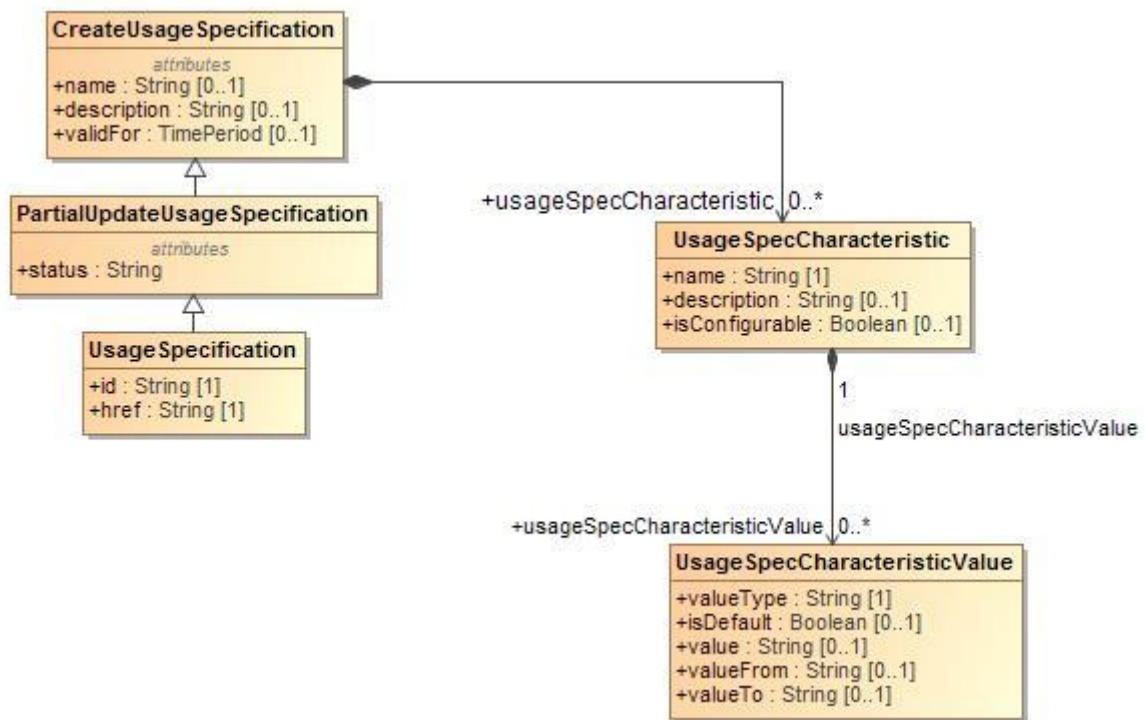


Figure 2. Usage Specification

## BUSINESS ENTITY – CREATEUSAGESPECIFICATION

### Attributes

Name	Type	Multiplicity	Description
description	String	0..1	A narrative that explains in detail what the usage specification is.
name	String	0..1	The name of the usage specification.
usageSpecCharacteristic	UsageSpecCharacteristic	0..*	
validFor	TimePeriod	0..1	The period for which the usage specification is valid.

### Business Rules

Name	Severity	Specification	Message
mandatory attributes		[usageSpecCharacteristic.name usageSpecCharacteristic.usageSpecCharacteristicValue.valueType]	

## BUSINESS ENTITY – PARTIALUPDATEUSAGESPECIFICATION

### Attributes

Name	Type	Multiplicity	Description
description	String	0..1	A narrative that explains in detail what the



			usage specification is.
name	String	0..1	The name of the usage specification.
status	String		Status of usageSpecification - in study, in design, in test, rejected, active, launched, retired, obsolete.
usageSpecCharacteristic	UsageSpecCharacteristic	0..*	
validFor	TimePeriod	0..1	The period for which the usage specification is valid.

## Business Rules

Name	Severity	Specification	Message
can be updated		[status - in study, in design, in test, rejected, active, launched, retired, obsolete description validFor usageSpecCharacteristic usageSpecCharacteristicValue]	
cannot be updated		[id href]	

## BUSINESS ENTITY – USAGESPECCHARACTERISTIC

### Attributes

Name	Type	Multiplicity	Description
description	String	0..1	A narrative that explains in detail what the usage specification characteristic is.
isConfigurable	Boolean	0..1	Boolean indicating if usageSpecCharacteristic is configurable or not.
name	String	1	The name of the usage specification characteristic.
usageSpecCharacteristicValue	UsageSpecCharacteristicValue	0..*	

### Business Rules

Name	Severity	Specification	Message
usageSpecCharacteristic		[name and value are mandatory]	

## BUSINESS ENTITY – USAGESPECCHARACTERISTICVALUE

### Attributes

Name	Type	Multiplicity	Description
isDefault	Boolean	0..1	Indicates if the value is the default value for a characteristic.
value	String	0..1	A narrative that explains in detail what the usage specification characteristic is.
valueFrom	String	0..1	The low range value that a characteristic can take on.
valueTo	String	0..1	The upper range value that a characteristic can take on.
valueType	String	1	A kind of value that the characteristic can take

			on, such as numeric, text, and so forth.
--	--	--	--

## BUSINESS ENTITY – USAGE SPECIFICATION

### Attributes

Name	Type	Multiplicity	Description
description	String	0..1	A narrative that explains in detail what the usage specification is.
href	String	1	Reference to usageSpecification.
id	String	1	Usage specification unique identifier.
name	String	0..1	The name of the usage specification.
status	String		Status of usageSpecification - in study, in design, in test, rejected, active, launched, retired, obsolete.
usageSpecCharacteristic	UsageSpecCharacteristic	0..*	
validFor	TimePeriod	0..1	The period for which the usage specification is valid.

## USAGE

A usage represents an event that is of billing system's interest and can have charges applied to it. It is comprised of characteristics, which define all attributes known for a particular type of usage.

Main usage attributes are its identifier, date, type, type related specification, characteristics (name and value), status, related parties and rating related information (date, amount, taxes, etc.).

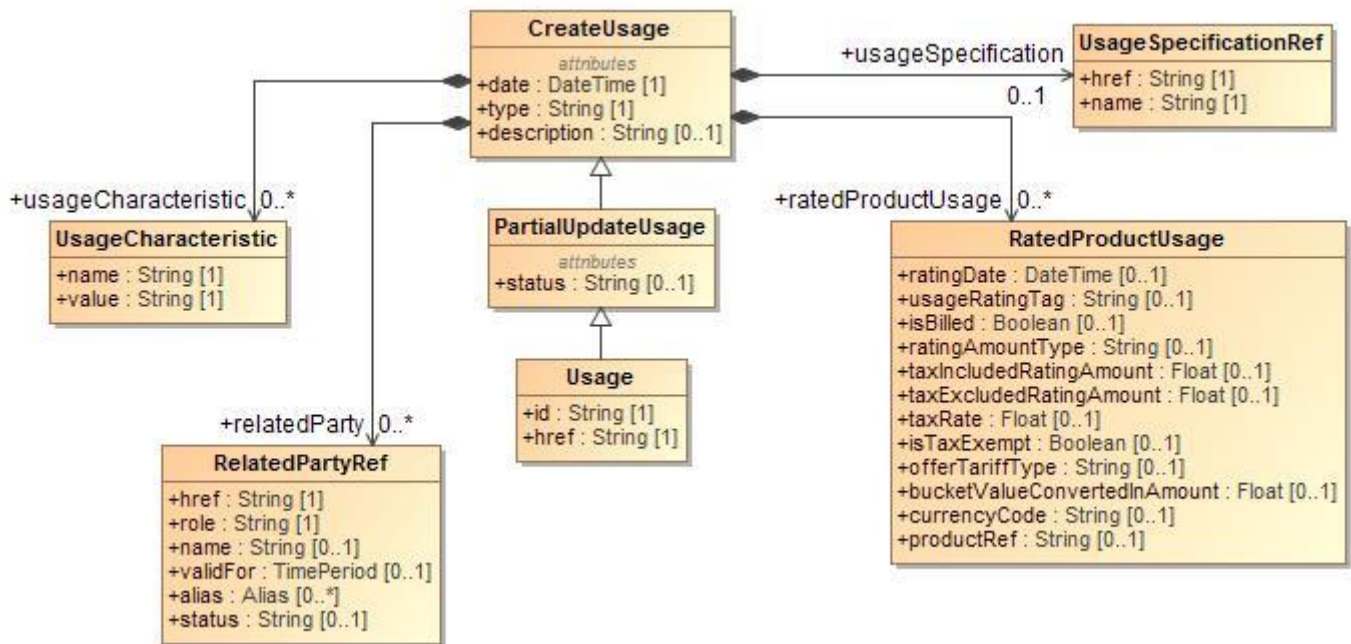


Figure 3. Usage

## BUSINESS ENTITY – CREATEUSAGE

An occurrence of employing a Product, Service, or Resource for its intended purpose, which is of interest to the business and can have charges applied to it. It is comprised of characteristics, which represent attributes of usage.

### Attributes

Name	Type	Multiplicity	Description
date	DateTime	1	Date of usage.
description	String	0..1	
ratedProductUsage	RatedProductUsage	0..*	
relatedParty	RelatedPartyRef	0..*	Defines party or partyRole linked to a specific entity.
type	String	1	Type of usage.
usageCharacteristic	UsageCharacteristic	0..*	Provides the value of a given characteristic.
usageSpecification	UsageSpecificationRef	0..1	

### Business Rules

Name	Severity	Specification	Message
mandatory attributes		[date type usageCharacteristic.name	

		<pre> usageCharacteristic.value relatedParty.role if usage.status = "rated" or "billed" then   ratedProductUsage.ratingDate  ratedProductUsage.taxIncludedR atingAmount  ratedProductUsage.taxExcludedR atingAmount ratedProductUsage.taxRate  ratedProductUsage.currencyCode ratedProductUsage.productRef if usage.status = "rated" or "billed" then  ratedProductUsage.usageRating Tag = "usage" ratedProductUsage.isBilled = false  ratedProductUsage.ratingAmount Type = "total"  ratedProductUsage.isTaxExempt = false  ratedProductUsage.offerTariffTyp e = "normal"] </pre>	
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## BUSINESS ENTITY – PARTIALUPDATEUSAGE

### Attributes

Name	Type	Multiplicity	Description
date	DateTime	1	Date of usage.
description	String	0..1	
ratedProductUsage	RatedProductUsage	0..*	
relatedParty	RelatedPartyRef	0..*	Defines party or partyRole linked to a specific entity.
status	String	0..1	Status of usage - received, rejected, recycled, guided, rated, rerated, billed.
type	String	1	Type of usage.
usageCharacteristic	UsageCharacteristic	0..*	Provides the value of a given characteristic.
usageSpecification	UsageSpecificationRef	0..1	

### Business Rules

Name	Severity	Specification	Message
can be updated		<pre> [date type description usageSpecification usageCharacteristic status - received, rejected, recycled, guided, rated, rerated, </pre>	

		billed relatedParty ratedProductUsage]	
cannot be updated		[id href]	

## BUSINESS ENTITY – RATEDPRODUCTUSAGE

An occurrence of employing a product for its intended purpose with all rating details.

### Attributes

Name	Type	Multiplicity	Description
bucketValueConvertedInAmount	Float	0..1	Monetary value of bucket.
currencyCode	String	0..1	A string used as a code for specifying the currency associated to the given amounts. The ISO4217 norm uses 3 letters to define the currency (for example USD for US dollar or EUR for Euro).
isBilled	Boolean	0..1	Boolean indicating if usage have been billed or not.
isTaxExempt	Boolean	0..1	Indicates if the rated amount is exempt of tax.
offerTariffType	String	0..1	Type of tariff applied.
productRef	String	0..1	Reference of product specification.
ratingAmountType	String	0..1	Type of amount.
ratingDate	DateTime	0..1	Date of usage rating.
taxExcludedRatingAmount	Float	0..1	All taxes excluded rated amount.
taxIncludedRatingAmount	Float	0..1	All taxes included rated amount.
taxRate	Float	0..1	Tax rate.
usageRatingTag	String	0..1	Tag value - usage : the usage is always rated outside a usage bundle; included usage : the usage is rated inside a usage bundle; non included usage : the usage bundle is exhausted. The usage is rated outside the usage bundle.

## BUSINESS ENTITY – USAGE

An occurrence of employing a Product, Service, or Resource for its intended purpose, which is of interest to the business and can have charges applied to it. It is comprised of characteristics, which represent attributes of usage.

### Attributes

Name	Type	Multiplicity	Description
date	DateTime	1	Date of usage.
description	String	0..1	
href	String	1	Reference to usage.
id	String	1	Usage unique identifier.
ratedProductUsage	RatedProductUsage	0..*	
relatedParty	RelatedPartyRef	0..*	Defines party or partyRole linked to a specific entity.
status	String	0..1	Status of usage - received, rejected, recycled, guided, rated, rerated, billed.
type	String	1	Type of usage.
usageCharacteristic	UsageCharacteristic	0..*	Provides the value of a given characteristic.

usageSpecification	UsageSpecificationRef	0..1	
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## BUSINESS ENTITY – USAGECHARACTERISTIC

### Attributes

Name	Type	Multiplicity	Description
name	String	1	The name of the usage characteristic.
value	String	1	A discrete value that the characteristic can take on.

## BUSINESS ENTITY – USAGESPECIFICATIONREF

A detailed description of a usage event that are of interest to the business and can have charges applied to it. It is comprised of characteristics, which define all attributes known for a particular type of usage.

### Attributes

Name	Type	Multiplicity	Description
href	String	1	Reference to usageSpecification.
name	String	1	The name of the usage specification.

## COMMON BUSINESS ENTITIES

### BUSINESS ENTITY – ALIAS

#### Attributes

Name	Type	Multiplicity	Description
type	String		
value	String		

### BUSINESS ENTITY – ARRAYUPDATE

Used to partially update an array

#### Attributes

Name	Type	Multiplicity	Description
op	String		Operation to be performed on the array - test, remove, add, replace, move, copy
path	String		The reference to the array to be modified
value	String		

### BUSINESS ENTITY – BILLINGACCOUNTREF

BillingAccount to use to bill the ordered products.

#### Attributes

Name	Type	Multiplicity	Description
href	String	1	Reference of the billing account.

### BUSINESS ENTITY – CHARACTERISTIC

Describes the characteristics of the individual or the organization such as individual hobbies, center of interests.

#### Attributes

Name	Type	Multiplicity	Description
name	String	1	Name of the characteristic.
value	String	0..1	Value of the characteristic.

### BUSINESS ENTITY – CONTACTMEDIUM

Describes the contact mediums that could be used to contact the customer (Email, TelephoneNumber, PostalAddress).

#### Attributes

Name	Type	Multiplicity	Description
isPreferred	Boolean	0..1	If true, indicates that is the preferred contact medium.
medium	Medium	0..1	Describes the contact medium that can be

			used to contact the customer.
type	String	1	Email address, telephone number, postal address, etc.
validFor	TimePeriod	0..1	The time period that the contact medium is valid for.

## BUSINESS ENTITY – CREATELISTENER

### Attributes

Name	Type	Multiplicity	Description
callback	String		Callback address of the listener
query	String		

## BUSINESS ENTITY – CREDENTIAL

### Attributes

Name	Type	Multiplicity	Description
login	String		
password	String		
updateType	String		

## BUSINESS ENTITY – HEADER

### Attributes

Name	Type	Multiplicity	Description
key	String		URL Parameter Key e.g., Content-Type
value	String		Value e.g., application/json, application/xml

## BUSINESS ENTITY – LISTENER

### Attributes

Name	Type	Multiplicity	Description
callback	String		Callback address of the listener
href	String	1	Reference to the listener
id	String	1	
query	String		

## BUSINESS ENTITY – MEDIUM

Describes the contact medium that can be used to contact the customer.

### Attributes

Name	Type	Multiplicity	Description
city	String	0..1	
country	String	0..1	
emailAddress	String	0..1	Full e-mail address in standard format (e.g., fred.bloggs@thing.com)



number	String	0..1	Phone number
postcode	String	0..1	Postcode
stateOrProvince	String	0..1	State or province
street1	String	0..1	Describes the street
street2	String	0..1	Complementary street description
type	String	0..1	Type of medium (fax, mobile phone...)

## BUSINESS ENTITY – MONEY

A base / value business entity used to represent money

### Attributes

Name	Type	Multiplicity	Description
amount	Float	1	A positive floating point number.
currencyCode	String	1	Currency. Notes: refer to [ISO 4217]
digits	Integer	0..1	Number of digits to the right of the decimal point

## BUSINESS ENTITY – NOTE

Extra-information about an entity (e.g. useful to add extra delivery information that could be useful for a human process : a digicode access to a building, ...).

### Attributes

Name	Type	Multiplicity	Description
author	String	0..1	Author of the note
date	DateTime	0..1	Date of the note
text	String	1	Text of the note

## BUSINESS ENTITY – PAYMENTMEANREF

### Attributes

Name	Type	Multiplicity	Description
href	String	1	Reference of the payment means
name	String	0..1	Name of the payment means

## BUSINESS ENTITY – PERIOD

defines the period of a recurring charge

### Attributes

Name	Type	Multiplicity	Description
endPeriod	DateTime	0..1	End date of the period
startPeriod	DateTime	1	Start date of the period

### Business Rules

Name	Severity	Specification	Message
StartPeriod Before EndPeriod	error	[startPeriod.before(endPeriod) or startPeriod = endPeriod]	The start period must be on or before the end period.

## BUSINESS ENTITY – PLACEREF

Used to defined a place useful for the entity (for example a delivery geographical place).

### Attributes

Name	Type	Multiplicity	Description
href	String	1	Reference of a place (for instance in Google map).
role	String	1	Role of the place (for instance delivery geographical place).

## BUSINESS ENTITY – RELATEDPARTYREF

Defines party or partyRole linked to a specific entity. Used to represent an association between a resource and a party or role object playing a role regarding that object.

### Attributes

Name	Type	Multiplicity	Description
alias	Alias	0..*	
href	String	1	Reference to the related party.
name	String	0..1	Name of the related party.
role	String	1	Role of the related party.
status	String	0..1	The status of the relationship between the party and the related entity.
validFor	TimePeriod	0..1	The period for which the related party is valid.

## BUSINESS ENTITY – TIMEPERIOD

### Attributes

Name	Type	Multiplicity	Description
endTime	DateTime	0..1	
startTime	DateTime	1	

### Business Rules

Name	Severity	Specification	Message
Start DateTime Before End DateTime	error	[startTime.before(endDateTi me) or startTime = endTime]	The start period must be on or before the end period.

**NOTIFICATION EVENT**

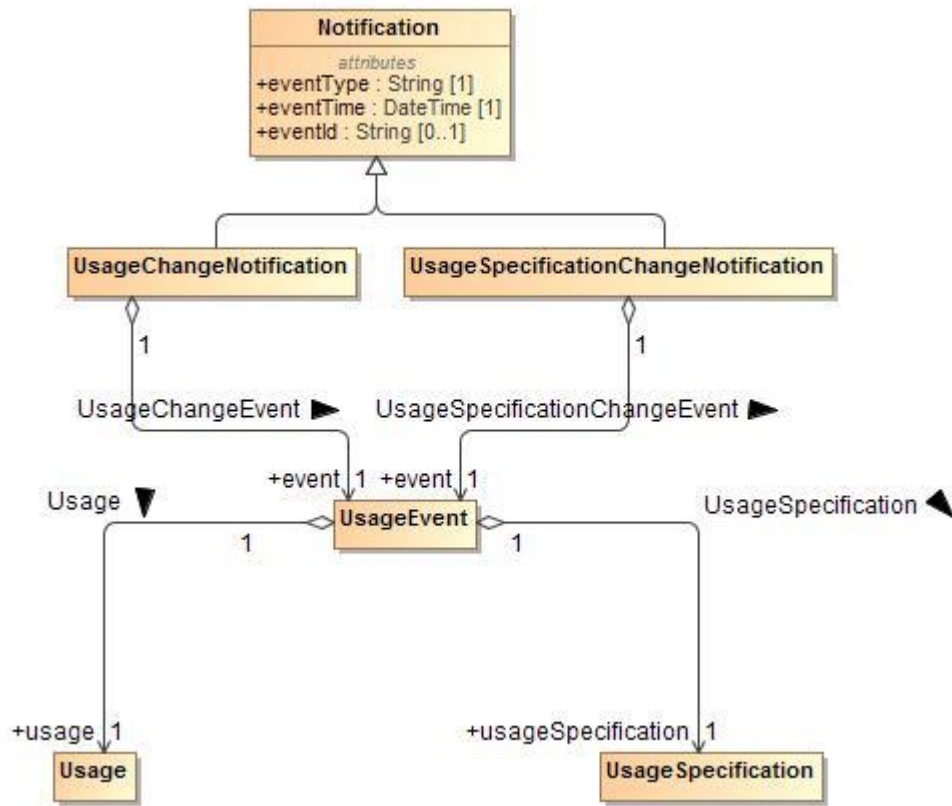


Figure 4. Usage Notification

**BUSINESS ENTITY – USAGEEVENT**

Attributes

Name	Type	Multiplicity	Description
usage	Usage	1	
usageSpecification	UsageSpecification	1	

**USAGESPECIFICATION CHANGE NOTIFICATION****BUSINESS ENTITY – USAGESPECIFICATIONCHANGENOTIFICATION**

## Attributes

<b>Name</b>	<b>Type</b>	<b>Multiplicity</b>	<b>Description</b>
event	UsageEvent	1	
eventId	String	0..1	Unique identifier of the event
eventTime	DateTime	1	
eventType	String	1	

**USAGE CHANGE NOTIFICATION****BUSINESS ENTITY – USAGECHANGENOTIFICATION**

## Attributes

<b>Name</b>	<b>Type</b>	<b>Multiplicity</b>	<b>Description</b>
event	UsageEvent	1	
eventId	String	0..1	Unique identifier of the event
eventTime	DateTime	1	
eventType	String	1	

**NOTIFICATION COMMON****BUSINESS ENTITY – NOTIFICATION**

## Attributes

<b>Name</b>	<b>Type</b>	<b>Multiplicity</b>	<b>Description</b>
eventId	String	0..1	Unique identifier of the event
eventTime	DateTime	1	
eventType	String	1	

## STATE MACHINE

**USAGESPECIFICATION**

**UsageSpecificationSM**

An Individual represents a physical person.

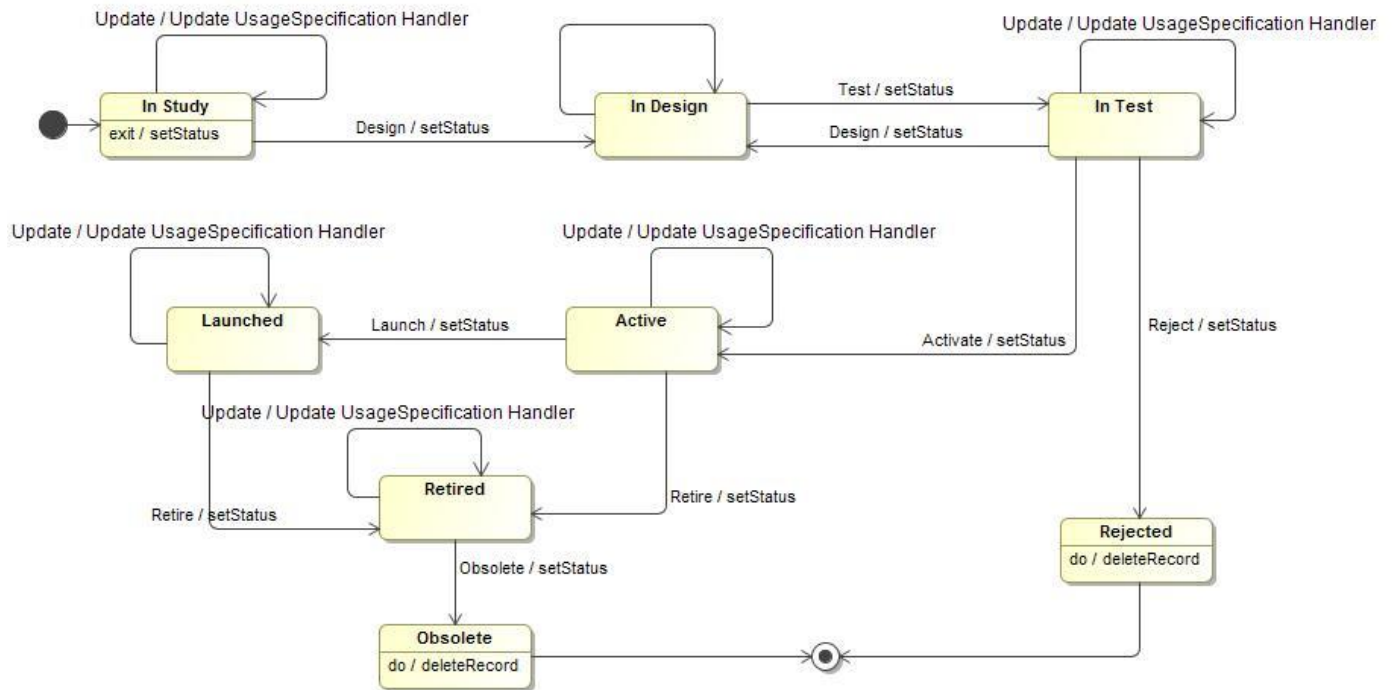


Figure 5. UsageSpecificationSM

Name	Description
<b>Active</b>	Then either the test is OK and then its status is changed to Active. When a UsageSpecification element is in a Active status it means it has been validated and tested, but it is still not available for customers.
<b>In Design</b>	When the conception of the UsageSpecification element is accepted its status is changed to In Design.
<b>In Study</b>	When the macro conception of a UsageSpecification element is started the first status of the later is In Study.
<b>In Test</b>	If the design is approved its status is changed to In Test.
<b>Launched</b>	When the beginning of marketing is reached, its status is changed to Launched. At this moment customers can buy it.
<b>Obsolete</b>	When no more customer holds the UsageSpecification element, its status is changed to Obsolete meaning it can be removed from the UsageSpecification.
<b>Rejected</b>	Test is not OK and its status is changed to Rejected. The Rejected status is a final status.
<b>Retired</b>	If the UsageSpecification element is not launched, its status is changed to Retired. The same status is achieved when a UsageSpecification element reaches the end of marketing.  The Retired status means it can not be sold to any new customers, but previous customers can still have it.



**USAGE**

**UsageSM**

An Individual represents a physical person.

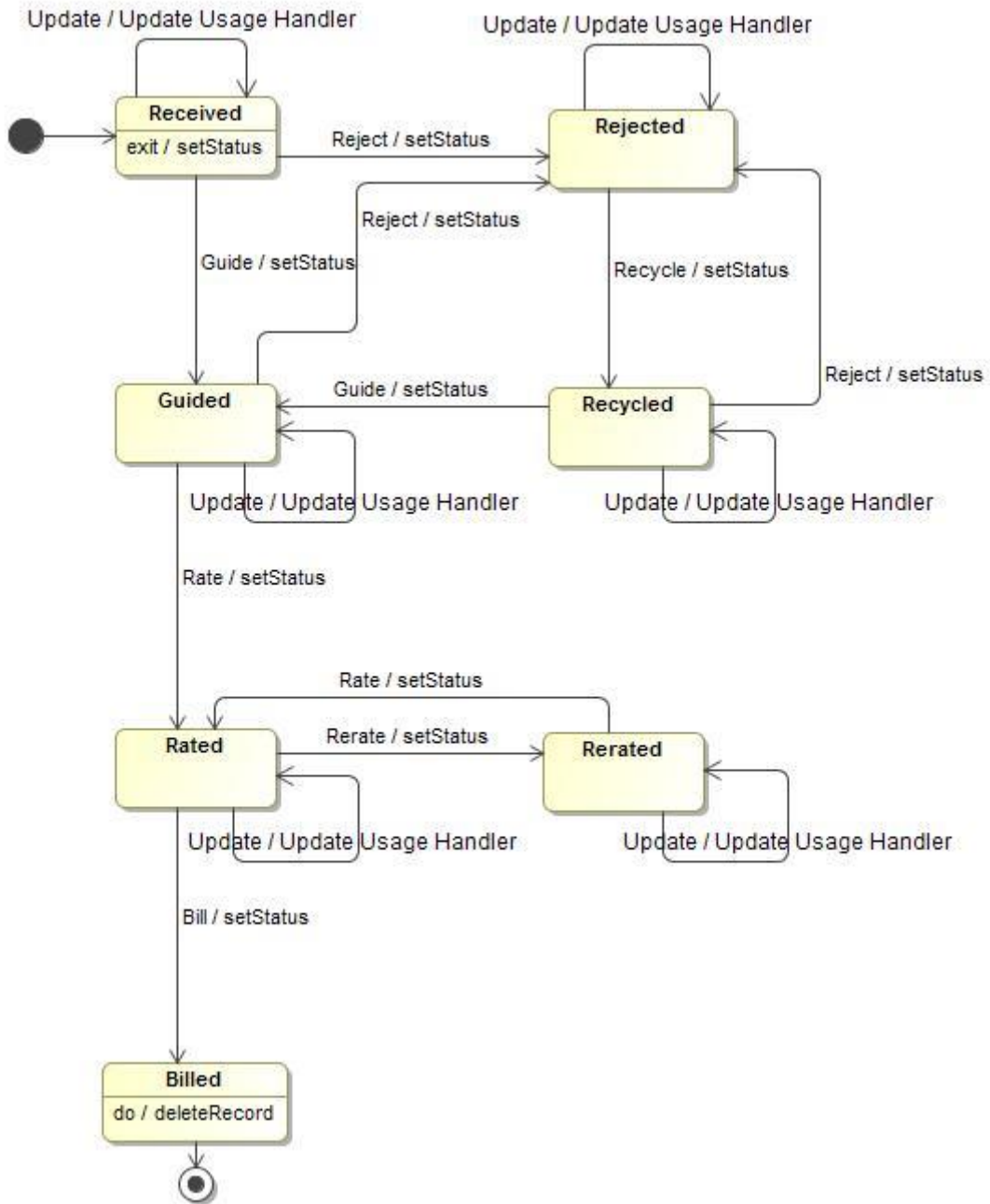


Figure 6. UsageSM

Name	Description
<b>Billed</b>	Billed for customer invoice.
<b>Guided</b>	Identified with customer and product references.
<b>Rated</b>	Rated, From this status on, the ratedProductUsage collection will have a values.
<b>Received</b>	Newly injected into the target system.
<b>Recycled</b>	Resubmitted after error correction.

<b>Rejected</b>	Rejected for validation error or similar reasons.
<b>Rerated</b>	Marked for re-rating

**USAGE MANAGEMENT BUSINESS SERVICES**

**BUSINESS SERVICE – USAGE SPECIFICATION REST SERVICE**



Figure 7. Usage Specification Business Service

**OPERATION – POSTUSAGESPECIFICATION**

**Description**

This operation is used to create a usageSpecification.

**Business Rules**

Name	Severity	Specification	Message
mandatory attributes		[usageSpecCharacteristic.name usageSpecCharacteristic.usageSpecCharacteristicV alue.valueType]	

**OPERATION – GETUSAGESPECIFICATION**

**Description**

This operation retrieves a usageSpecification.

**Business Rules**

Name	Severity	Specification	Message
mandatory attributes		[id]	

**OPERATION – GETUSAGESPECIFICATIONS**

**Description**

This operation is used to retrieve a collection of usageSpecifications.

**OPERATION – PUTUSAGESPECIFICATION**

**Description**

This operation is used to completely update the representation of a usageSpecification.

**Business Rules**

Name	Severity	Specification	Message
mandatory attributes		[id]	

### OPERATION – PATCHUSAGESPECIFICATION

#### Description

This operation is used to partially update the representation of a usageSpecification.

#### Business Rules

Name	Severity	Specification	Message
can be updated		[status - in study, in design, in test, rejected, active, launched, retired, obsolete description validFor usageSpecCharacteristic usageSpecCharacteristicValue]	
cannot be updated		[id href]	
mandatory attributes		[id]	

## BUSINESS SERVICE – USAGE REST SERVICE



Figure 8. Usage Business Service

### OPERATION – POSTUSAGE

#### Description

This operation is used to create a usage.

#### Business Rules

Name	Severity	Specification	Message
mandatory attributes		[date type usageCharacteristic.name usageCharacteristic.value relatedParty.role if usage.status = "rated" or "billed" then ratedProductUsage.ratingDate ratedProductUsage.taxIncludedRatingAmount ratedProductUsage.taxExcludedRatingAmount ratedProductUsage.taxRate ratedProductUsage.currencyCode ratedProductUsage.productRef]	

		if usage.status = "rated" or "billed" then ratedProductUsage.usageRatingTag = "usage" ratedProductUsage.isBilled = false ratedProductUsage.ratingAmountType = "total" ratedProductUsage.isTaxExempt = false ratedProductUsage.offerTariffType = "normal"]	
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## OPERATION – GETUSAGE

### Description

This operation retrieves a usage.

### Business Rules

Name	Severity	Specification	Message
mandatory attributes		[id]	

## OPERATION – GETUSAGES

### Description

This operation is used to retrieve a collection of usages.

## OPERATION – PUTUSAGE

### Description

This operation is used to completely update the representation of a usage.

### Business Rules

Name	Severity	Specification	Message
mandatory attributes		[id]	

## OPERATION – PATCHUSAGE

### Description

This operation is used to partially update the representation of a usage.

### Business Rules

Name	Severity	Specification	Message
can be updated		[date type description usageSpecification usageCharacteristic status - received, rejected, recycled, guided, rated, rerated, billed relatedParty ratedProductUsage]	
cannot be updated		[id href]	
mandatory attributes		[id]	

## HUB BUSINESS SERVICE

The notification events supported by Usage Management are:

- o Usage update
- o UsageSpecification update

The Event is published to the registered listener

REST Example:  
POST client/listener

## BUSINESS SERVICE – USAGE HUB REST SERVICE

### OPERATION – REGISTERUSAGELISTENER

#### Description

This operation is used to register a Usage listener to be notified of the following events: Usage update, UsageSpecification update.

#### Business Rules

Name	Severity	Specification	Message
mandatory attributes		[description severity type]	

### OPERATION – UNREGISTERUSAGELISTENER

#### Description

This operation is used to unregister a Usage listener.

#### Business Rules

Name	Severity	Specification	Message
mandatory attributes		[description severity type]	