TM Forum Standard

Information Framework (SID)

Customer Domain Business Entities

Information Framework Suite

GB922 Customer Business Entities

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Notice

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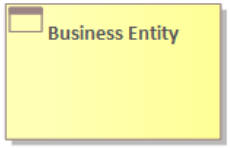
1 General Information

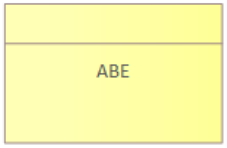
To find the Information framework figure, refer to “GB991 Core Frameworks Concepts and Principles” guidebook.

2 Typographic Conventions

- Relationships starting by a “/” correspond to shortcut and represent navigation relationships (aka derived relationship). A derived relationship corresponds to several relationships replaced by a unique derived relationship to give a synthetic view. It isn’t needed to implement such relationships.
- In diagrams, on Business Entities from a different ABE than the ABE being referred to in the diagram, the name after “from” represents the ABE where the Business Entity is located.
- A Business Entity is represented by a *decorator* located to the top left.



- The Aggregated Business Entity (ABE) is represented similarly to ArchiMate.



3 Glossary

Name	Description
ABE	Aggregate Business Entity
BE	Business Entity
eTOM	enhanced Telecom Operation Map (TMF Framework)
ODA	Open Digital Architecture
SID	Shared Information Data model (TMF Framework) is the previous name of Information Framework
TAM	Telecom Applications Map (TMF Framework) is the previous name of Application Framework

4 Customer Domain

The Customer domain represents roles, information and activities carried out by parties (e.g. individuals / organizations) playing roles that are involved in the management of and all types of contact with customers as they acquire, use, pay for and are supported for goods and services (i.e. products) that they obtain from an enterprise. Activities include: Strategy to Readiness (e.g. customer strategies, capabilities, customer lifecycle management) and Operations (e.g. customer relationship management , data, privacy, interactions, communications, orders, accounts, balances, service level agreements (SLAs), training, problems, cases, invoices, payments, disputes, collections, loyalty, performance, usage statistics, analytics and support).

Note: Some changes have been done in the Customer Domain in SID 17.0. These changes aim at removing attributes and entities from existing Customer domain ABEs and using equivalent Party domain ABE attributes and entities. The conformance to Customer domain ABEs' entities/attributes now must include mapping to Party domain ABEs' entities/attributes. These are shown in Customer guidebook figures. And the past conformance is not impacted, although any conformance done in the past should note that some Customer domain ABEs' entities/attributes have been replaced by equivalent Party domain ABEs' entities/attributes. For example, the customer credit profile entities have been replaced by references to equivalent party credit profile entities.

[CuD-01] Customer ABEs Level 1

The diagram below lists the Customer Domain's ABEs.

Customer Party Roles ABE

- The Customer Party Roles ABE contains all PartyRoles related to the Customer Domain such as Customer, Buyer or Customer Service Representative.

Customer Product Order ABE

- The Customer Product Order ABE handles single customer product orders and the various types thereof, such as regulated and non-regulated orders. It contains all information needed to procure Products by a Customer.

Customer Service Level Agreement ABE

- The Customer SLA ABE is a special case of the Service Level Agreement ABE where an involved party in the agreement is a Customer.

Customer Interaction ABE

- The Customer Interaction ABE represents communications with customers, and the translation of customer requests and inquiries into appropriate “events” such as the creation of a customer product order, the creation of a customer bill inquiry, or the creation of a customer problem.

Customer Problem ABE

- The Customer Problem ABE focuses on technical assistance and problem handling for customers.

Applied Customer Billing Rate ABE

- The Applied Customer Billing Rate ABE represents charges or credits assigned to the customer’s billing account in the course or for the purpose of the billing process.

Customer Bill ABE

- The Customer Bill ABE represents the specification of different formats of CustomerBill, the schedule of the production of bills and the Customer Bills themselves.

Customer Bill Collection ABE

- The Customer Bill Collection ABE handles Customer payments to the CSP and actions for overdue debts.

Customer Billing Account ABE

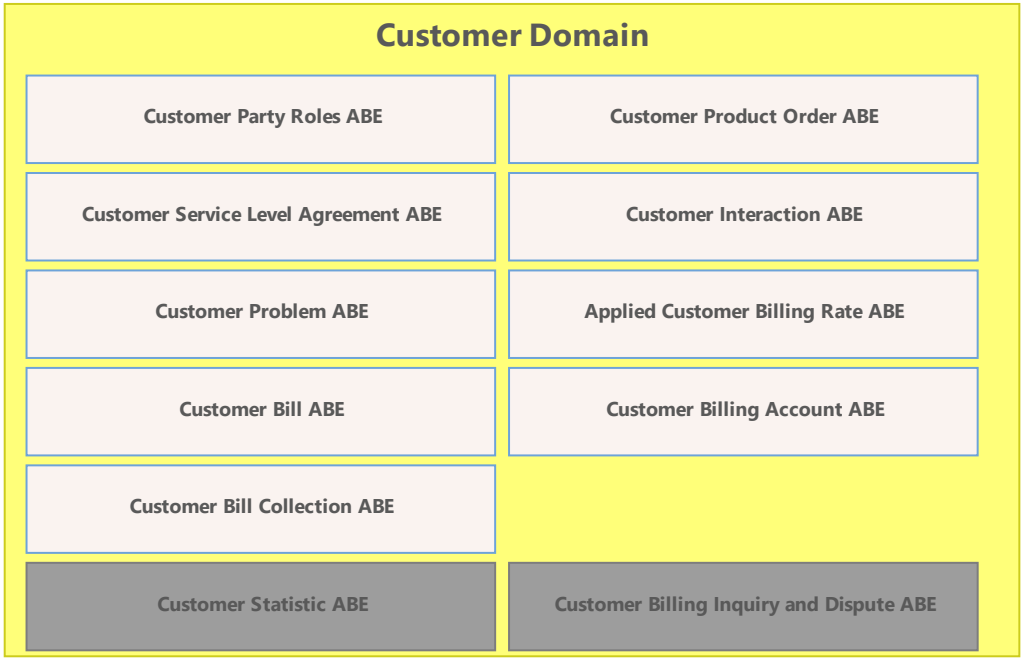
- The Customer Billing Account ABE groups the classes concerned with the CustomerBillingAccount, i.e. the billing structure, billing cycles.
- The Customer Billing Account receives all charges (recurring, one time charge and usage) of the ProductOfferingInstances and Products assigned to it.

Customer Bill Inquiry ABE (not fully developed)

- The Customer Bill Inquiry ABE represents requests for information associated with invoices sent to the Customer.

Customer Statistic ABE (not fully developed)

- The Customer Statistic ABE represents the analysis of customer usage patterns, customer profitability statistics and churn and retention statistics.



[CuD-01] Customer ABEs Level 1

[CuD-02] Customer ABEs Level 1 & 2

The diagram below lists the Customer Domain's ABEs Level 1 and Level 2.

Customer Billing Statistic ABE

- The Customer Billing Statistic ABE represents collected data derived from CustomerBills.

Applied Customer Billing Rate Spec ABE

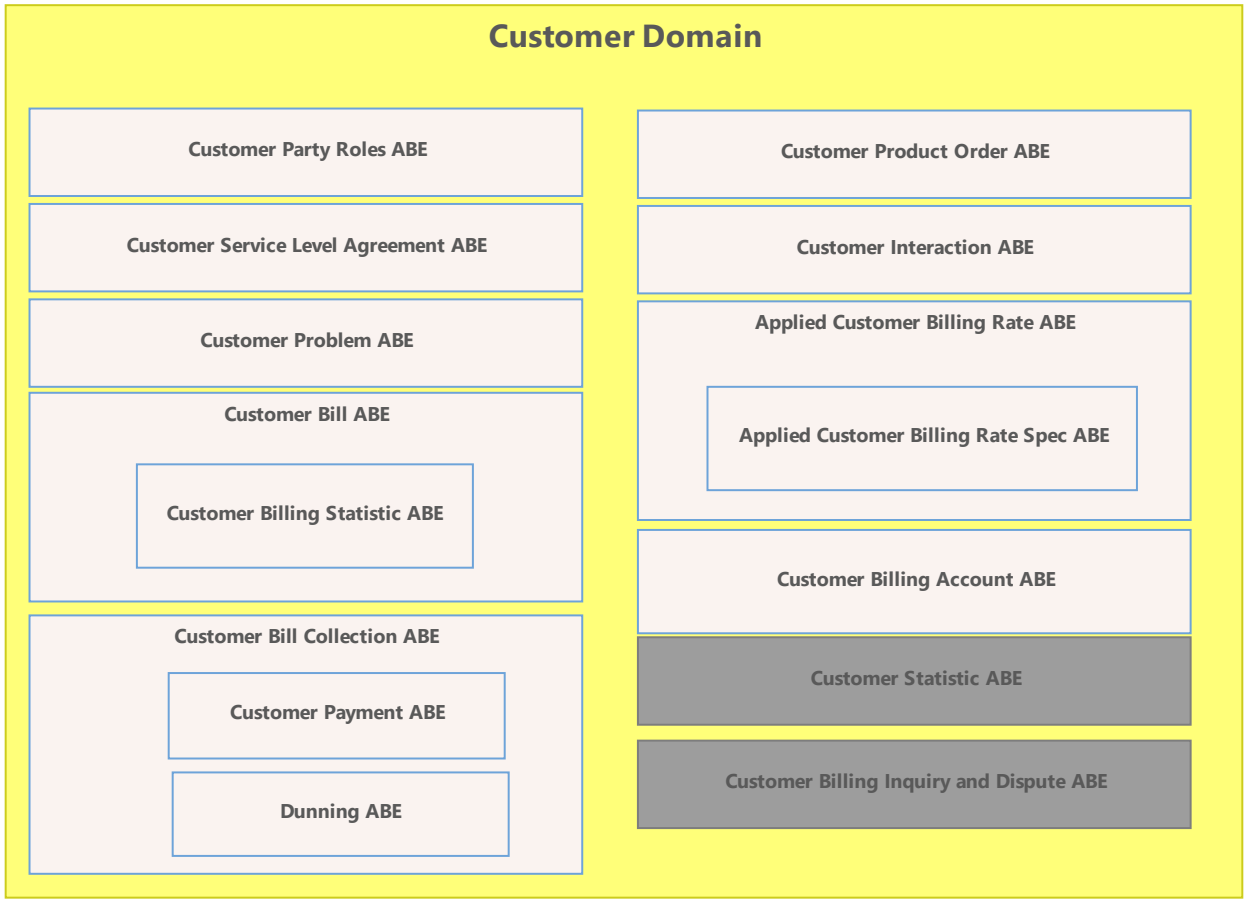
- The Applied Customer Billing Rate Spec ABE is detailed description of AppliedCustomerBillingRate entity.

Customer Payment ABE

- The Customer Payment ABE represents the transfer of wealth from a customer for a product or usage of product.

Dunning ABE

- The Dunning ABE represents attempts to collect payment from a customer for overdue payments.



[CuD-02] Customer ABEs Level 1 & 2

[CuD-03] Customer main BEs

The diagram below lists the Customer Domain's ABEs and presents in each ABE the main Business Entities and relationships between these entities.

Customer Party Roles ABE

- The Customer represents a Party (person or legal entity or part of a legal entity) that has a contractual relationship with the CSP by buying ProductOfferingSpecifications. A Customer is a type of PartyRole and may be the Holder, the User, the Payer…
- A Customer may order offers and products through CustomerOrders.
- A customer may pay for one or several CustomerBillingAccounts.

Customer Bill ABE

- A CustomerBillingAccount is an entity that receives all charges (recurring, one-time charge and usage) of the Products assigned to it and logs accounting events on a FinancialAccount (financial entity).
- According to the billing cycle, CustomerBills are produced for a CustomerBillingAccount.
- Between two billing cycles, AppliedCustomerBillingRates are calculated and assigned to a CustomerBillingAccount.
- An AppliedCustomerBillingRates is an amount, usually of money, for which a Party is financially liable and may be recurring, non-recurring or usage charge.

Customer Problem ABE

- When a Customer has a problem and points it out, a CustomerProblem is traced.

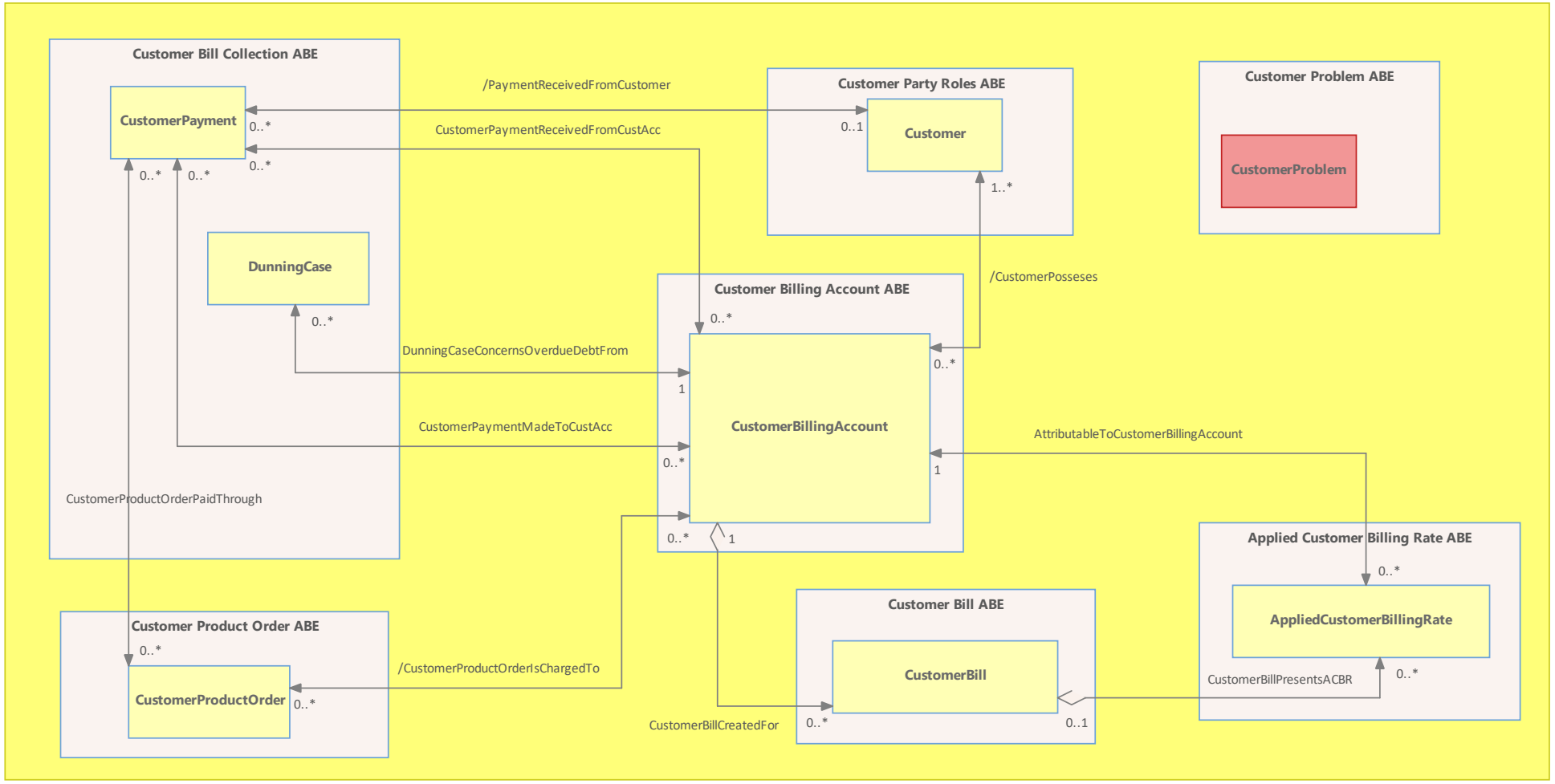
Customer Bill Collection ABE

- When a Customer enters a dunning process, i.e. he has not paid his invoice, a DunningCase is created. At the beginning, this DunningCase concerns the debt of his CustomerBillingAccount and it contains all details pertaining to the debt. Later if the debt is still not covered, the DunningCase will concern the FinancialAccount.

- A CustomerPayment is received from a Customer and may concern many CustomerBillingAccounts.

Customer Product Order ABE

- A CustomerProductOrder orders ProductSpecification through ProductOfferingSpecifications and concerns Products and PoductOfferingInstances.



[CuD-03] Customer main BEs

4.1 Customer Party Roles ABE

The **Customer Party Roles ABE** is the focus on all the PartyRoles related to Customer such as Customer, Buyer or even Customer Service Representative.

Figure C.00 - Customer Party Roles

The Customer Domain party roles presently identified are:

- Customer: A person or organization that buys products from the enterprise or receives free offers or products. This is modelled as a Party playing the role of Customer. A Customer is a type of PartyRole. Customers can also be other service providers who resell the enterprises products, other service providers that lease the enterprise's resources for utilization by the other service provider's products and services, and so forth.
- Buyer: A PartyRole played by a Party, who imposed a Supplier to provide a deliverable by a formal Agreement (Commitment).
- CustomerServiceRepresentative: Agreed & done: CustomerServiceRepresentative (CSR) is an Employee from the Operator or Dealer. A CSR is in charge of customer relationship, may act on behalf of the customer for sales and in support of the customer.

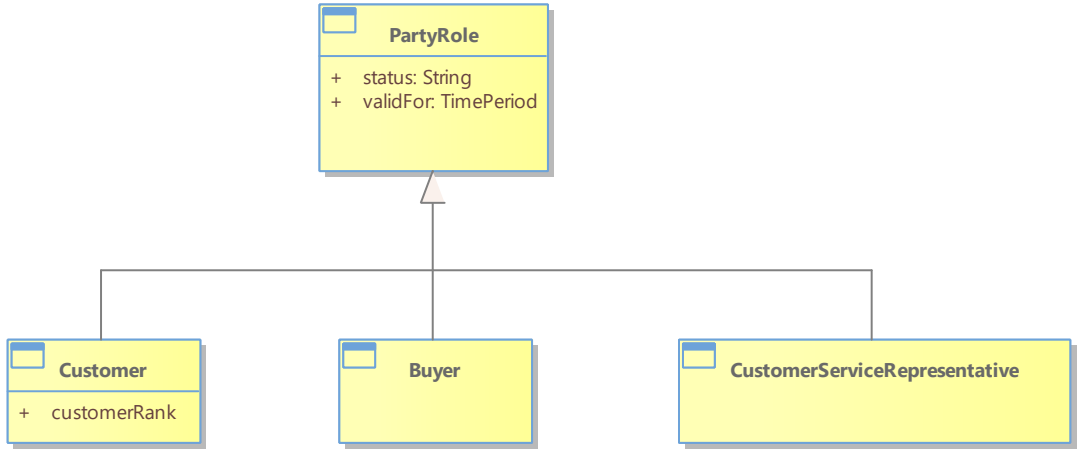


Figure C.00 - Customer Party Roles

Figure C.01 - Customer as a Type of Party Role

Customers are at the center of any enterprise. Without customers at some point in its like, an enterprise cannot exist. Within the SID model, quite a bit of what is normally thought of as customer data resides within the Party business entity. This data includes attributes that describe individuals and organizations, such as name, address, phone, fax, email, and other contact information. More specifically, the role object model is used to abstract the notion of a "customer" into a specific subclass of PartyRole, which is documented in GB922 Party Guide Book. This is shown in Figure C.01 below.

This makes the Customer model inherently extensible. Customers can be conceptualized as an Individual, a group of people, or an organization. By making Customer a subclass of PartyRole, the SID avoids "hard-wiring" specific people or organizations as "customers". Rather, the SID enables Customer to be one of possibly many roles played.

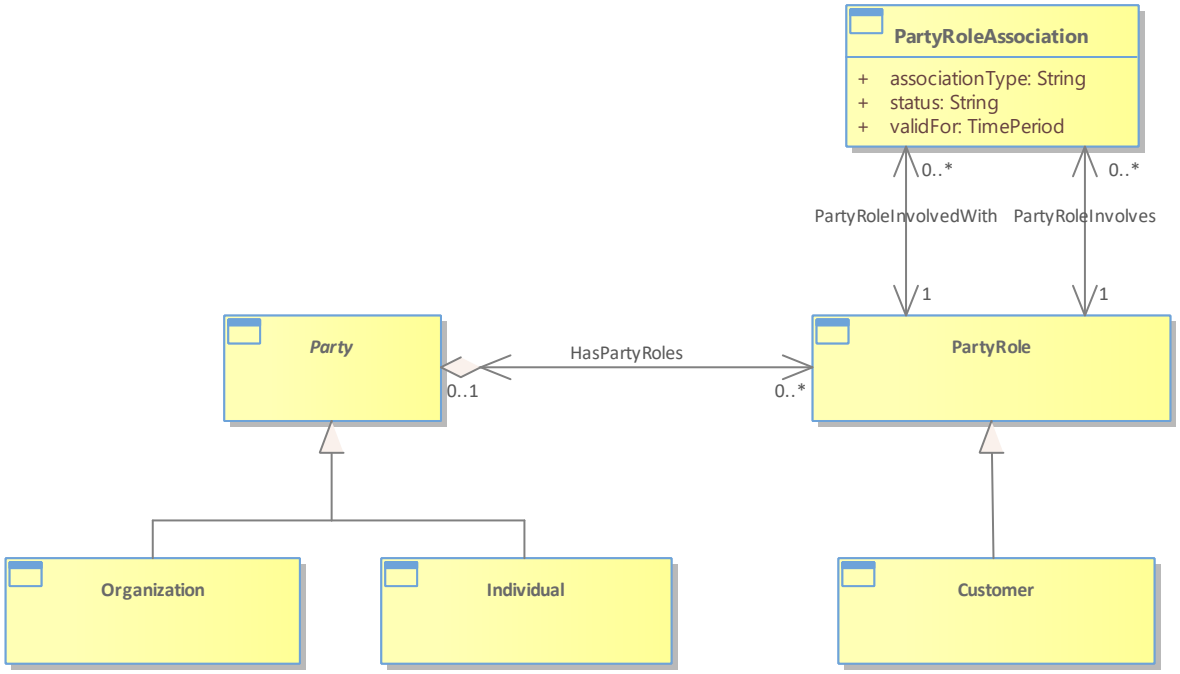


Figure C.01 - Customer as a Type of Party Role

Figure C.02 - Customer Business Entities

The Following Figure “C.02 – Customer Business Entities” presents the Customer main entities.

The primary business entities in the Customer Data model are Customer and Customer Account. Additional business entities, unique to a given enterprise, can be added to extend this model.

A Customer may possess one or many CustomerBillingAccounts.

A CustomerBillingAccount is an arrangement that a Customer has with an enterprise (such as a communication service provider) through which the enterprise collects AppliedCustomerBillingRate (i.e. charges) to structure bills. It also collects payments for Products that are supplied by the enterprise to the Customer. The AppliedCustomerBillingRates are invoiced to the CustomerBillingAccount via CustomerBills.

A CustomerBillingAccount is a type of Account.

A Customer might be evaluated for its worthiness (PartyCreditProfile) and this evaluation might be based on external information (PartyCreditProfileReference).

The AccountContact qualifies for an Account a contact point (PartyRole and ContactMedium) such as primary, secondary, and emergency contact.

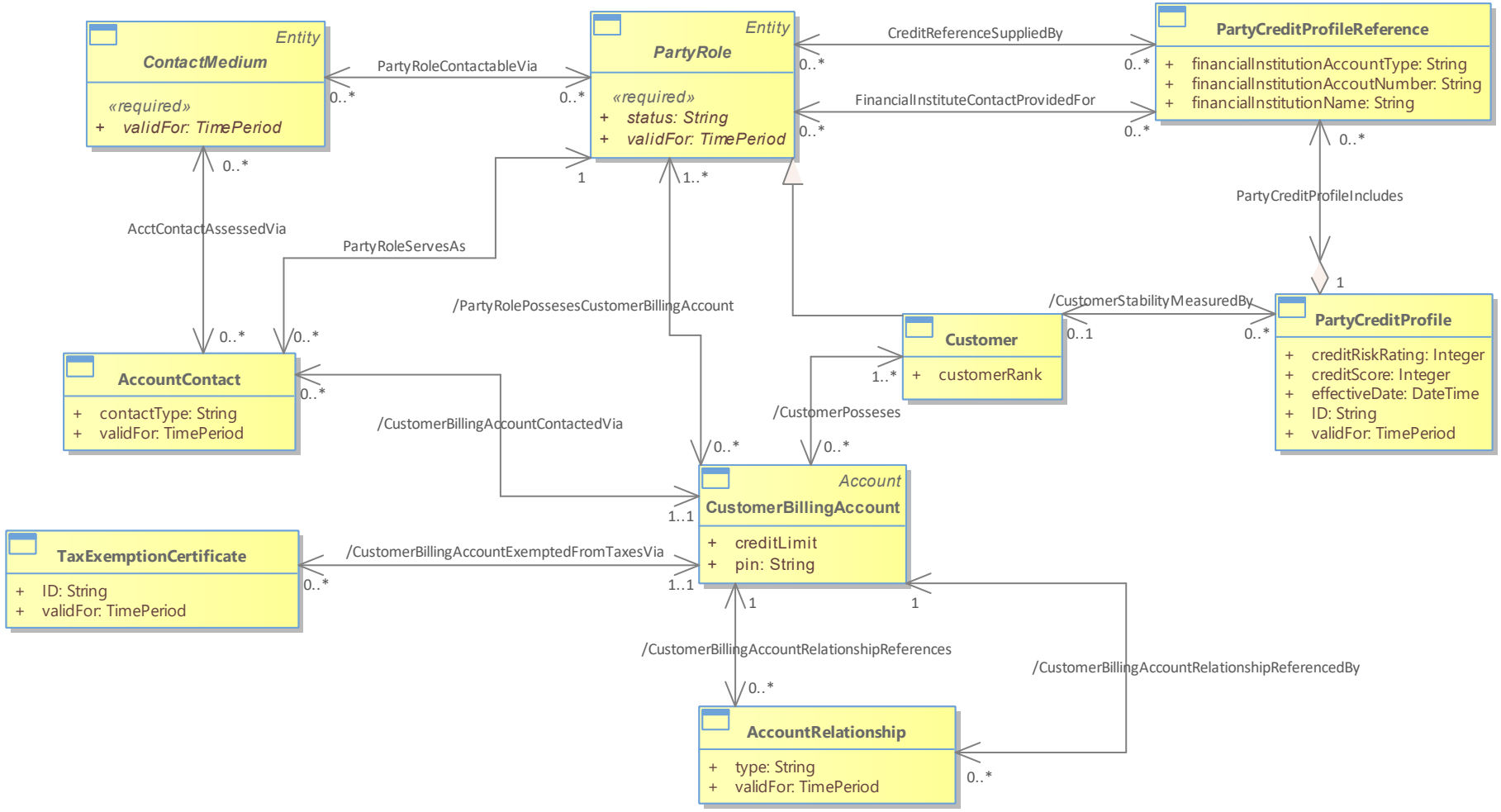


Figure C.02 - Customer Business Entities

4.2 Customer Product Order ABE

The **Customer Product Order ABE** handles single customer product orders and the various types thereof, such as regulated and non-regulated orders. It contains all information needed to procure Products by a Customer.

Note: Some but not all enterprises consider an Order to be a type of an Agreement. From a SID model perspective, an Order can be formalized by an Agreement and the Agreements relationship between the Agreement and the ProductOrder. This philosophy has the advantage of clearly separating two different concepts: the order from the legal formalisms associated with the order. For example, several orders may refer to the same Agreement.

Figure C.03 - Customer Product Order Business Entities

A Customer might place orders with the Service Provider. This is represented by the CustomerProductOrder.

CustomerProductOrder / CustomerProductOrderItem are sub-classes from the pattern ProductOrder / ProductOrderItem. For further details about ProductOrder / ProductOrderItem refer to the Common Domain guide book section Product Order ABE.

A ProductOrder represents a request used to procure, update or remove one or many Products in the context of a ProductOfferingSpecification through all its ProductOrderItems.

The particularity of the CustomerProductOrder is to procure, update or remove Products and ProductOfferingInstances for Customer even if, for example, the CustomerProductOrder might be placed by the Service Provider when applying precautionary measures in case of bad debt.

At least one CommunicationInteraction is the source of a CustomerProductOrder. Then, additional interactions might happen such as the Customer asking why his order isn't yet delivered or the Service Provider informing the Customer his order is completed.

A CustomerProductOrder uses a SalesChannel to be requested.

A CustomerProductOrder might refer to an Agreement specifying all what has been approved by the PartyRoles involved in the CustomerProductOrder.

One or many PartyRoles might be involved in a CustomerProductOrder / CustomerProductOrderItem such as Distributor, Holder, Buyer, Product User or DeliveryDriver.

The CustomerProductOrder and CustomerProductOrderItems may specify the CustomerBillingAccount to which the ProductsOfferingInstances' are charged to.

When CustomerProductOrder / CustomerProductOrderItems are not charged to a CustomerBillingAccount and carry one-time charges, they might be directly paid through one or many CustomerPayments.

A CustomerProductOrderItem may need other CustomerProductOrderItems to be completed; this dependency is represented through the "/CustomerProductOrderItemRefrencesReferencedBy" relationship. For example, using this relationship you can specify that CustomerProductOrderItem "2 hours call bundle" requires CustomerProductOrderItem "Mobile Line".

A CustomerProductOrder and CustomerProductOrderItems might be further described by Attachments.

Relationships with SalesChannel, CustomerBillingAccount and CustomerPayment are not shared with Business Partner orders.

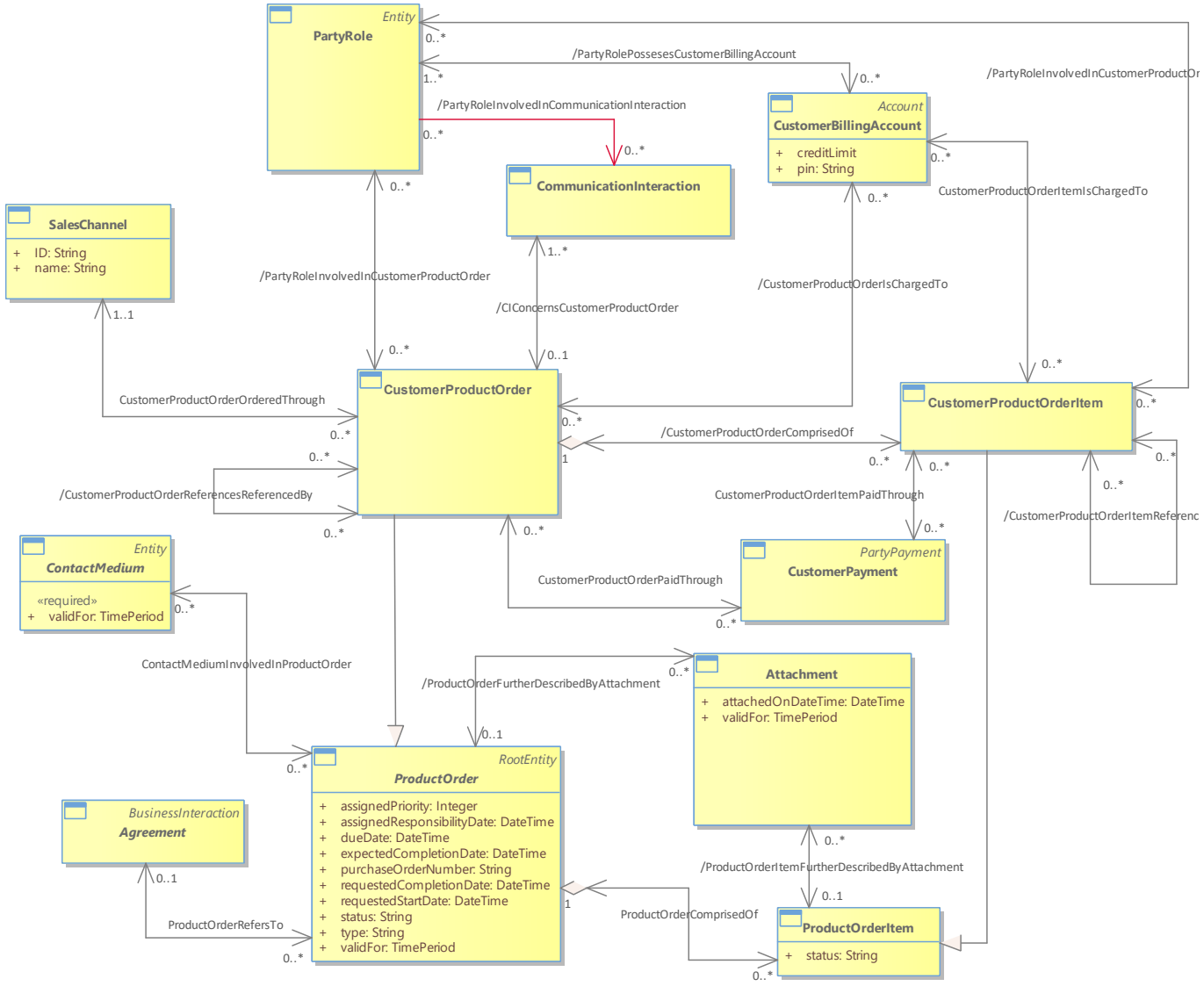


Figure C.03 - Customer Product Order Business Entities

Figure C.03a - Customer Product Order Item Business Entities

One or many PartyRoles might be involved in a CustomerProductOrder / CustomerProductOrderItem such as Distributor, Holder, Buyer or Product User.

Each CustomerProductOrderItem requires an action (AllowedProductAction) on a ProductSpecification or a ProductOfferingSpecification.

The configuration required is described by the related Product even if it isn't delivered yet. The prices applicable are related to the ProductOfferingInstance (ProductPrice) or to ProductOrderItem / PorductOrder when it corresponds to prices not specific to a Product such as a global of 5% on ProductOrder one-time fees.

To deliver the corresponding Product, the Place to deliver and Appointment(s) might be needed. An Appointment is an arrangement to do something or meet someone at a particular time and location.

A CustomerProductOrderItem may also specify the commitment chosen by the Customer (i.e. CommitmentTermOrCondition).

The CustomerProductOrderItems may specify the CustomerBillingAccount to which the ProductOfferingInstances' are charged to.

When CustomerProductOrderItems are not charged to a CustomerBillingAccount and carry one-time charges, they might be directly paid through one or many CustomerPayments. The same CustomerPayment may concern several ProductPrices.

CustomerProductOrderItem may reference ServicOrderItems or ResourceOrderItems that participate in the Product required delivery.

Relationships with ServicOrderItem, ResourceOrderItem, CustomerBillingAccount and CustomerPayment are not shared with Business Partner orders.

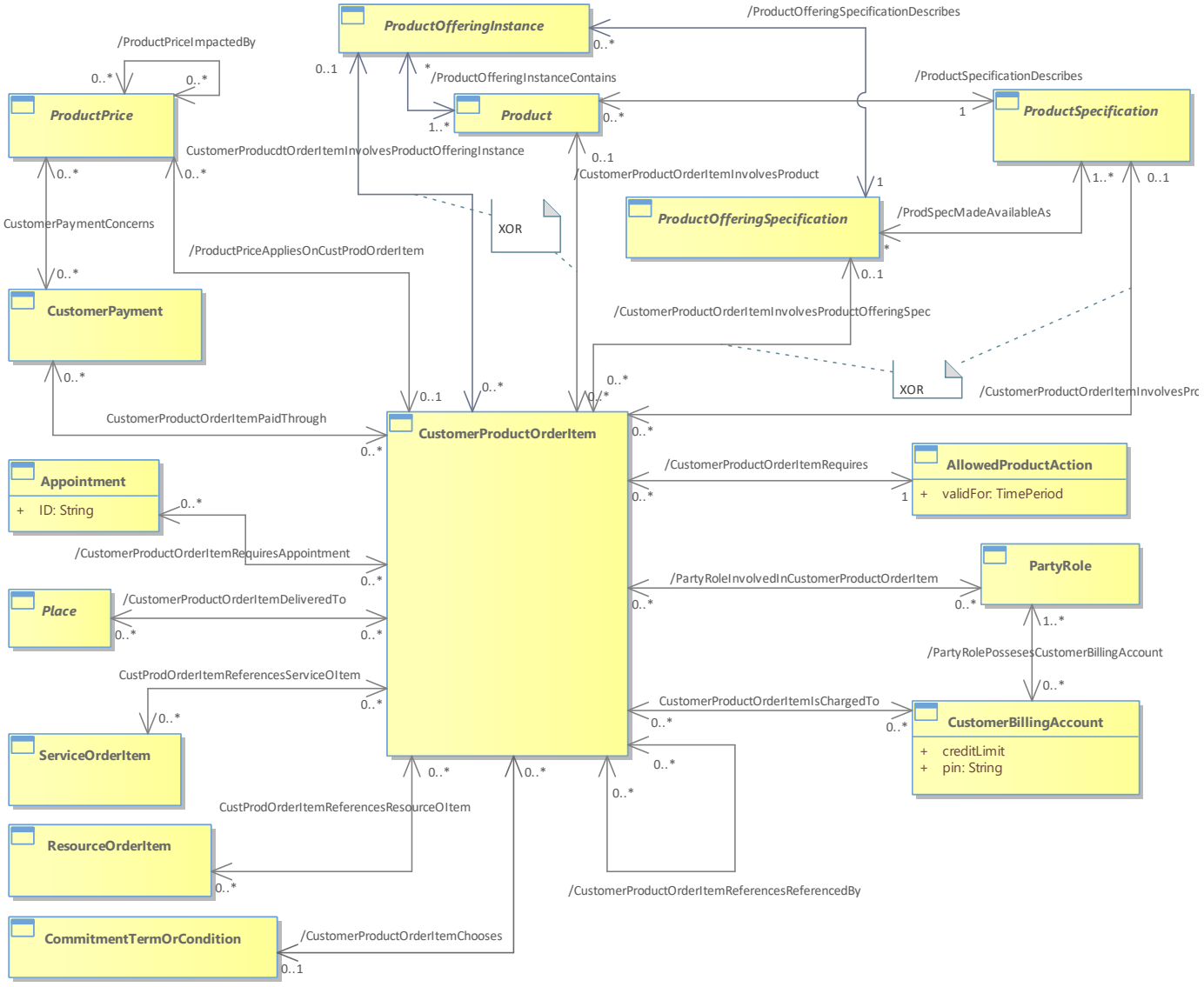


Figure C.03a - Customer Product Order Item Business Entities

Figure C.03b - Shopping Cart and Shopping Cart Item Business Entities

ShoppingCart looks like CustomerProductOrder except relationships with BillingAccount, Payment and SalesChannel that do not exit for ShoppingCart.

In the same way ShoppingCartItem looks like CustomerProductOrderItem except elationships with BillingAccount and Payment that do not exit for ShoppingCartItem.

It isn't mandatory to use ShoppingCart, CustomerProductOrder is enough to cover all the Customer Order Handling process. But some CSP might prefer to keep the view of what the customer decided to buy seperated from the final order. In this case, we can instanciate an instance of ShoppingCart and when the customer is identified, instanciate a CustomerOrder refering to the ShoppingCart.

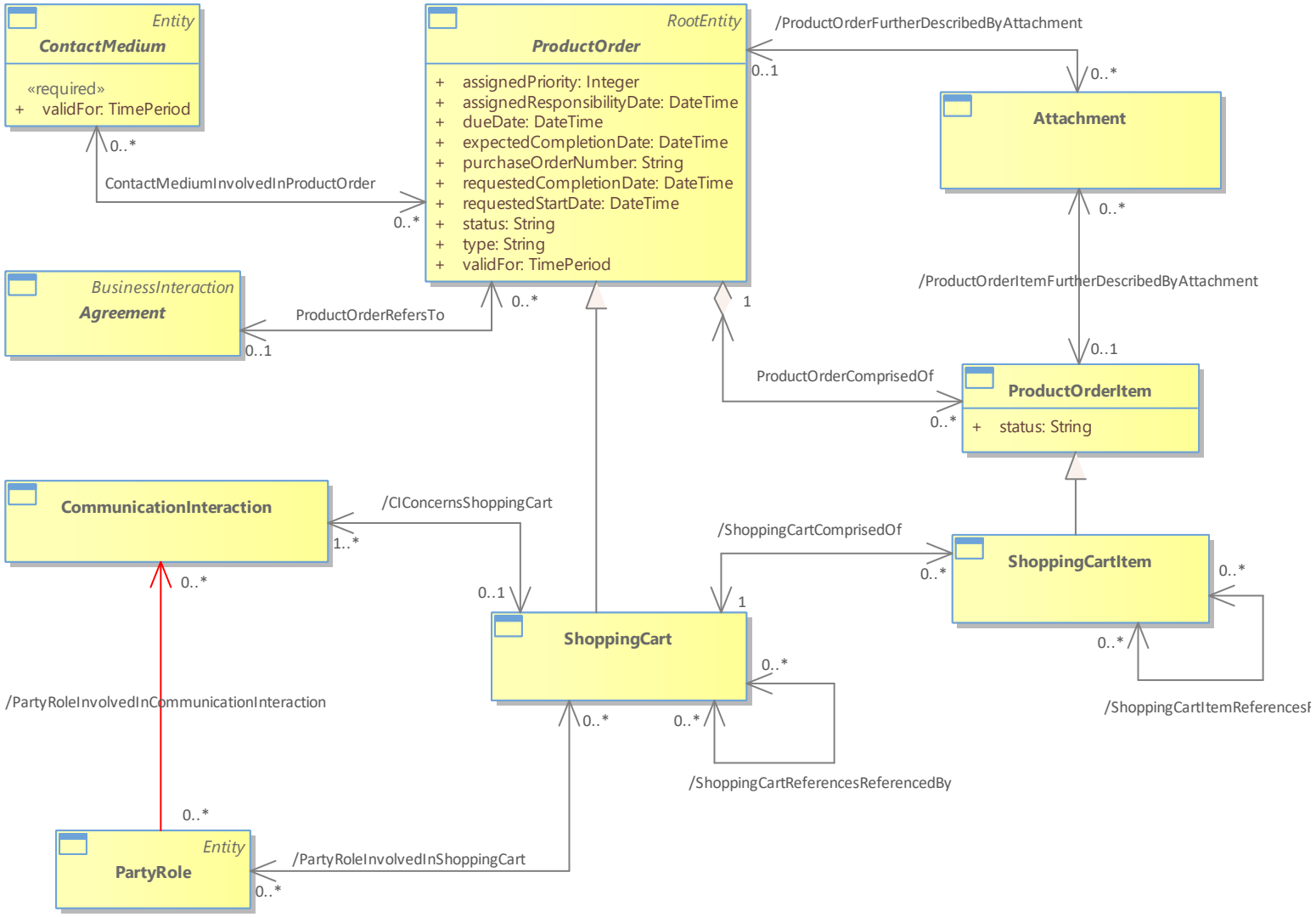


Figure C.03b - Shopping Cart and Shopping Cart Item Business Entities

Figure C.03c - SalesQuote overview (copy of Figure SLO.03)

A SalesOpportunity may lead to one or many SalesQuotes.

A SalesQuote is a document that allows a Prospect to view the cost involved in purchasing specific Products. It is generally used by suppliers or resellers to begin a business transaction and specifies validity period for acceptance of the quote and possibly an authorisation process depending on the value of the quote.

For specifying Products and ProductOfferingInstances proposed, their configuration and the related cost, the SalesQuote proposes one or many CustomerProductOrders.

A SalesQuote might be described by a SalesQuoteSpecification.

SalesQuoteSpecification is used to define the common characteristics (attributes, constraints and relationships) of a SalesQuote i.e. CSP would have a pre-defined template (specification) to generate the quote for different customer segments &/or products.

- e.g. SalesQuote specification might be different depending on type of products. The quote specs for broadband products will differ from those for mobile.

- e.g. the SaleQuote specification might be different depending on the size of enterprise lead. The quote generated for SOHO (Small Office Home Office) may be in a different format to that for an SME (Small and Medium sized Enterprises).

- e.g. MPLS multi-protocol label switching. Though it is one overarching complex product it has multiple subtypes of products that should be included in the SalesQuote.

Each SalesQuoteSpecification might be categorized by one or many SalesQuoteSpecificationType.

To be able to propose a SalesQuote to the Prospect, it might need to be validated internaly by the CSP. This is tracked through a SalesQuoteAgreement and its related AgreementApproval.

A SalesQuote might be represented by one or many Attachement such as a document that might be sent to the Prospect through an email. Several Attachements might be associated to the same SalesQuote for example if the validPeriod of the SalesQuote is updated, a new attachement is generated.

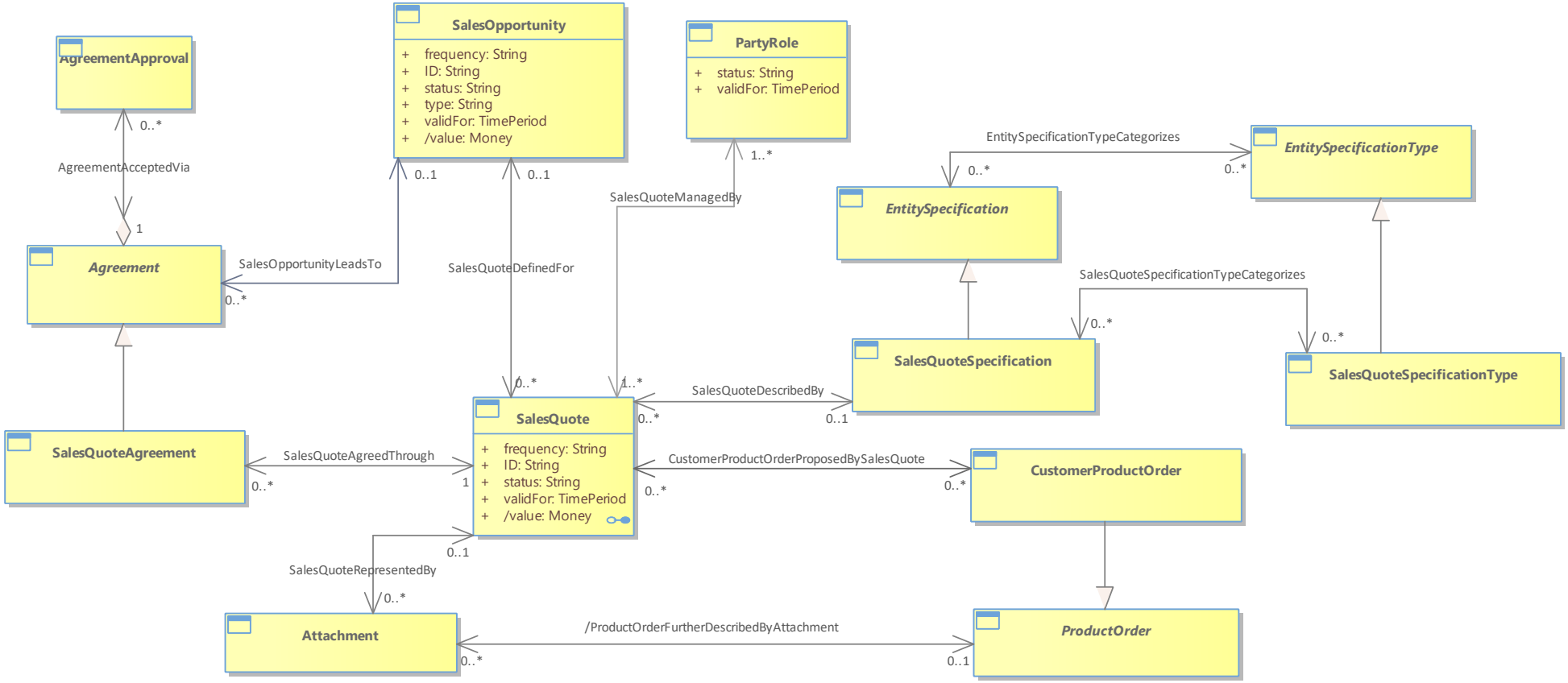
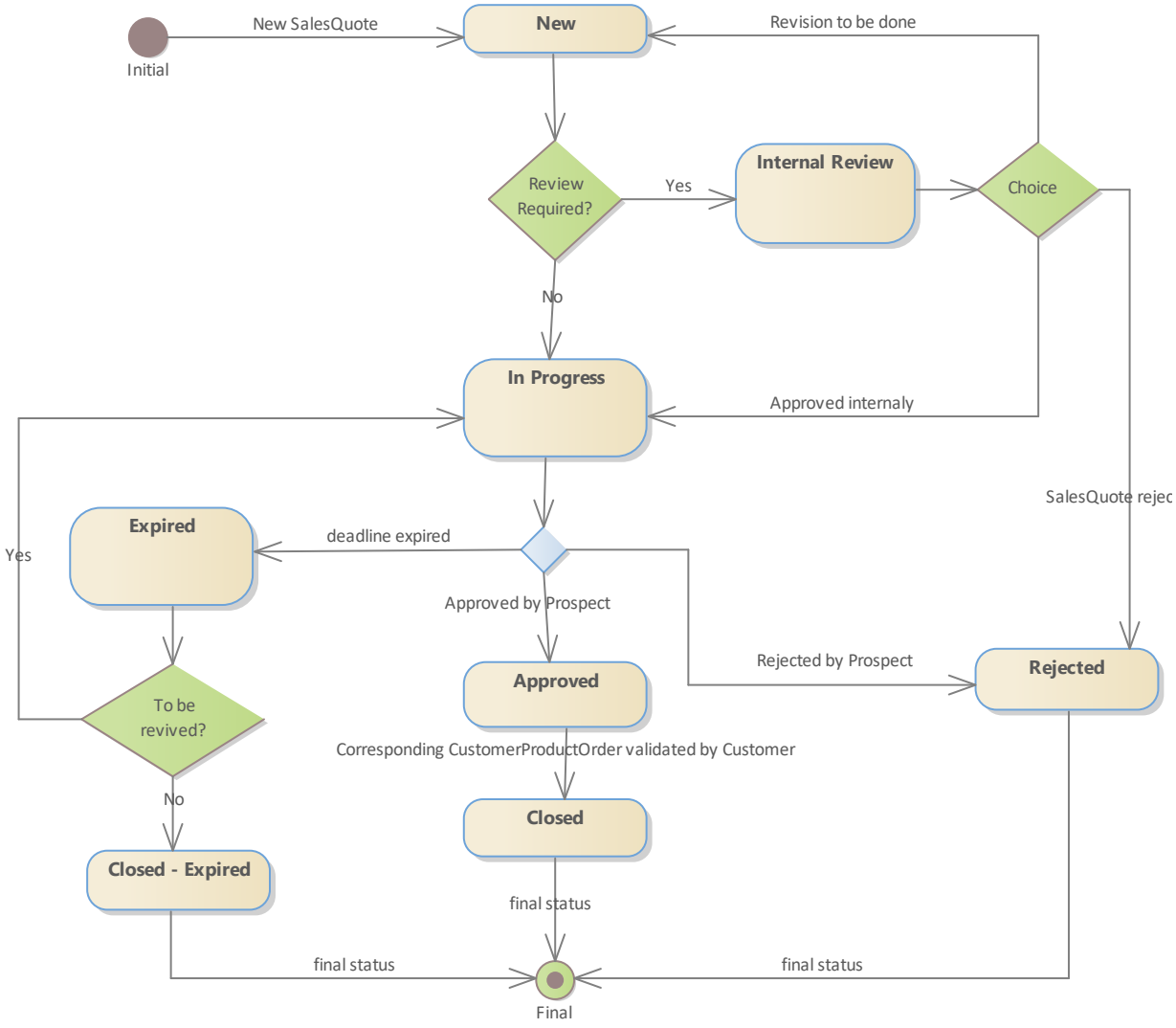


Figure C.03c - SalesQuote overview (copy of Figure SLO.03)

SalesQuote Lifecycle

- Start : The initial state of a newly created SalesQuote, at this point the quote is not considered valid to be placed in front of the Prospect.
- Internal Approval : If the Sales Quote does require an internal CSP approval process before to be placed in front of the Prospect. then it may be transitioned from New into Internal Approval to recognise the fact that the quote requires and is waiting for the approval process to complete. The business object for quote may contain a reference to the Approval business object that represents the management of this process.
- In Progress : The quote is in progress state when the user saves a quote after it is created. This is the state after the Internal Approval state if required.
- Approved : If the Sales Quote has been approved internally if required and also by the prospect/customer then it may be transitioned into the Approved state, which makes it valid with regard to placing in front of the Prospect for the final Quote journey.
- Rejected : If the newly created Sales Quote is not required or if it is not deemed appropriate, may be as part of the approval process then it may be transitioned into the terminating state of Rejected. In this state it may not be recovered, instead a new quote would have to be created.
- Expired : The quote expires if the quote expiry period is reached. The quote can be revived at this stage and moved to be in progress again.
- Closed - Expired : The quote expires if the quote expiry period is reached and can not be revived after this stage.
- Closed : The Prospect/Customer has been shown the quote and has decided to purchase the Products. The Sales Quote has therefore generated one or more CustomerProductOrders.



SalesQuote Lifecycle

4.3 Applied Customer Billing Rate ABE

The **Applied Customer Billing Rate ABE** represents charges or credits assigned to the customer's billing account in the course or for the purpose of the billing process.

Figure C.12 - Applied Customer Billing Rate overview

The AppliedCustomerBillingRate business entity represents an applied billing rate assigned to the CustomerBillingAccount.

AppliedCustomerBillingRates are created before or during the billing cycle by the rating or billing process. Its creation can be governed by ProductPriceRules.

Each applied billing rate is either atomic or composed of other applied rates. This is very useful for displaying AppliedCustomerBillingRates in the CustomerBill.

For Financial purposes, however, the composite/atomic pattern is inappropriate since the AppliedCustomerBillingRate may be aggregated more than once (see example in Figure CE.01) and therefore FinancialCharge is presented which aggregates each AtomicAppliedCustomerBillingRate exactly once for reporting to the financial systems.

The CompositeAppliedCustomerBillingRate represents the result of a sum or subtractions of one or more other applied rates. It is formed by aggregating other AppliedCustomerBillingRates (through sum or subtraction operation) that may be either Composite or Atomic AppliedCustomerBillingRates.

The main purpose of the CompositeAppliedCustomerBillingRate is to represent an aggregated view of comprising AppliedCustomerBillingRates that can be referenced by other AppliedCustomerBillingRates, for example, by AppliedCustomerBillingTaxRate.

AppliedCustomerBillingRate is described by AppliedCustomerBillingRateSpec, and it is associated with dynamic Characteristics. This is due to the fact that each type of AppliedCustomerBillingRate may carry different Characteristics based on service type, line of business or other parameters.

Each AppliedCustomerBillingRate is attributable to a unique CustomerBillingAccount. Before being billed it can be already assigned to a future billing cycle (PartyBillingCycle).

When it is billed, it is presented on a unique CustomerBill.

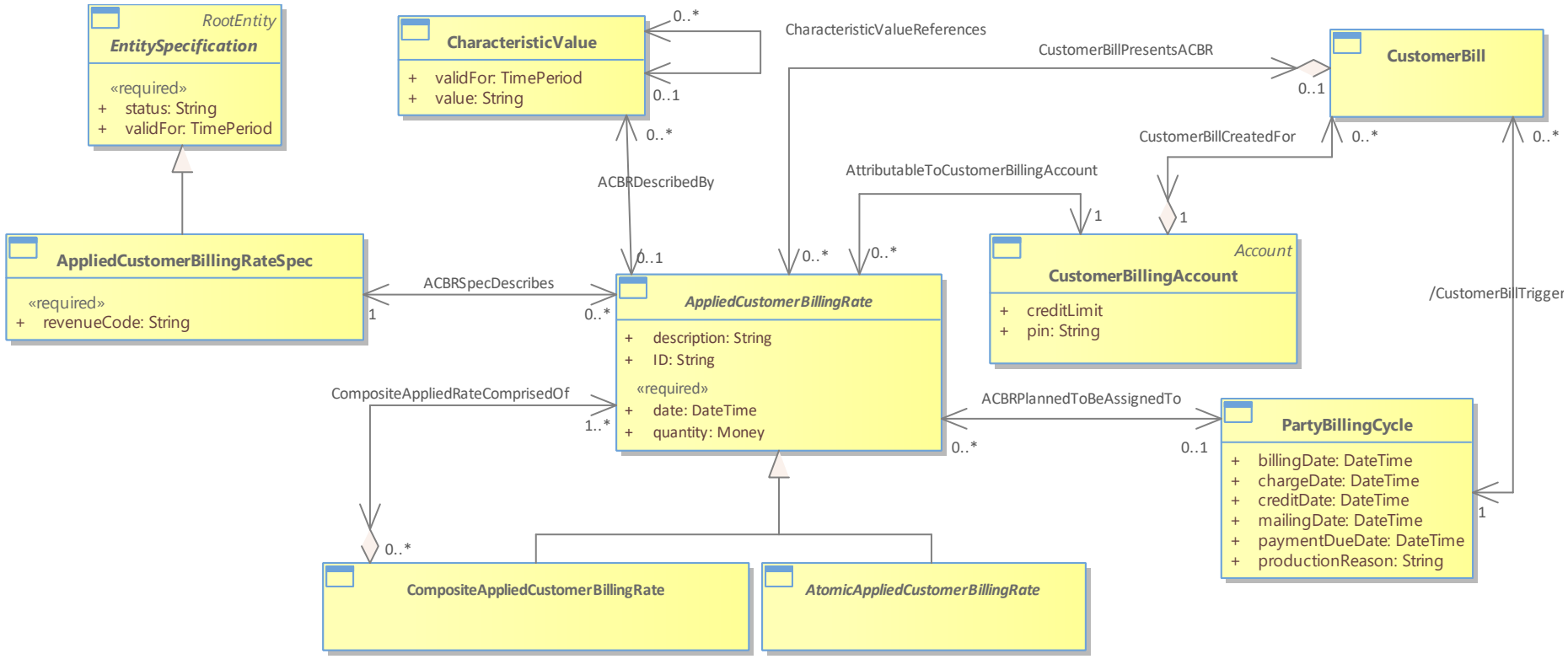


Figure C.12 - Applied Customer Billing Rate overview

Figure C.12a - Applied Customer Billing Rate detail

The AtomicAppliedCustomerBillingRate class has four subclasses:

- AppliedCustomerBillingCharge, that represents any kind of charge (except taxation charges);
- AppliedCustomerBillingCredit, that represents any kind of credit;
- AppliedCustomerBillingTaxRate, that represents a taxation charge;

The AppliedCustomerBillingCharge has two subclasses:

- AppliedCustomerFeeCharge that represents penalty charges such as late fees, payment rejection fees…
- AppliedCustomerBillingProductCharge that represents a charge applied to a Product

The AppliedCustomerBillingProductCharge has three subclasses:

- AppliedCustomerBillingProductUsageCharge represents the charge for a product usage event typically produced by a rating engine.
    - For example, when a customer makes a voice call a ServiceUsage instance representing call details is created. Afterwards the guiding process creates a ProductUsage instance that represents the ServiceUsage associated with the proper Product. Then the rating process applies a usage price to the ProductUsage instance and creates an AppliedCustomerBillingProductUsageCharge instance representing the price of the rated Product Usage.
- AppliedCustomerBillingProductRecurringCharge represents an amount, usually of money, for which an Individual or Organization is financially liable over recurring period (e.g. monthly) for the right to use a Product. For example, $15/month for basic TV channel access, $10/month for renting a home gateway, $3/month for extended warranty for an iPhone.
- AppliedCustomerBillingProductOneTimeCharge represents an amount, usually of money, for which an Individual or Organization is financially liable due to a one-time event relating to a Product. For example, $20 installation fee for a home gateway, $600 purchase price for an iPhone, $10 shipping fee for a router.

The AppliedCustomerBillingCredit has four subclasses:

- The AppliedCustomerBillingRebate represents an amount, usually of money, which is paid back to a customer's account, for example, because a customer is entitled to a refund. It refers globally to a CustomerBillingAccount or a specific CustomerBill. For example, it can correspond to 5% discount on the total amount of the previous CustomerBill or a good will of 100$ attributed by a seller to the CustomerBillingAccount.

- An AppliedCustomerBillAdjustment represents an adjustment of the invoices (CustomerBill) that were generated and provided to the Customer can be performed to solve a CustomerBillingDispute.

- An AppliedCustomerBillingChargeAdjustment is used to solve a CustomerBillingDispute that concerns one or several charges that were incorrect (example: a usage that was not properly rated). It will adjust the charged amount to the proper value.

- The AppliedCustomerBillingProductAlteration represents a modification of the referred applied product billing charge (either atomic or composite).

The AppliedCustomerBillingTaxRate represents taxes applied to billing charges. The entity may be linked to another applied rate (either atomic or composite rate) to indicate which applied rate it refers to. It is calculated during a billing process.

The presented model by no means represents the complete set of applied billing rates that can be incurred. The model provides a framework into which other types of applied billing rates can easily fit.

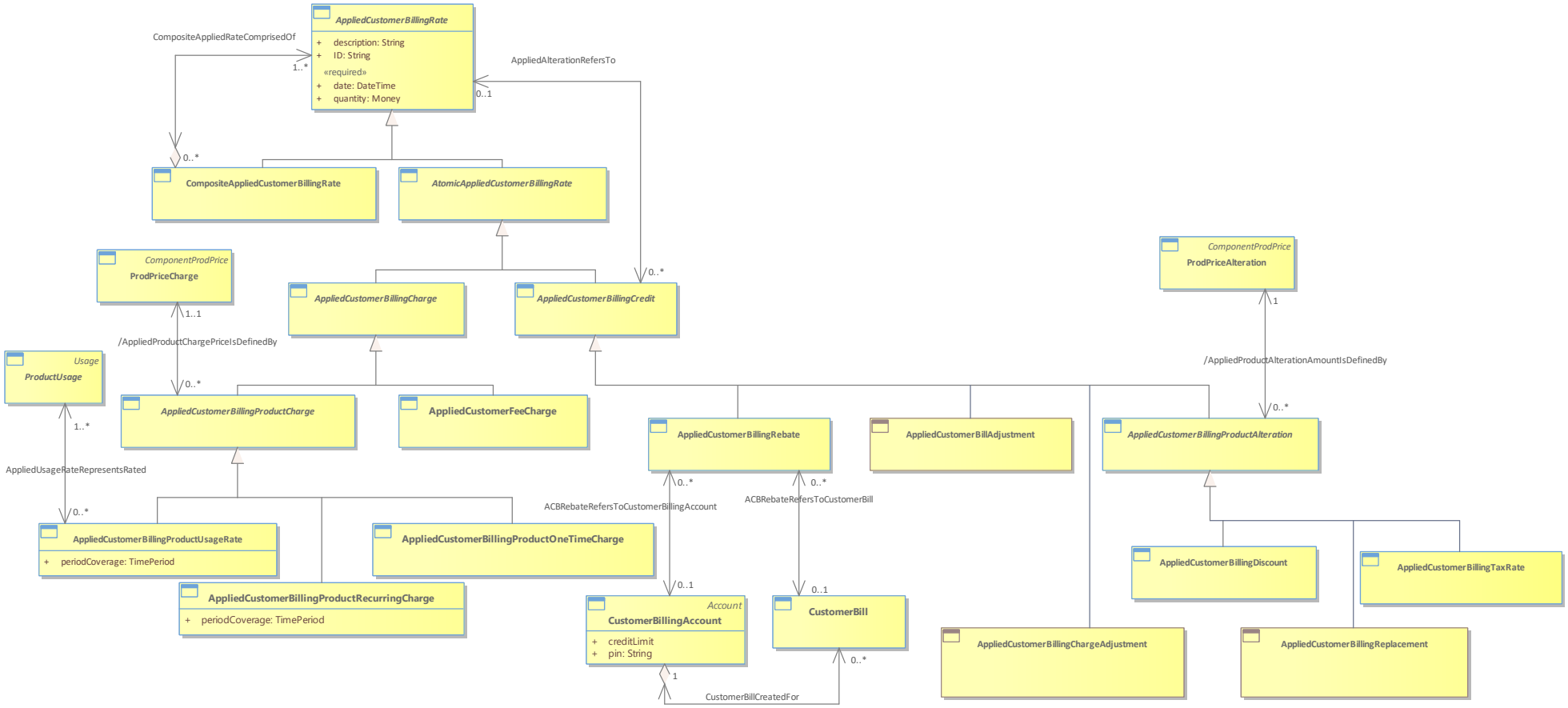


Figure C.12a - Applied Customer Billing Rate detail

Figure C.12-01 – Issues with Using Composite/Atomic Charges to Model Financial Reporting

The ultimate goal of any billing process is creation of a bill (an invoice). The bill is created during a customer account billing cycle and associated with a customer account.

For financial reasons it is critical that each AtomicAppliedCustomerBillingRate amount appears exactly once on each CustomerBill. This is not well supported by the atomic/Composite pattern as explained in the diagram.

For financial reasons we must report $0.88, however summing all these instances together gives us $2.56. If we sum, however, only the leaves of the tree (the AtomicAppliedCustomerBillingRates) we get exactly $0.88 ($1 - $0.2 + $.05 + $.03). Therefore the FinancialCharge business entity aggregates only AtomicAppliedCustomerBillingRate

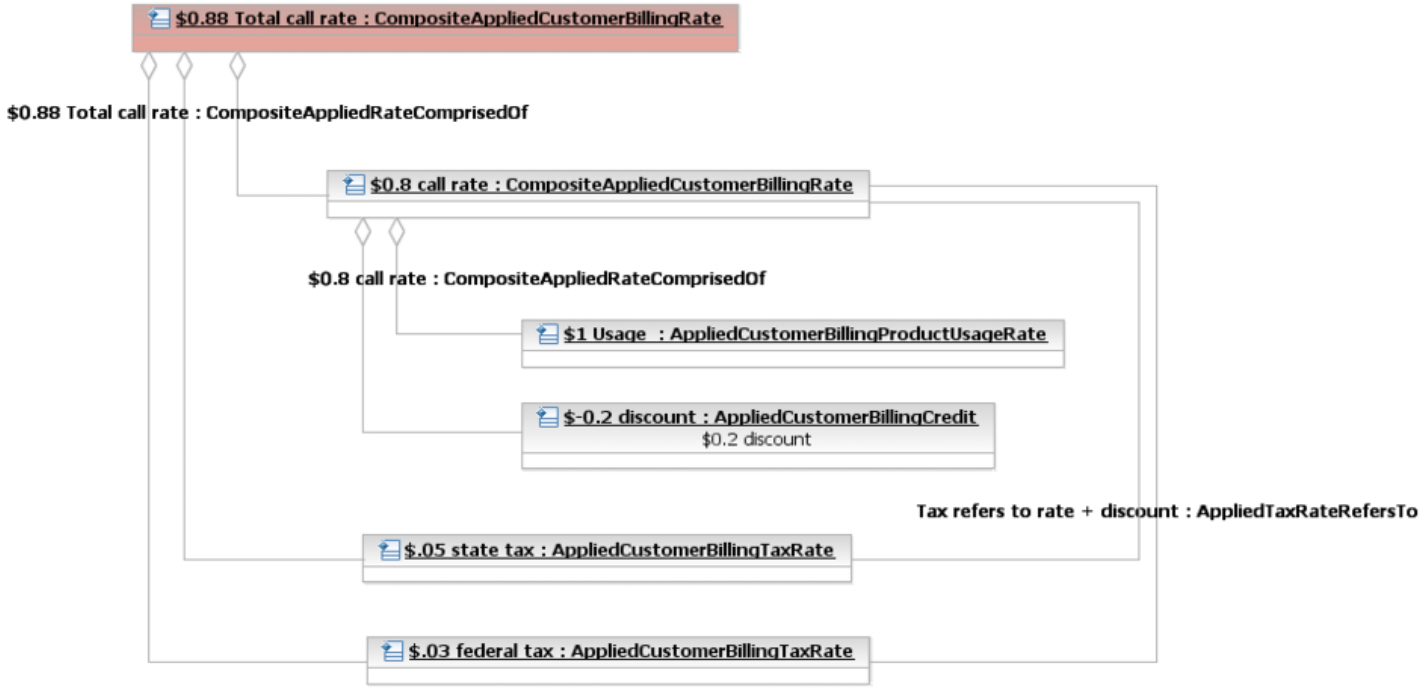


Figure C.12-01 – Issues with Using Composite/Atomic Charges to Model Financial Reporting

Figure C.12b - Applied Customer Billing Rate versus ProductPrice

At a high level An AppliedCustomerBillingRate is defined by a ProductPrice.

This Figure describes more detailed relationships between AppliedCustomerBillingProduct Charge and Alteration sub-classes and corresponding ProdPrice Charge and Alteration sub-classes.

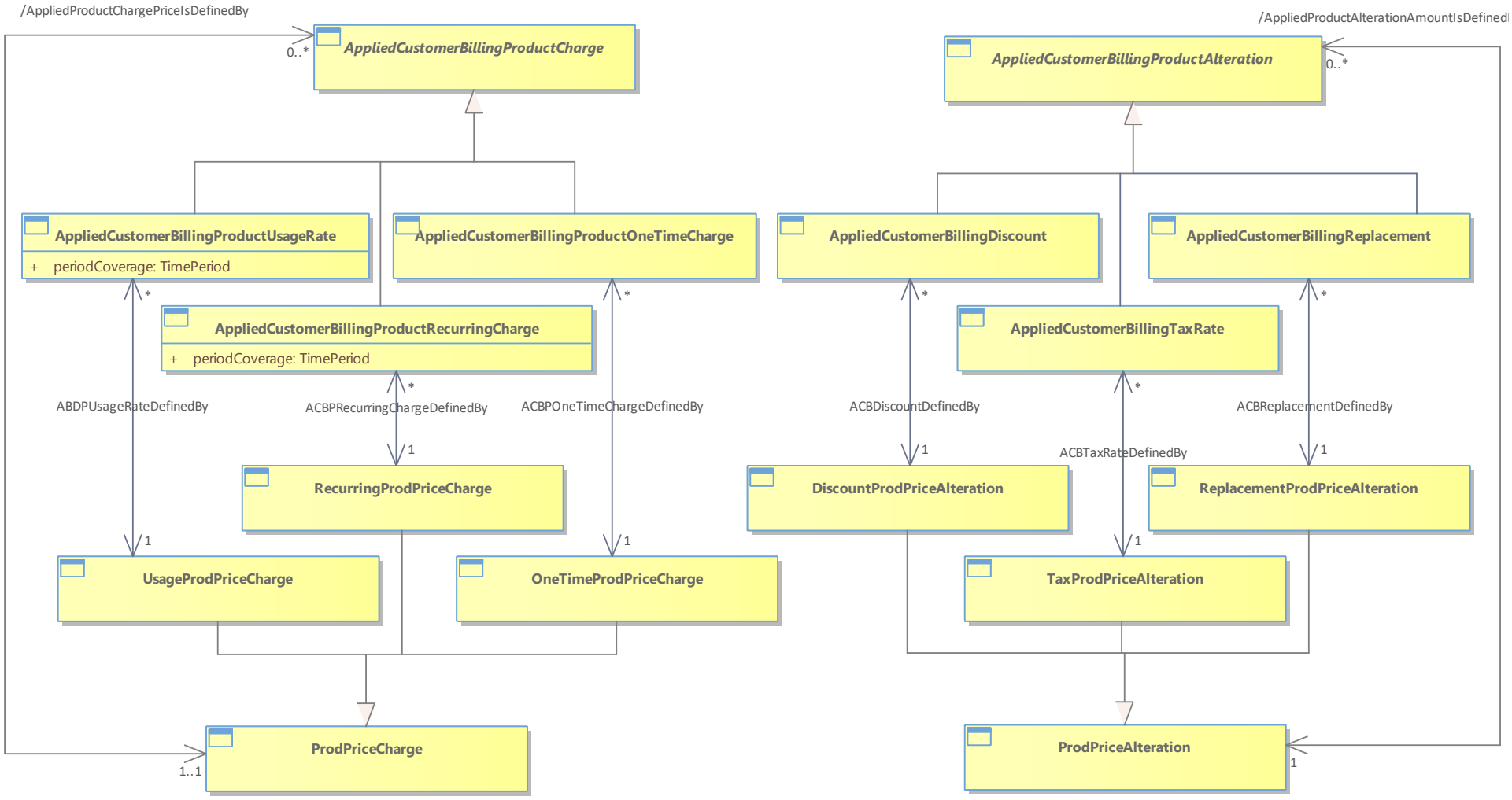


Figure C.12b - Applied Customer Billing Rate versus ProductPrice

4.3.1 Applied Customer Billing Rate Spec ABE

The Applied Customer Billing Rate Spec ABE is detailed description of AppliedCustomerBillingRate entity.

Figure ACBRS.01 - Applied Customer Billing Rate Spec ABE Related Elements

Following are the business entities aggregated under the Applied Customer Billing Rate Spec Aggregate Business Entity.

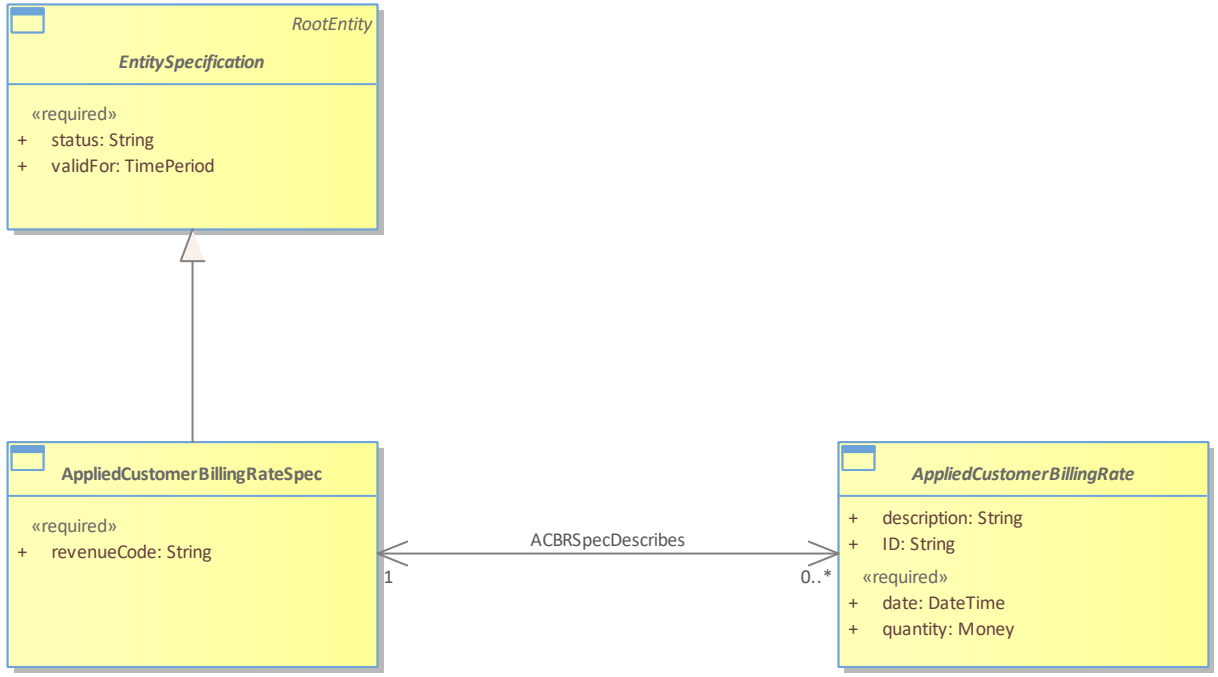


Figure ACBRS.01 - Applied Customer Billing Rate Spec ABE Related Elements

4.4 Customer Billing Account ABE

The **Customer Billing Account ABE** groups the classes concerned with the CustomerBillingAccount, i.e. the billing structure, billing cycles.

The Customer Billing Account receives all charges (recurring, one time charge and usage) of the ProductOfferingInstances and Products assigned to it.

It is used to manage account and its balance information. Balance represents an amount, with some monetary value, usually an aggregation, that indicates an aspect of financial liability between the service provider and the customer.

Figure Acc.01 - Account Overview (copy from common)

An Account specifies basic attributes and relationships that describe an account.

An Account aims to register all Credits and Debits according to criteria. It carries one or many Balances (results of Credits and Debits) and might use one or many Currencies.

Each Account is possessed by one or many PartyRoles such as the Holder or the Payer of a CustomerBillingAccount.

Each Account might be related to other Accounts such as a parent / child relationship.

BusinessPartnerAccount, CustomerBillingAccount and FinancialAccount are types of Account.

A BusinessPartnerAccount and CustomerBillingAccount carries additional information (such as creditLimit) and have specific relationships.

A FinancialAccount is part of the sub-ledger accounting that aggregates the amounts of one or more business partner and / or Customer accounts owned by a given party. It’s an internal view of the CSP to manage incomes and outcomes.

Each accounting event from a BusinessPartnerAccount or CustomerBillingAccount is logged to a FinancialAccount according to the assignment rules specified by BsuinessPartnerAccountAssignment and CustomerBillingAccountAssignment.

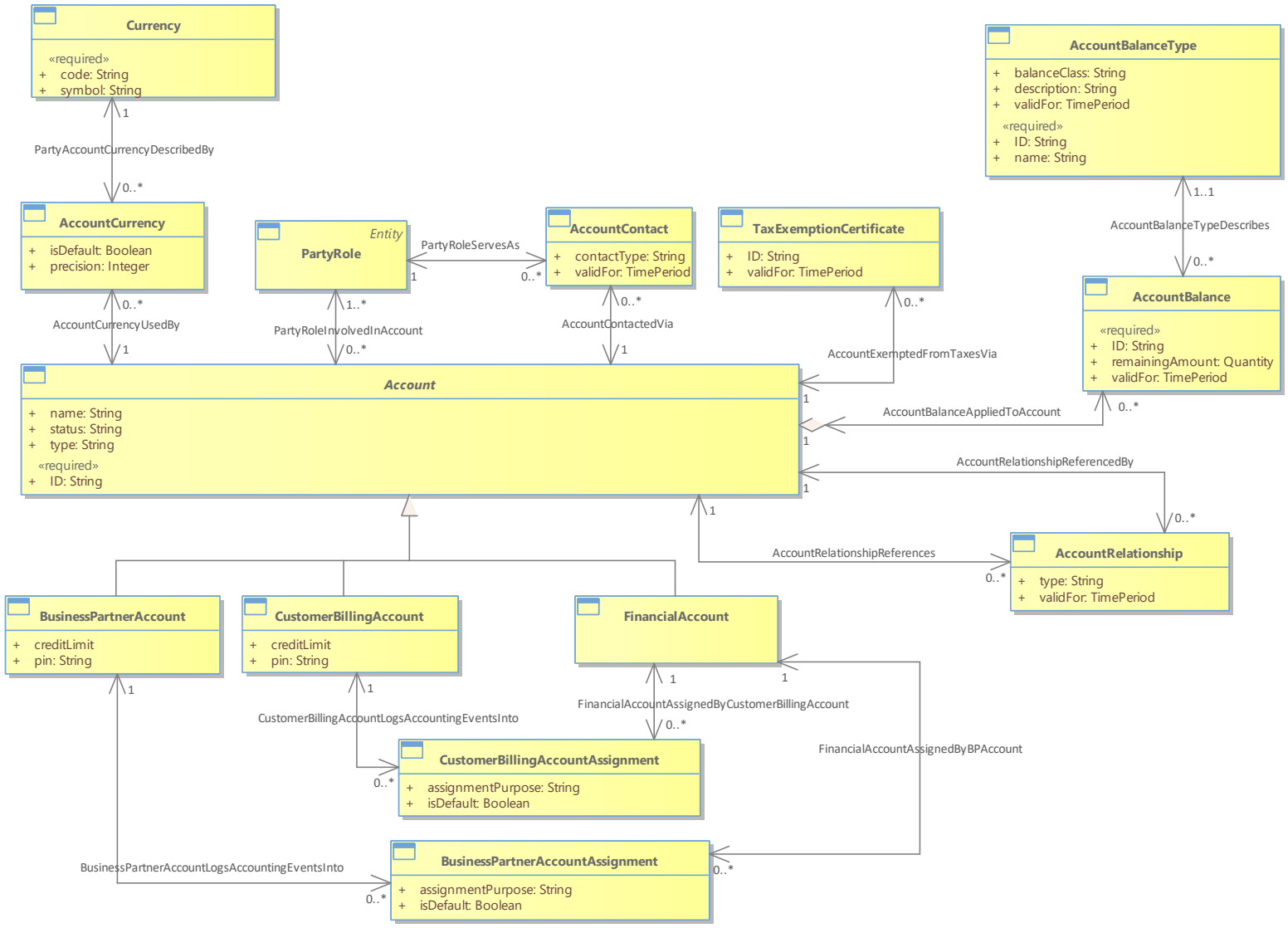


Figure Acc.01 - Account Overview (copy from common)

Figure C.24 - Customer Billing Account Balance overview

Balance (or balances) represents an amount, usually with some monetary value, usually an aggregation, that indicates an aspect of liability (often financial) between the service provider and the account holder (usually a customer). This amount can be monetary amount, or non-monetary (such as free minutes, or amount of loyalty points), can represent credit that the CSP holds for the customer (for example pre-paid balance) or debt that the customer owes the CSP (as is the normal case for post-paid A/R balance). Balance can be limited by regulation (for example, in most countries pre-paid balance cannot be negative by regulation) or by business rules (credit limit on post-paid balance based on customer credit profile) and so on.

Balance, by nature, is a temporal field and in many cases it is important to capture not only the value of the balance at a specific point in time but also the change of the value with time. In many cases systems will need to be able to answer a query such as “what was the post-paid customer account balance for account XXX on date YYY”.

Billing account balance can be used as the source of payment and/or as the target of payment. In some cases payments are designated to a specific balance (for example in case of top-up of pre-paid balance) and in some cases the designation is automatic (for example when the customer pays a post-paid bill). All these cases are captured by one concept (customer account balance) with some differentiation.

From the above it is clear that each CustomerBillingAccount may contain more than one balance and therefore, according to SID guidelines CustomerBillingAccountBalance is modeled as an entity with 1-* association to CustomerBillingAccount.

Below is some explanation how monetary balances are associated with payments. While monetary balances are very important, we should remember that the generic case includes non-monetary balances as well which are more loosely related to payments.

Acting as customer account balance management, Billing Account Balance ABE is related tightly to customer payment and other ABEs especially in charging domain. It is intended to support a converged model applicable for both prepaid and postpaid cases.

The prepaid customer needs CustomerBillingAccountBalance in recharging for storage. The payment model also need to handle prepaid customers in cases where there is no bill and payment goes directly into CustomerBillingAccountBalance. Then CustomerBillingAccountBalance amount could be applied to AppliedCustomerBillingRate which might be related to certain product usage event. From above, the prepaid customer needs CustomerBillingAccountBalance both in recharging and payment.

Actually in case of overpayment or refund for prize, CustomerBillingAccountBalance is the temporary method for storage to postpaid customer. From the view of postpaid customer, a payment is typically applied to a bill or an invoice, and indirectly applied to product and product usage. CustomerBillingAccountBalance could also be involved in payment as a payment method/source to a bill or an invoice. So the postpaid customer also needs CustomerBillingAccountBalance both in refunding and payment.

As shown in the Figure C.19, CustomerBillingAccountBalance (working as AccountBalancePM) could be taken as a payment method/source for certain payment amount.

Customer can have multiple product charges, and CustomerBillingAccountBalance can be shared between them, and used to pay product charges for other customers.

A payment may be applied to several bills or AppliedCustomerBillingRates according to the priority defined by payment plan. Before the bill or AppliedCustomerBillingRate is calculated, we need to associate product charges to certain CustomerBillingAccount(s), by which product usage are paid because bill or AppliedCustomerBillingRate is in aggregation relationship with certain CustomerBillingAccount(s). One CustomerBillingAccount may contain many CustomerBillingAccountBalances which could be associated to and pay for different product charges. Besides designating product charges to certain CustomerBillingAccount(s), we need also designate product charges to certain CustomerBillingAccountBalance(s) directly or indirectly. These designation relationships help to aggregate AtomicAppliedCustomerBillingRate(s) for product usage as certain financial charge and this financial charge is further associated with certain CustomerBillingAccountBalance(s).

CustomerBillingCreditBalance is a subclass of BillingAccountBalance.

Broad scope for CustomerBillingAccountBalance is shown as Figure below.

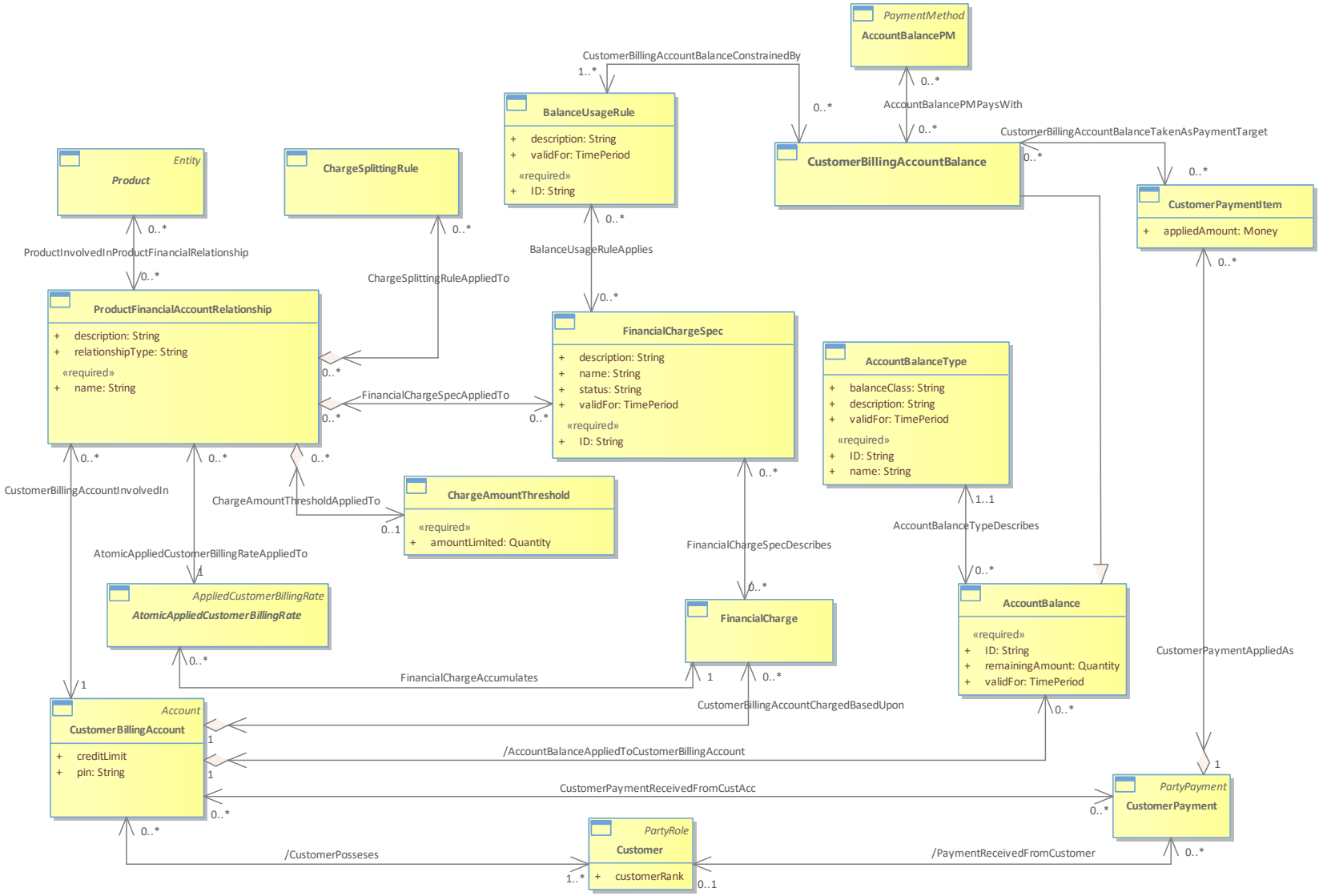


Figure C.24 - Customer Billing Account Balance overview

Figure C.25 - Customer Billing Account Balance, Part 1

Three key associated areas are product charge relationship area, core balance area and payment activity area.

Product charge relationship area contains relationships between product charge and CustomerBillingAccount and relationships between product charge and financial charge specification. Product charge relationship helps to relate product charge to certain CustomerBillingAccount(s) and carries out charging activities which result in possible financial charge.

Core balance area contains CustomerBillingAccountBalance management entity and relates certain CustomerBillingAccountBalance(s) with calculated amount waiting to be paid after charging process.

Payment activity area contains payment plan and carries out payment activities. Payment plan is associated with possible payment methods/sources and all kinds of payment target with different priority.

ProductFinancialAccountRelationship entity relates product charge to one or more CustomerBillingAccount(s) via which associated charging information is maintained. ProductFinancialAccountRelationship uses rule information(from ChargeSplittingRule and ChargeAmountThreshold) and charge information held by FinancialChargeSpec and AtomicAppliedCustomerBillingRate to decide the charge relationship, such as which charge from one product usage should be directed to which CustomerBillingAccount(s) and the charge amount. It is different from old FCAccumulatesAACBR where the CustomerBillingAccount which pays for the charge was already decided.

ChargeAmountThreshold constrains relationship between product charges and CustomerBillingAccount(s) by specifying a limited amount beyond which product charges will not be affordable by associated CustomerBillingAccount.

ChargeSplittingRule is charge-level/account-level rule information describing which product charge should be directed to which CustomerBillingAccounts. It can base on time and/or percentage. For example, if A gets a phone from the company and A pays 10% of the charges while the company pays 90% of the charges. For another example, the company pays all charges during the working time and the employee pays all charges out of the working time.

FinancialChargeSpec defines one specification for certain kind(s) of FinancialCharge. Instance of FinancialChargeSpec could be like long-distance call FinancialChargeSpec in contrast with local call FinancialChargeSpec. Based on FinancialChargeSpec, product charges could be directed to different CustomerBillingAccounts. For example, one enterprise customer only pays for the local call fee of its employees which means its employees need to pay long-distance call fee via their own CustomerBillingAccounts. Moreover, recorded in ProductFinancialAccountRelationship, Product or Product component is in align with certain FinancialChargeSpec which means charging fee for this Product or Product component will be aggregated as certain associated FinancialCharge under certain CustomerBillingAccount(s). One FinancialChargeSpec can be used in many different

ProductFinancialAccountRelationships instances. Reversely one ProductFinancialAccountRelationship can use several different FinancialChargeSpecs. For example, ProductInvolvementRole is a long-distance call user. Here FCS might be one long-distance call FinancialChargeSpec. Moreover, FinancialChargeSpec might also be several FinancialChargeSpecs (one might be local call FinancialChargeSpec, the other might be long-distance call FinancialChargeSpec). Here one or several FinancialChargeSpecs might be determined by how to design FCS and the government's regulation on how to charge on one product usage. One more example is that the charging policy is changed based on time (such as peak time charging policy and off-peak time charging policy) while the calling is going through the border between peak time and non-peak time. So the calling is associated with two FinancialChargeSpecs at last.

Product charge relationship area is as shown in the Figure below.

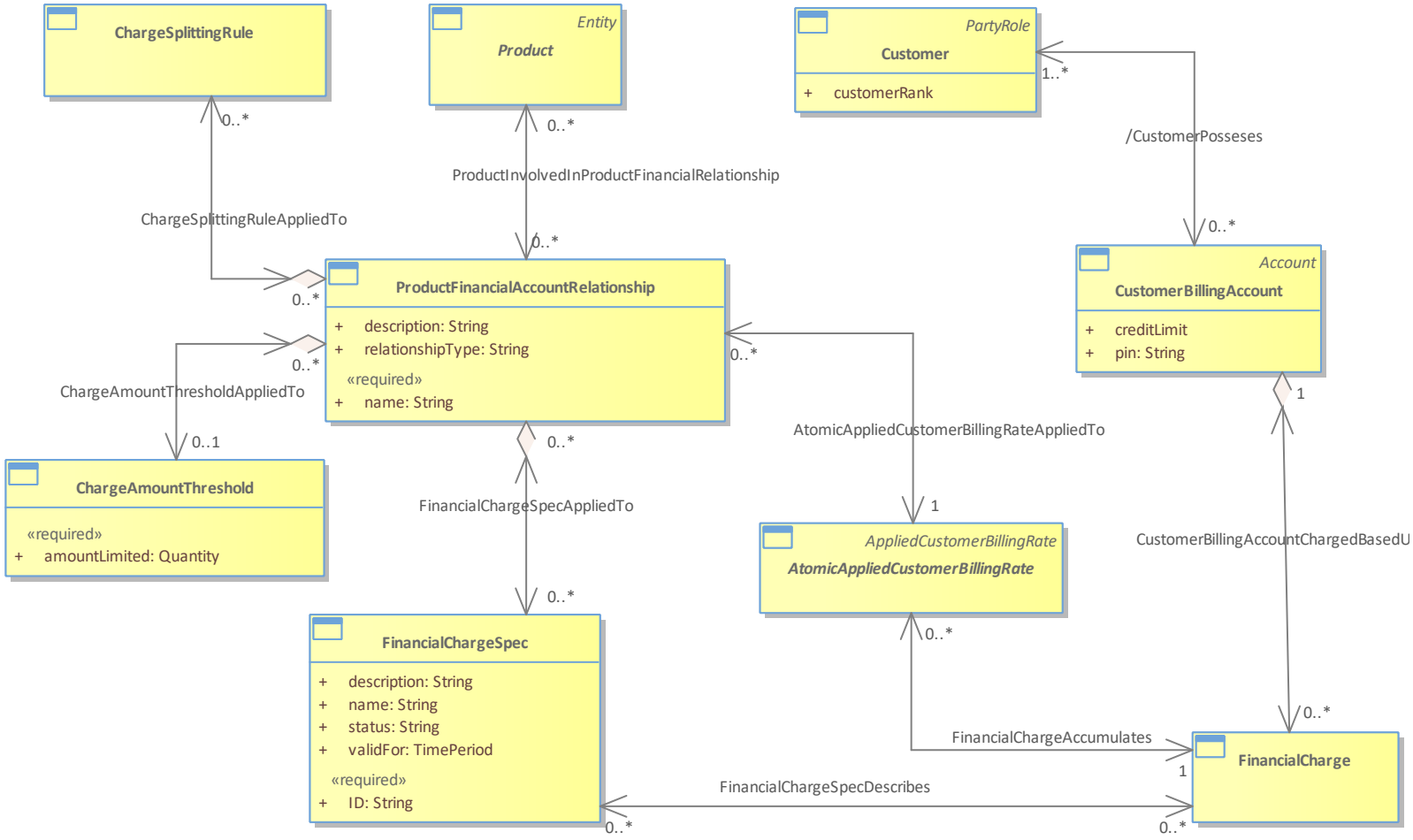


Figure C.25 - Customer Billing Account Balance, Part 1

Figure C.26 - Customer Billing Account Balance, Part 2

Core balance area is as shown in the Figure C.26 below.

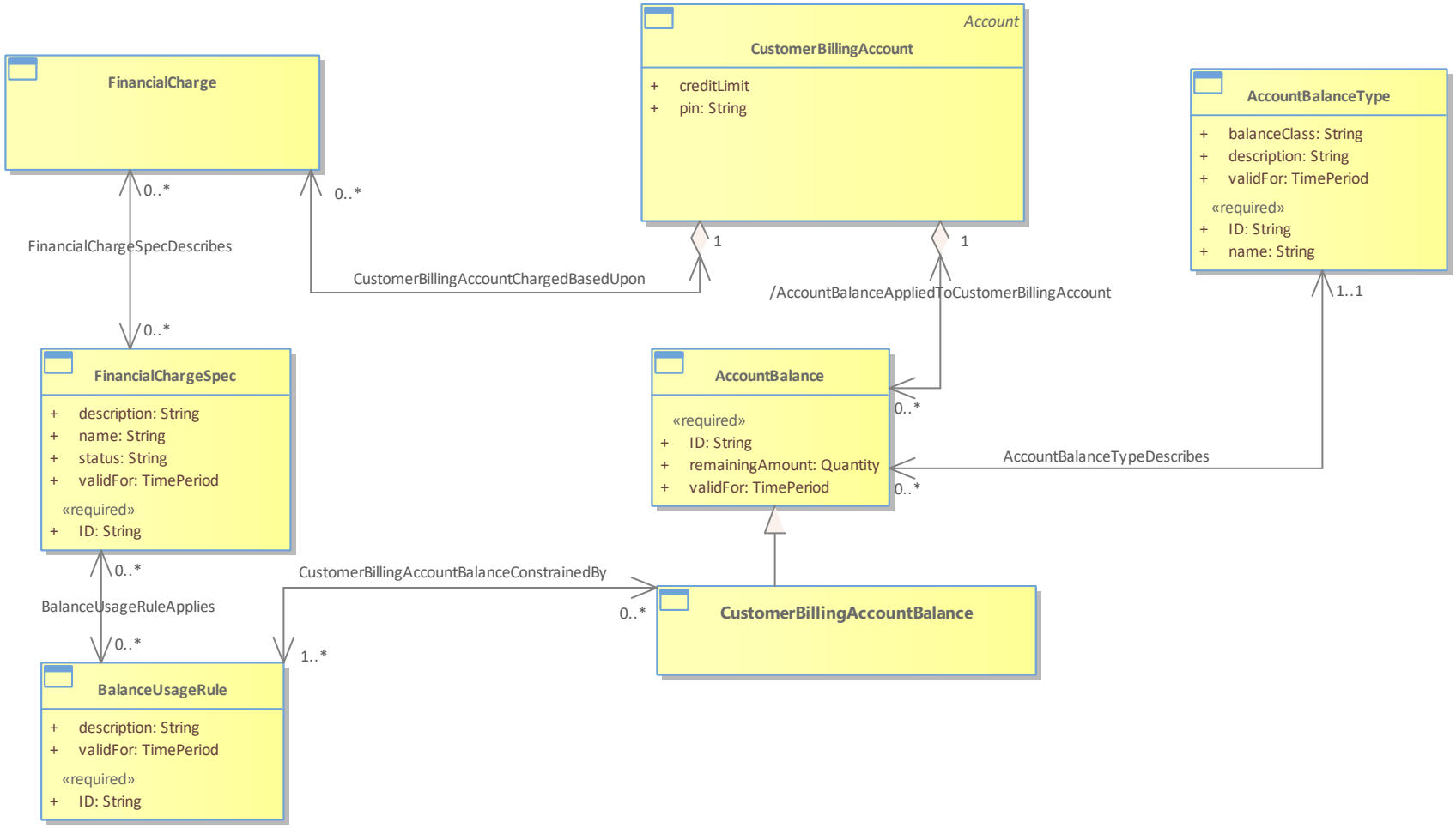


Figure C.26 - Customer Billing Account Balance, Part 2

Figure C.27 - Customer Billing Account Balance, Part 3

CustomerBillingAccountBalance represents and tracks the amount remained or owed in certain CustomerBillingAccount. The attribute remainedAmount is Quantity type. Here Quantity type represents both non-monetary balance and monetary balance. Non-monetary balance is applied to the service usage volume and monetary balance is applied to the monetary amount.

BalanceUsageRule is balance-level rule information constraining the application of CustomerBillingAccountBalance. It could describe the sharing rule, by which CustomerBillingAccountBalance could be shared between different kinds of FinancialCharge which is related to different customer's product charge. It could emphasize associated CustomerBillingAccountBalance is only applicable for certain usage, for example only applicable for local phone call or domestic flow or intra-PLMN SMS. FinancialChargeSpec could be applied to BalanceUsageRule to help to describe specification of FinancialCharge and relate them to the sharing information and the private usage information. BalanceUsageRule also includes priority and other kinds of rules limits the application of CustomerBillingAccountBalance. For example, the refund SMS account balance should be used before monetary account balance when SMS is used.

The payment model presented here is intended to support a converged payment model for both prepaid and postpaid condition. PaymentPlan could trigger CustomerPayment activities after Bill/AppliedCustomerBillingRate is calculated out. AccountBalancePM defines possible payment method using CustomerBillingAccountBalance as payment source. When CustomerBillingAccountBalance is the payment source, BalanceUsageRule constraints carrying out of payment activities.

Payment activity area is as shown in the Figure C.27 below.

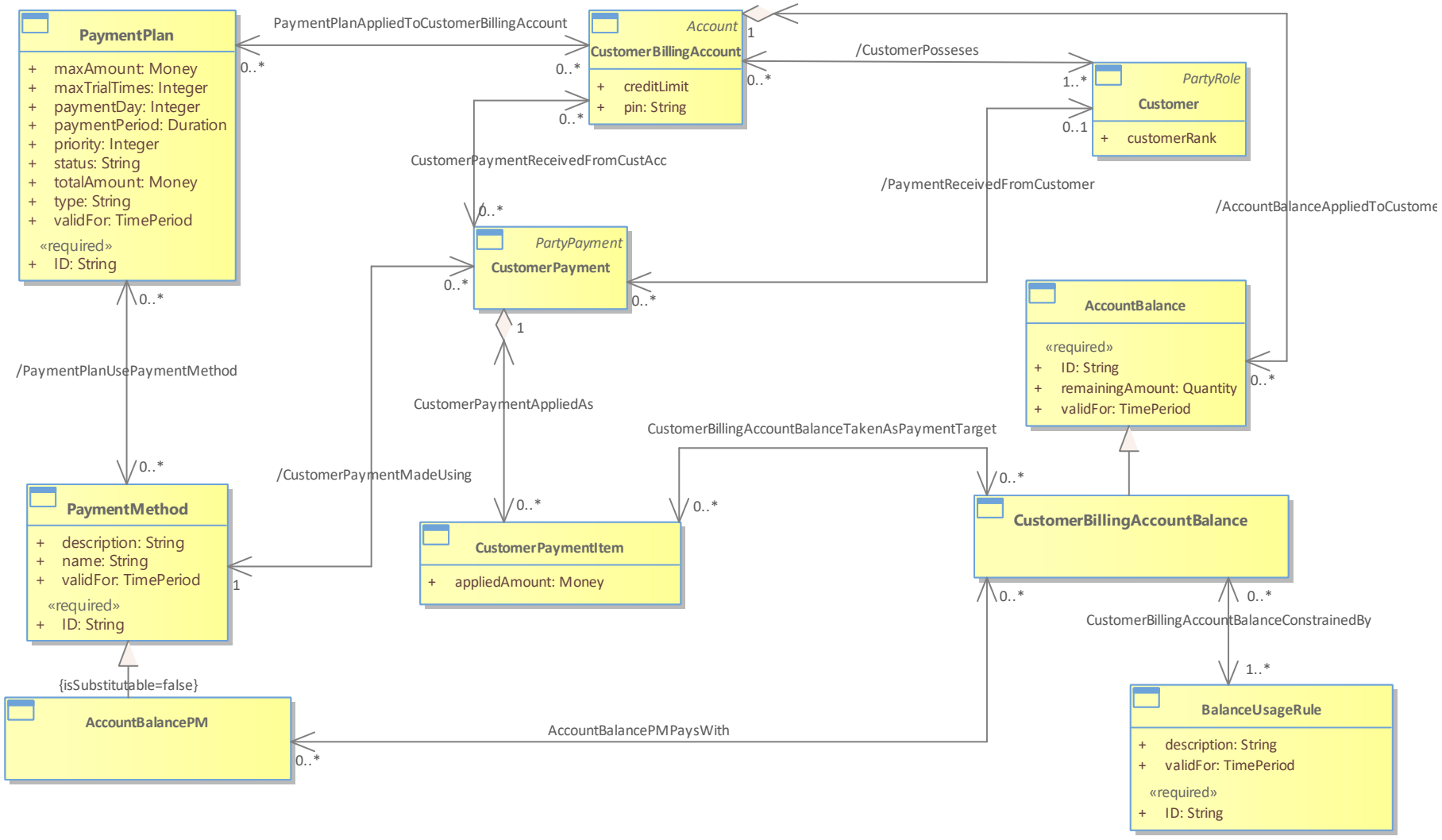


Figure C.27 - Customer Billing Account Balance, Part 3

4.5 Customer Bill ABE

The **Customer Bill ABE** represents the specification of different formats of CustomerBill, the schedule of the production of bills and the Customer Bills themselves.

Figure C.11 - Billing Entities Overview

A typical billing process involves collecting business transaction details from network equipment, application servers and various other sources, correlating and formatting collected transaction details into billable events that a billing system can understand, guiding (associating usage to customer products), assigning charges to each billable event, applying other fees and discounts, applying taxes, and aggregating everything into customer bills (invoices) and receiving and recording payments from customers.

This model is not focused on any specific business domain but rather tries to build a model framework into which models for different billing domains would fit (for example, telecom billing, utilities billing). It also supports all three basic billing types: postpaid periodical billing, postpaid real-time billing and prepaid real-time billing. The model, by no means, represents the complete set of bill elements that can be incurred. The model provides a framework into which other types of bill elements can easily fit.

The overview figure below shows a simplified overview of the main billing domain business entities. The text following the figure provides an explanation of each of the figure's entities.

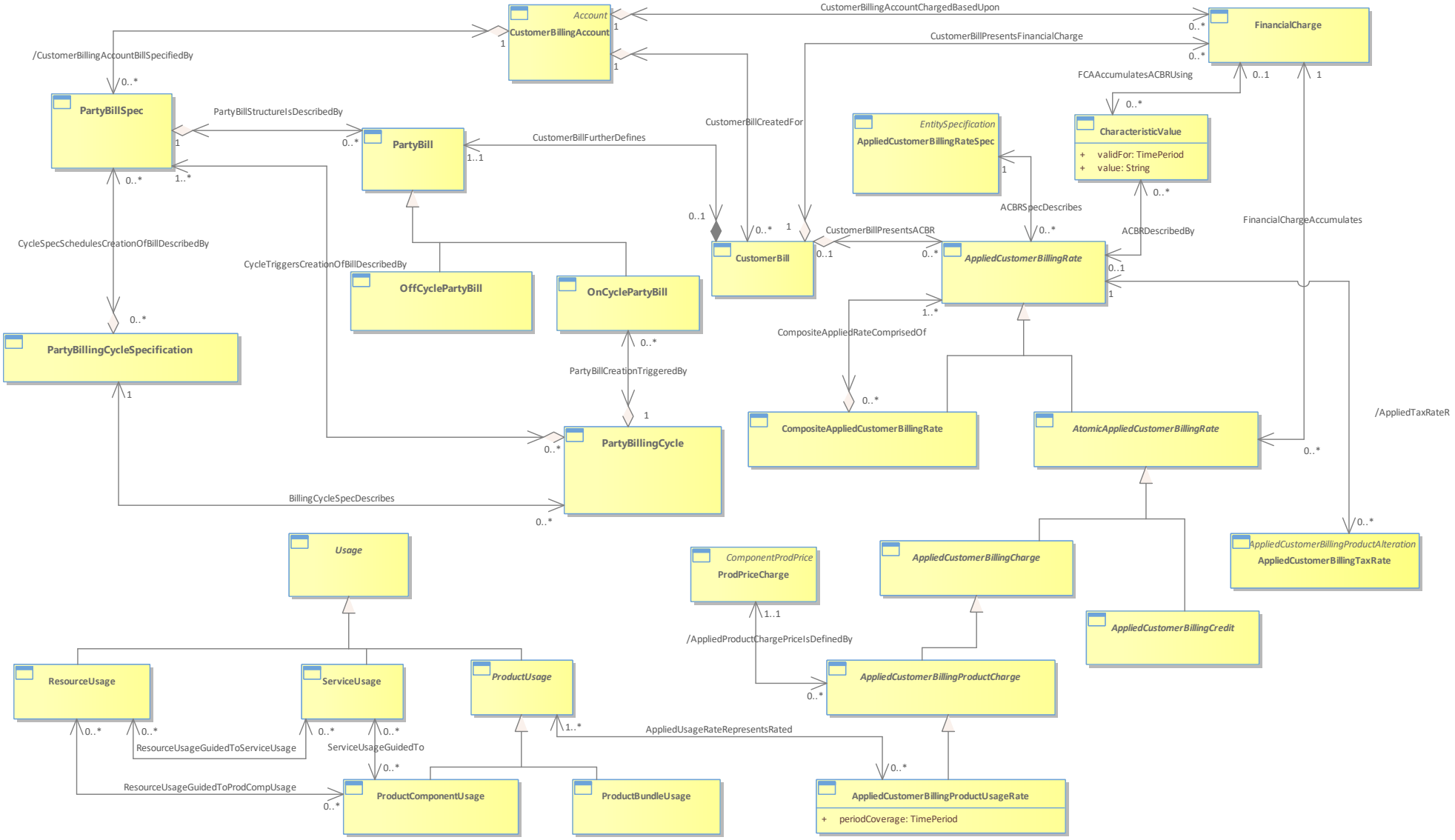


Figure C.11 - Billing Entities Overview

Figure C.13 - Customer Bill

The PartyBillllingSpecification describes the detailed structure of the customer's bill. It describes which AppliedCustomerBillingRates should be included into the bill, when to initiate the bill creation and bill presentation formats. The presentation format of the bill and its aggregated AppliedCustomerBillingRates are described by the PartyBillFormat. The bill may be presented via various presentation media (for example, email, post mail, web page).

The PartyBillingCycleSpecification, as shown in the figure above, identifies when to initiate a billing cycle and various sub steps of a billing cycle. It defines a date to be shown on the bill, the date through which charges and credits previously received by the billing system will appear on the bill, the mailing date and the payment due date.

The PartyBillingCycle entity represents a particular occurrence of a billing cycle. Besides significant dates, it records who (or what) triggered the cycle. The PartyBillingCycle aggregates all PartyBillSpecs and in this way defines which bills are to be created during the represented billing cycle.

CustomerBills can be created as a result of a cycle run or as a result of other events such as customer request or account close. The bills which are created as a result of a cycle run are described by the entity OnCyclePartyBill (which is a subclass of CustomerBill) which includes a mandatory association to the PartyBillingCycle that triggered the cycle run. Bills which are generated as a result of a different event are represented by the entity OffCyclePartyBill.

The CustomerBill entity is used to model a bill (an invoice). It represents a total amount due for all products during the billing period and all significant dates (i.e. billDate, chargeDate, creditDate, mailingDate and paymentDueDate). The structure of the bill and its presentation formats are described by the PartyBillSpec. OnCyclePartyBill is generated during the PartyBillingCycle and is associated with a customer account. The CustomerBill aggregates FinancialCharges and displays AppliedCustomerBillingRates.

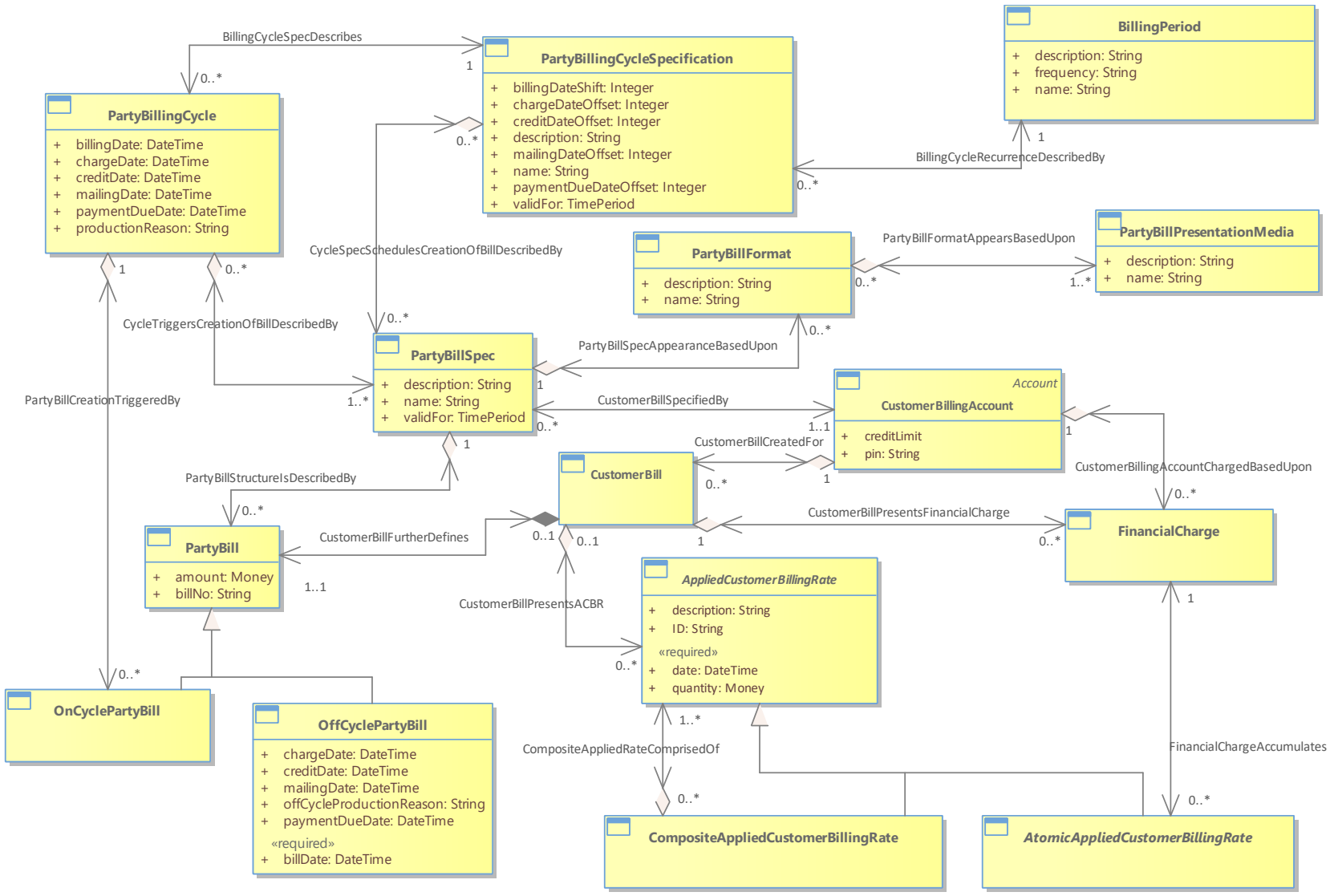


Figure C.13 - Customer Bill

Figure C.14 - FinancialCharge accumulates AtomicAppliedCustomerBillingRate

Let's imagine the AtomicAppliedCustomerBillingRate and CompositeAppliedCustomerBillingRate, the latter containing the former. While both applied rates may be included into the bill, only one of both may be summarized into the bill amount. The typical reason to include CompositeAppliedCustomerBillingRate into the bill is to present a partial sum, either for customer information or because some other applied rates refer to it. FinancialCharge, on the other hand, is the entity that accumulates AtomicAppliedCustomerBillingRate into the bill amount, and therefore the entity which influences the customer account's balance. The accumulation is based on characteristic values of AppliedCustomerBillingRate as described in the figure below.

In this figure, we see that the CustomerBill presents both AppliedCustomerBillingRates and FinancialCharges – this depends on the business requirements, configuration and regulations – one or both options are possible pending the CSP business.

The important thing (and change from Information Framework versions prior to version 12) is that the CustomerBillingAccount now is based upon the FinancialCharges and not upon the AppliedCustomerBillingRate, for reasons which are explained above. FinancialCharge can accumulate AppliedCustomerBillingRates based on its characteristic values, so that it can accumulate based on ACBR type, line of business, service type or any other ACBR characteristic.

The presented model by no means represents the complete set of bill elements that can be incurred. The model provides a framework into which other types of bill elements can easily fit.

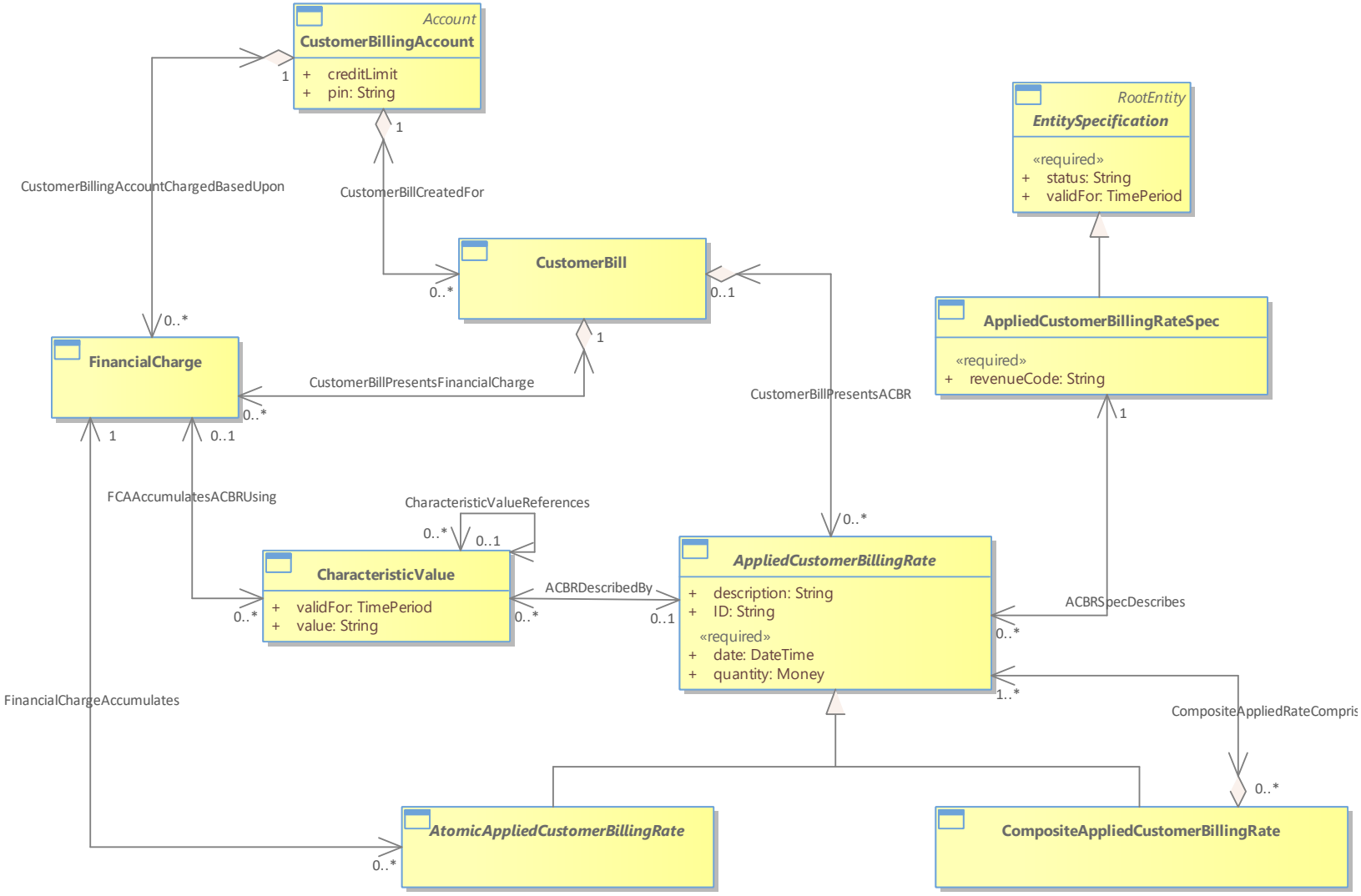


Figure C.14 - FinancialCharge accumulates AtomicAppliedCustomerBillingRate

4.5.1 Customer Billing Statistic ABE

The Customer Billing Statistic ABE represents collected data derived from CustomerBills.

Figure CBS.01 - Customer Billing Statistic ABE Related Entities

Following are the business entities aggregated under the Customer Billing Statistic Aggregate Business Entity.

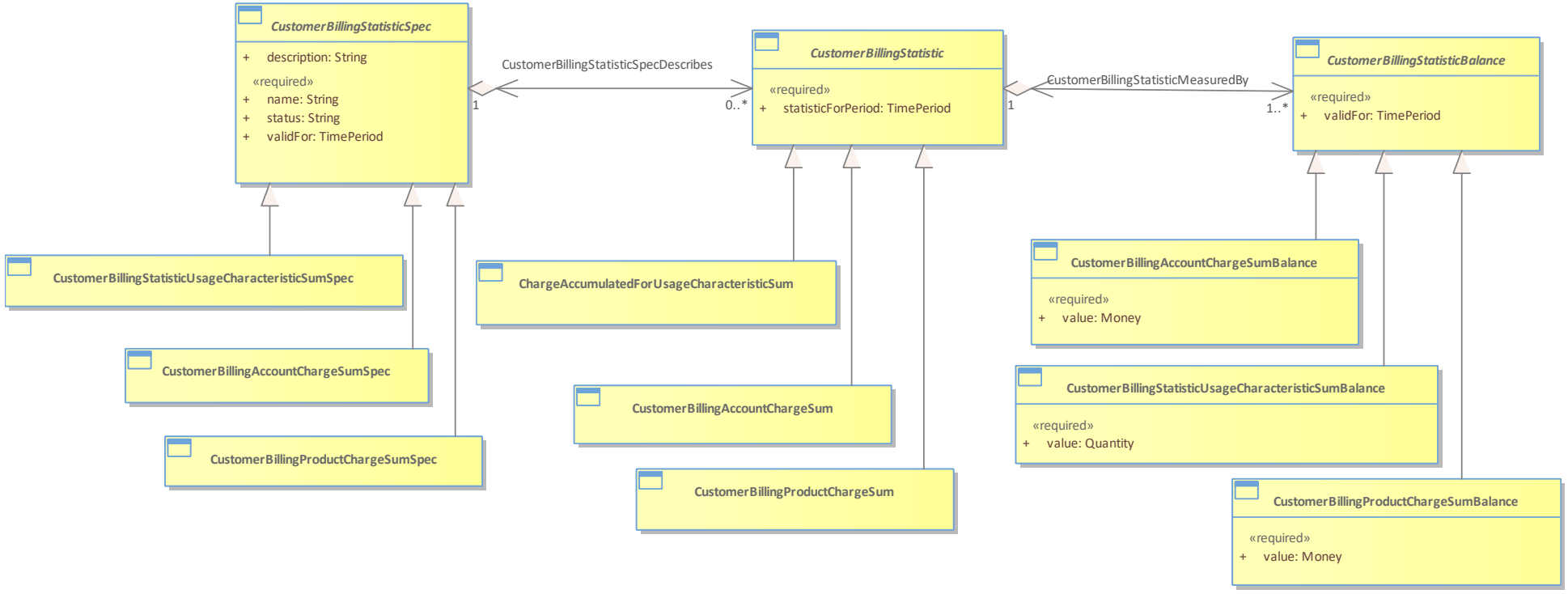


Figure CBS.01 - Customer Billing Statistic ABE Related Entities

4.6 Customer Bill Collection ABE

The **Customer Bill Collection ABE** handles Customer payments to the CSP and actions for overdue debts.

Figure C.17 - Customer Payment Scope

This section is intended to define the scope of customer payment from the following perspectives. For more information about Payment refers to Party Payment in the Common Guide book.

Why (the reason for payment)

- From the view of customer, a payment is usually applied to a bill or an invoice, maybe through a customer account, and applied to product and product usage in both prepaid and postpaid scenarios. The payment may represent a prepayment. The payment amount may be a credit or debit amount. The payment is eventually applied to a bill or FinancialCharge/AppliedCustomerBillingRate.

How (the methods and plan for payment)

- Payment is implemented through different means, such as cash, check, bank card, third party, account balance and loyalty burn, and so forth. A payment is applied to several bills or FinancialCharge/AppliedCustomerBillingRate according to the priority defined by payment plan.

When

- In case of auto pay or receipt of customer payment

Who

- Payee and Payer, the third party as an agency

What (customer payment scope)

- Involve all the above info, which is described in Figure C.17 – Customer Payment Scope below.

The payment model presented here is intended to support a converged payment model for both prepaid and postpaid conditions. Other requirements include:

- Handling prepaid customers in cases where there is no bill. So, Payment could be related to FinanicalCharge/AppliedCustomerBillingRate and not to a CustomerBill.
- Handling a payment that is applied to multiple bills
- Handling underpayments and overpayments.

When a CustomerBillingAccount uses a PaymentMethod by default, it means that for each CustomerBill produced a CustomerPayment will be triggered using this PaymentMethod.

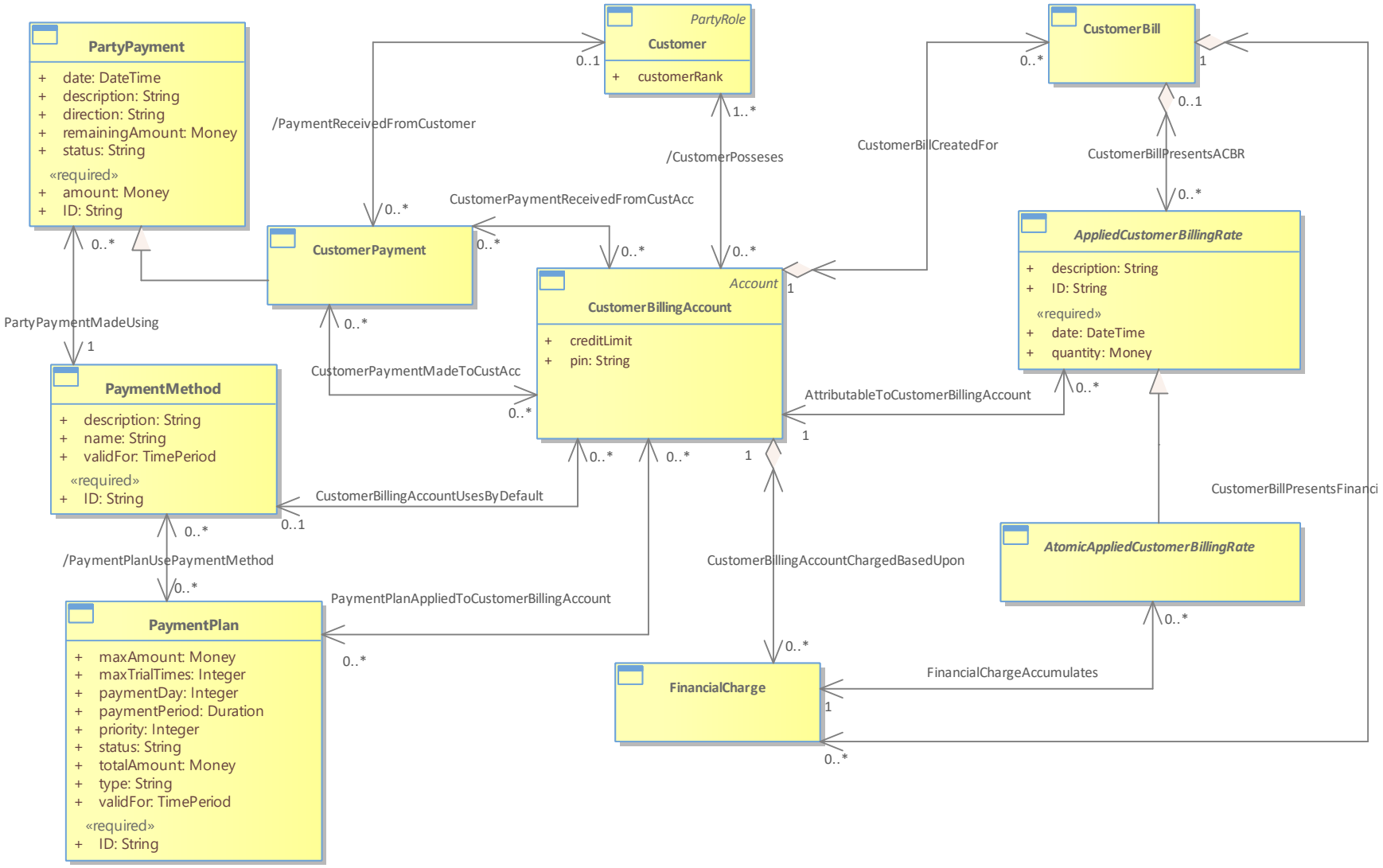


Figure C.17 - Customer Payment Scope

Figure C.18 - Payment's Associations with Roles

Customer and ThirdPartyAgency play a role as payee. Payment is received for one or more CustomerBillingAccounts.

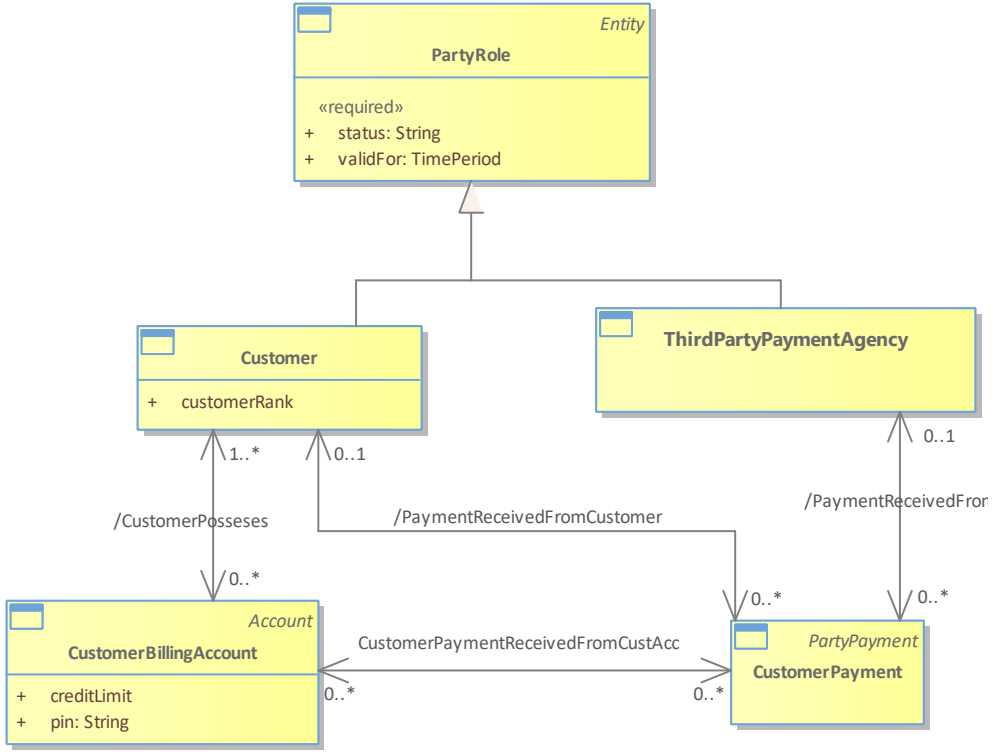


Figure C.18 - Payment's Associations with Roles

Figure C.19 - Payment Method and Plan

The means of payment is classified by PaymentMethod.

For example, payment by cash, check, bank card (credit card or debit card), third party (like bank transfer, payment tool), account balance and loyalty burn.

PaymentMethod has a generalization of the subclasses shown in Figure C.19 – Payment Method and Plan, which could be used by PaymentPlan.

In case of auto payment, PaymentPlan will use PaymentMethod and the information from CustomerBillingAccount to obtain the money and then apply them based on prearrangement, such as priority of bills based on payment due date.

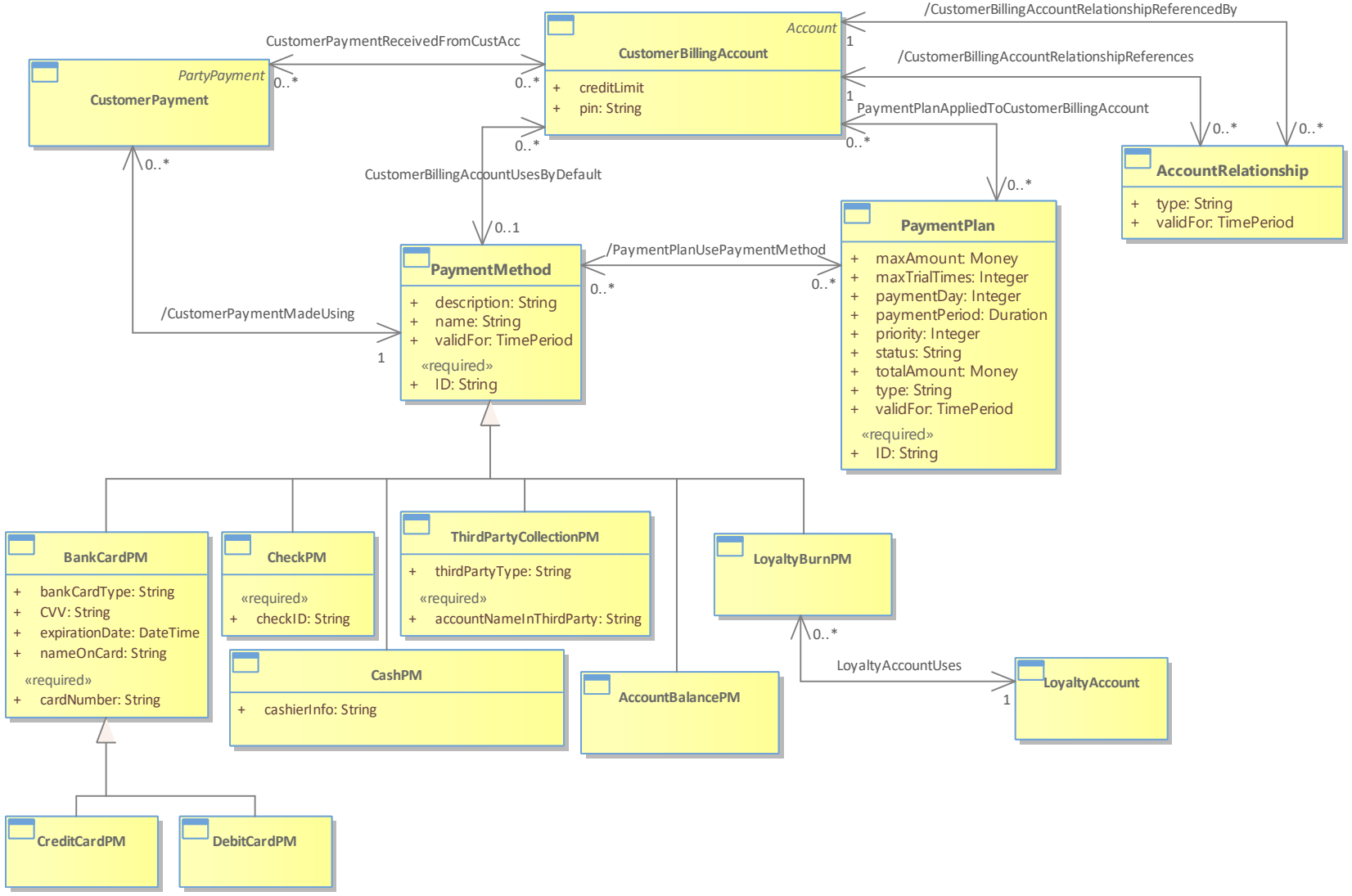


Figure C.19 - Payment Method and Plan

Figure C.20 - Payment Method and Bank

The relationship between PaymentMethod and Bank related entities is shown in Figure C.20 – Payment Method and Bank. Here the related subclasses of PaymentMethod are CheckPM and BankCardPM which has two subclasses of CreditCardPM and DebitCardPM.

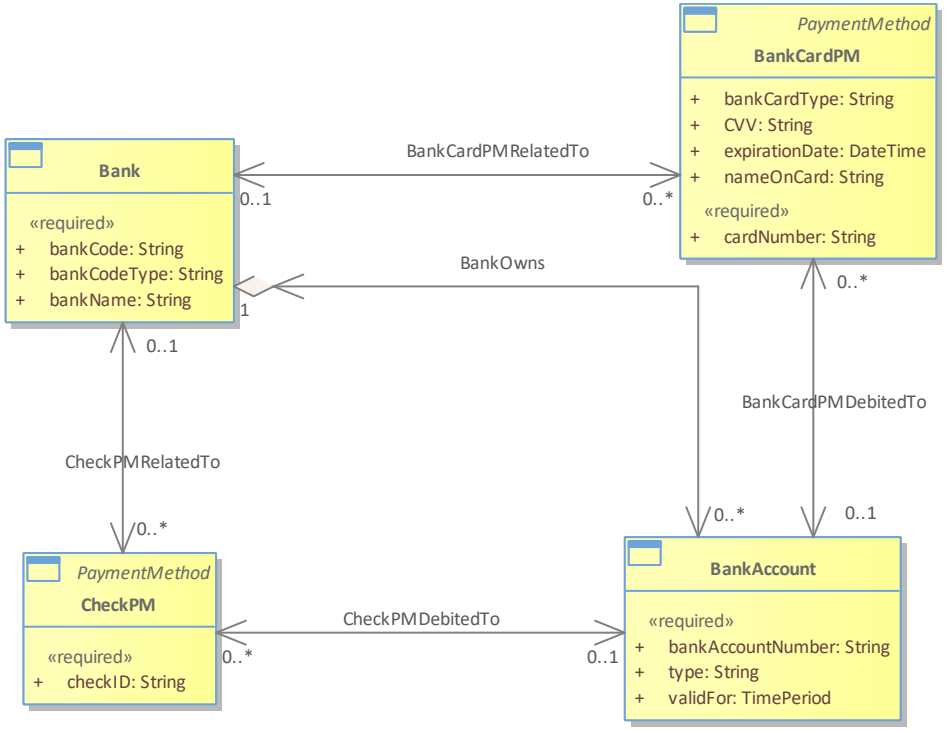


Figure C.20 - Payment Method and Bank

Figure C.21 - Applying Payment

As shown in Figure C.21 – Applying Payment, Payments can be applied to the CustomerBill and FinancialCharge/AppliedCustomerBillingRate.

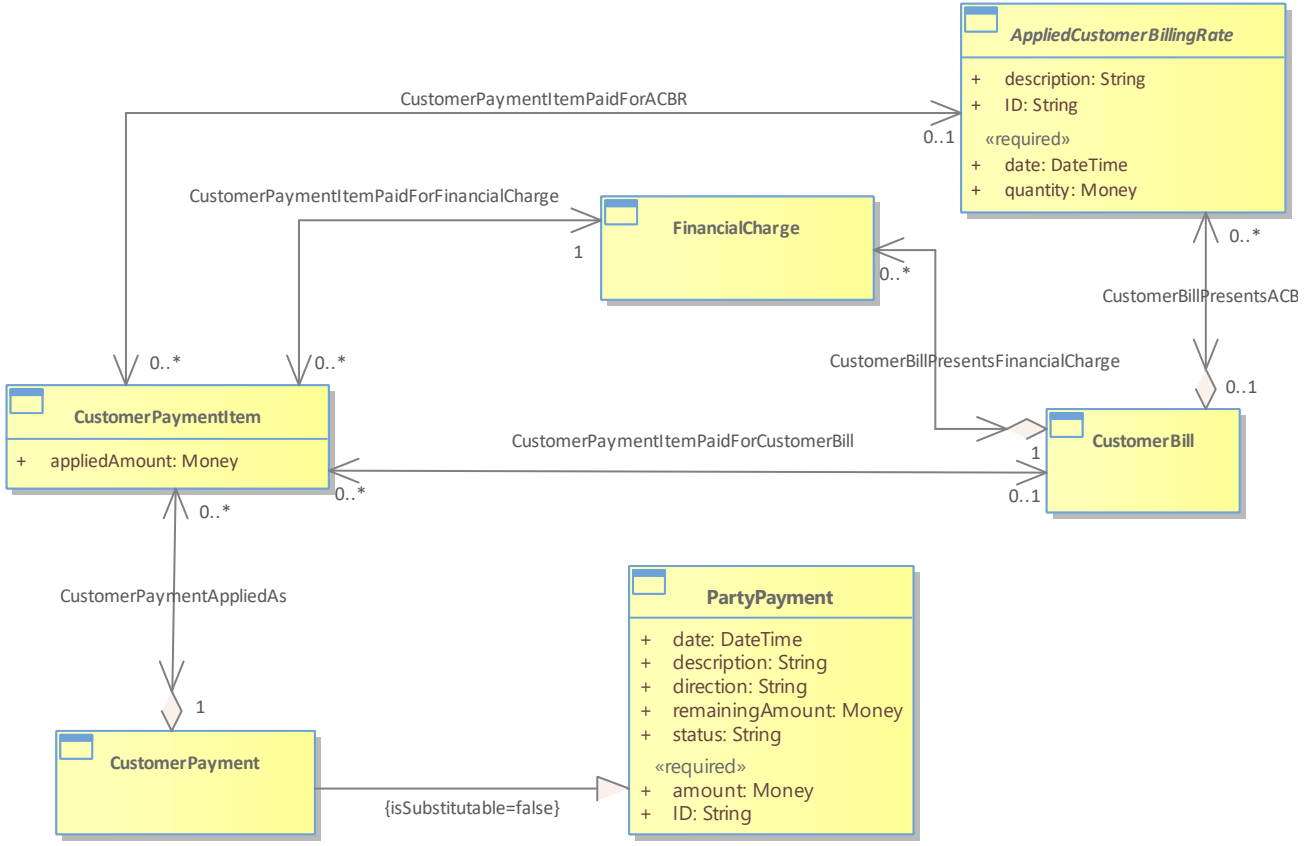


Figure C.21 - Applying Payment

Figure C.22 - Dunning Scenario and Case

The Dunning ABE is part of the Customer Bill Collection ABE.

This section is intended to define the scope of information used by the dunning process.

More precisely, this section describes information produced and consumed by the level 3 business processes from eTOM

- 1.1.1.11.3 Manage Customer Debt Collection
- and 1.1.1.1.14 Support Bill Payments & Receivable Management

The following Figure C.22 – Dunning Scenario and Case presents the dunning scenario and the corresponding cases.

Each provider/operator has to define its dunning strategy. This strategy is described by DunningScenario. Each DunningScenario contains the dunning rules to apply to a case, the order in which applying them, the events that trigger dunning rules evaluation, the actions that must be done, and so forth.

The DunningCaseRules are specified by DunningRule that is a type of PolicyRule.

This allows specifying for each dunning rule:

- the events that trigger the evaluation of the rule (Ex: due debt not paid after 8 days
- conditions that have to be evaluated (Ex: no bill dispute in progress)
- and actions that must be done (Ex: send a dunning letter).

A DunningScenario is assigned to a CustomerBillingAccount, depending on the Holder quality (Ex: a more tolerant DunningScenario is assigned to VIPs).

If no specific DunningScenario is assigned to a CustomerBillingAccount, a default scenario is applied.

As soon as an event triggering a DunningRule occurs on a CustomerBillingAccount, a DunningCase is created according to the DunningScenario assigned to the CustomerBillingAccount.

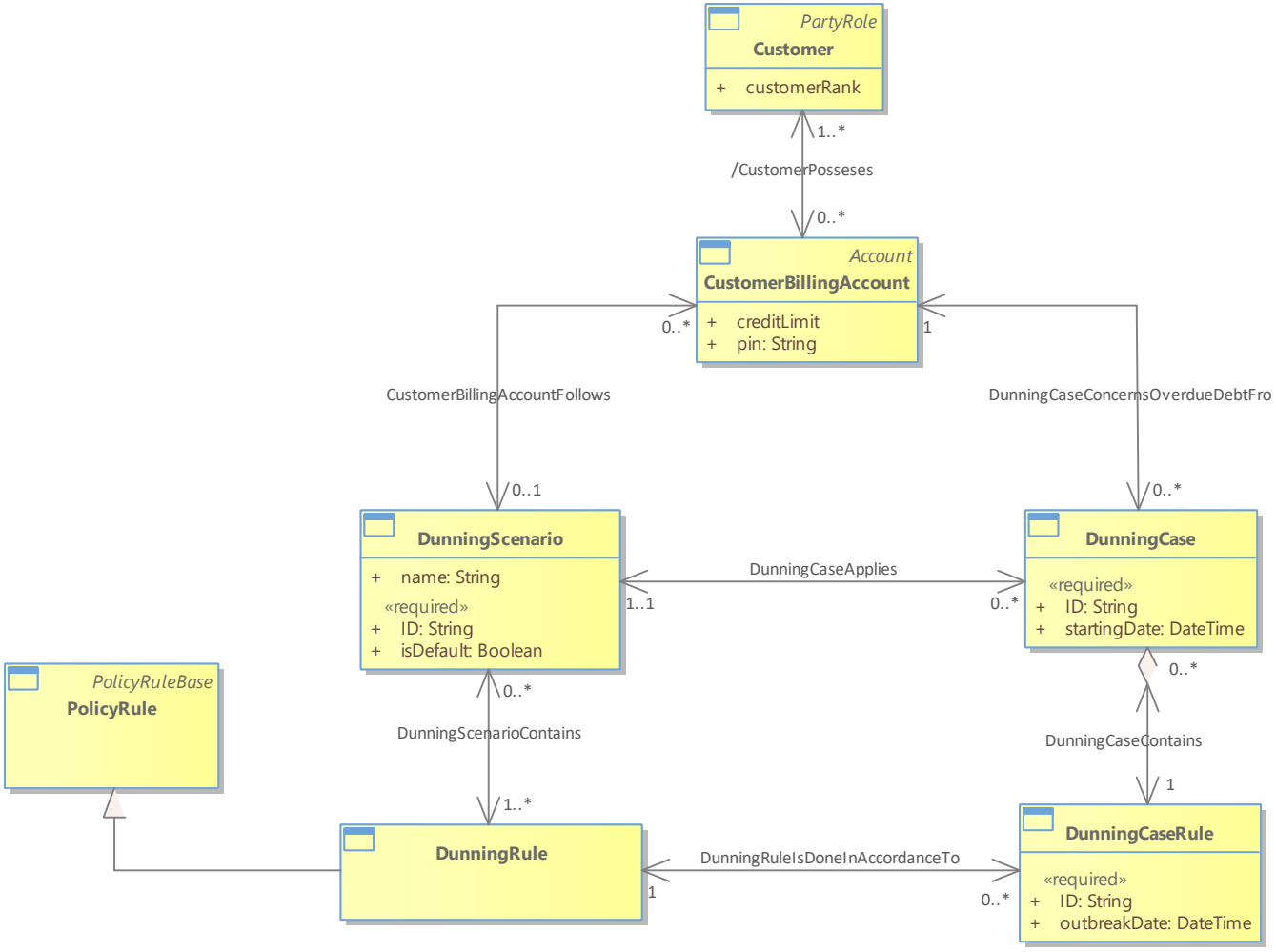


Figure C.22 - Dunning Scenario and Case

Figure C.22-01 – Dunning Scenario Illustration

The following example illustrates the use of the dunning model and, more specifically, the inheritance from PolicyRule.

In this example, the provider/operator has defined a default Dunning scenario for Mass Market.

The Rules 1 and 1b use the same PolicyEvent and the same PolicyAction but their conditions are different. Only one of these two rules may be applied in a specific context.

In the Rules 2 and 2b

- the PolicyEvents and the PolicyAction are the same
- but the PolicyConditions are different: the amount of the due debt conditioning the action is only 20€ for a bad debtor and 100€ for a good payer.

The Rules 13 and 13b trigger two PolicyActions if the condition is true.

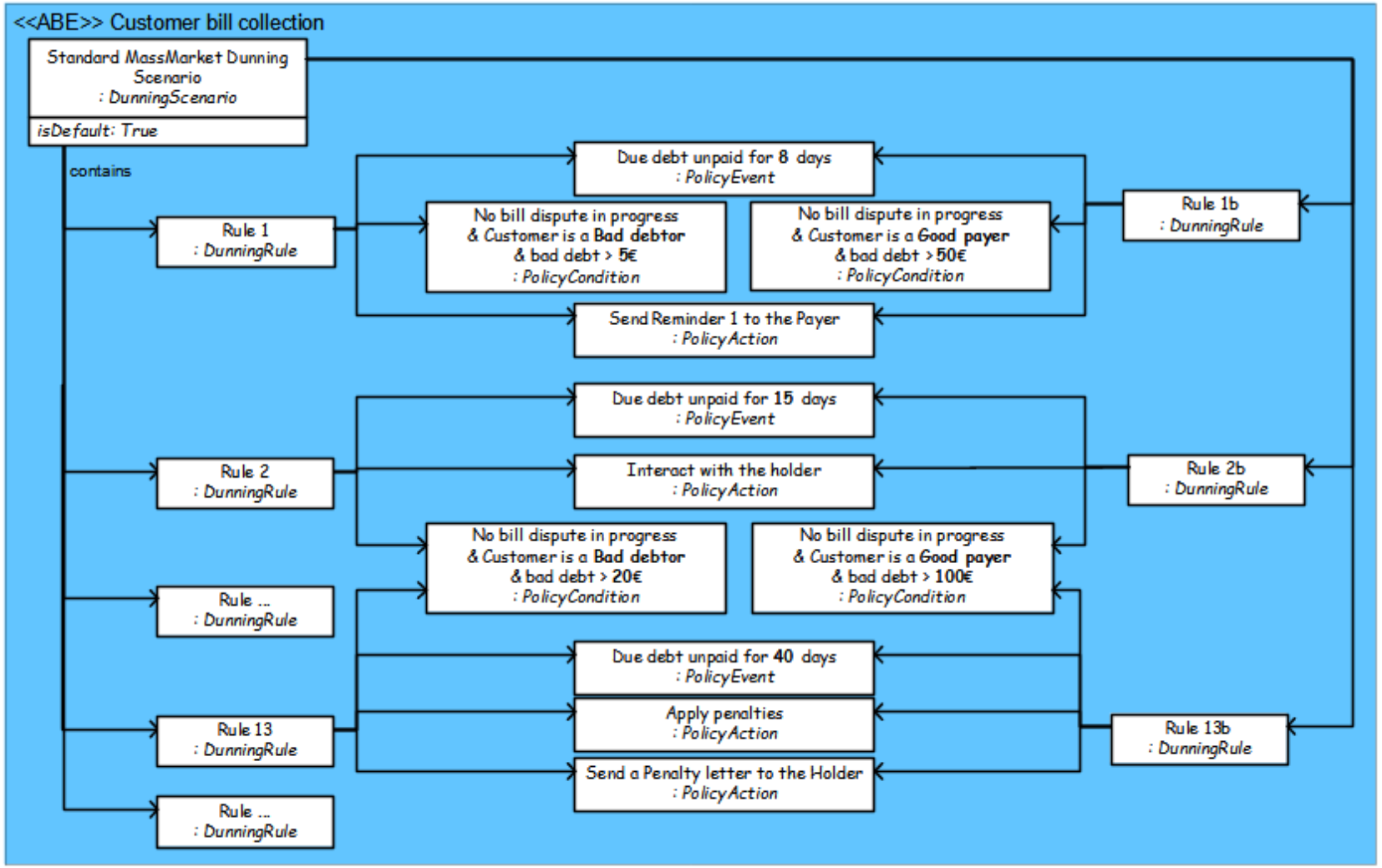


Figure C.22-01 – Dunning Scenario Illustration

Figure C.23 - Dunning Result

The diagram below presents the different type of actions resulting from a dunning process.

When a dunning process is triggered, it will first create a SoftDunning. At this stage the provider/operator starts to get in touch with the payer. And without result, we get in touch with the holder.

Finally, after restriction measures, the entire holder's contracts are removed and a closing invoice is produced.

Once the closing invoice is produced, a HardDunning starts.

According to the law, several interactions will be done with the holder and finally a DunningWriteOff is credited.

Each time DunningRule events occur, a DunningCaseRule is triggered to apply it.

If the condition specified by the DunningRule is true, then one or several actions are done.

The different types of dunning actions are the following:

- One type of dunning action may be to interact with the customer to ask for a CustomerPayment or negotiate a PaymentPlan;
- Another type of dunning action may be to apply penalty for overdue debt (AppliedCustomerPenaltyCharge that is a type of Charge);
- Another type of dunning action may be to create a CustomerProductOrder that will apply a limitation Product on the customer's existing Products (Ex: limit to national calls) and even a CustomerProductOrder that will remove all the Customer's Products and ProductOfferingSpecifications.

When all the Customer's Products and ProductOfferingInstances are removed a closing CustomerBill is produced, including the rented material goods price;

The last action done by the Dunning process is to produce a DunningWriteOff.

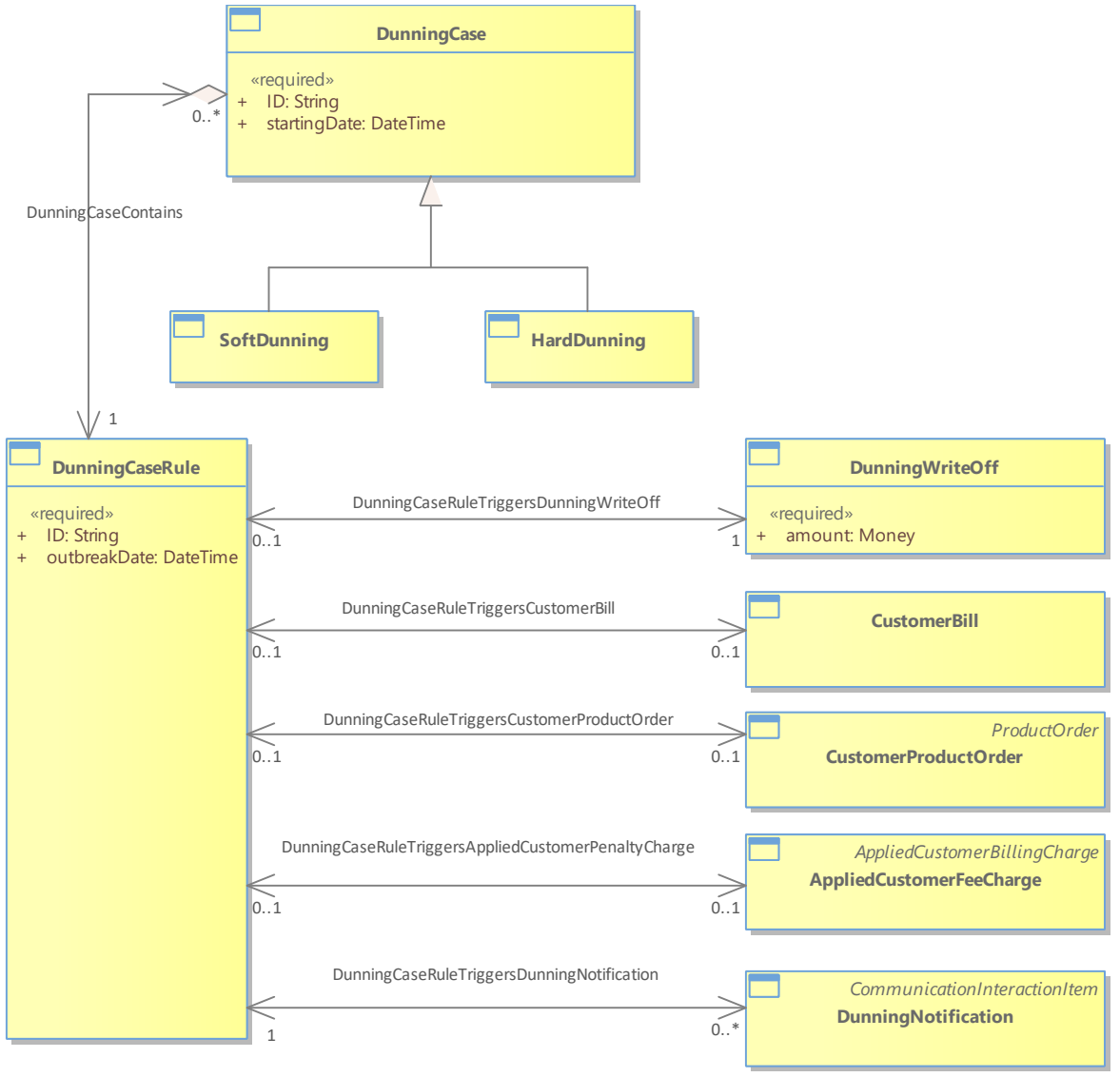


Figure C.23 - Dunning Result

Figure C.23-01– Dunning Result example

The following example illustrates the application of a dunning scenario for a specific customer.

In this example, John Smith has a contract with the provider/operator. Therefore, he is liable for eventual debt that could be incurred on his CustomerBillingAccount.

Mary Smith plays the role of Payer and pays the debt of John Smith' CustomerBillingAccount.

As no specific dunning scenario has been assigned to John Smith' CustomerBillingAccount, it follows the Standard MassMarket Dunning Scenario.

As Mary Smith didn't pay the due debt of the CustomerBill for 8 days, a DunningCase is created starting by the first step.

In accordance with the DunningRule, a reminder letter is sent to Mary Smith (the Payer).

As no payment has been received from Mary Smith, the second step of the Dunning Scenario is triggered. The CSR (Customer Service Representative) calls Mary Smith.

And hopefully, the interaction with Mary Smith led to a Payment covering the complete debt.

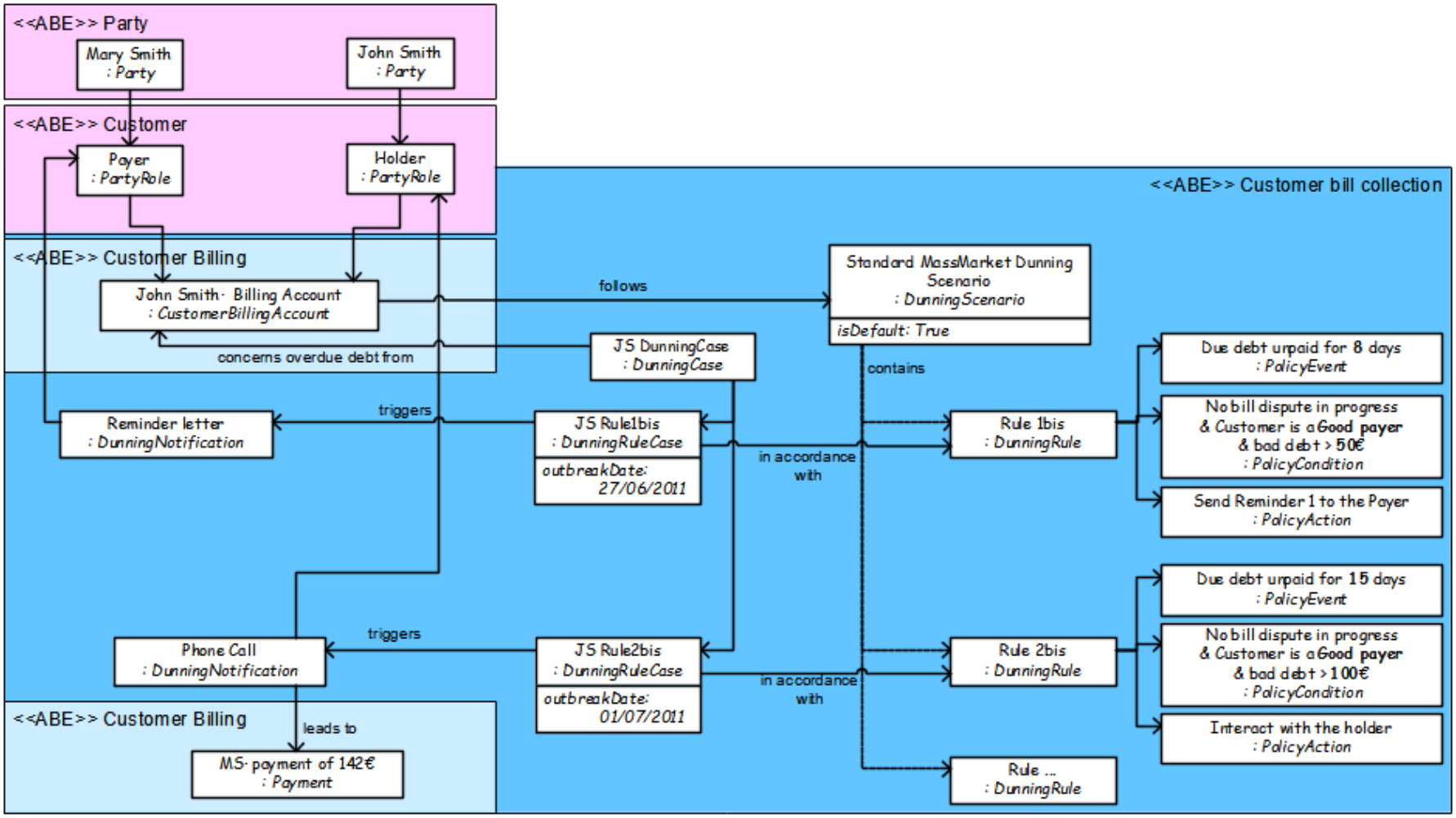


Figure C.23-01– Dunning Result example

4.6.1 Customer Payment ABE

The Customer Payment ABE represents the transfer of wealth from a customer for a product or usage of product.

Figure CP.01 - Customer Payment ABE Related Entities

Following are the business entities aggregated under the Customer Payment Aggregate Business Entity.

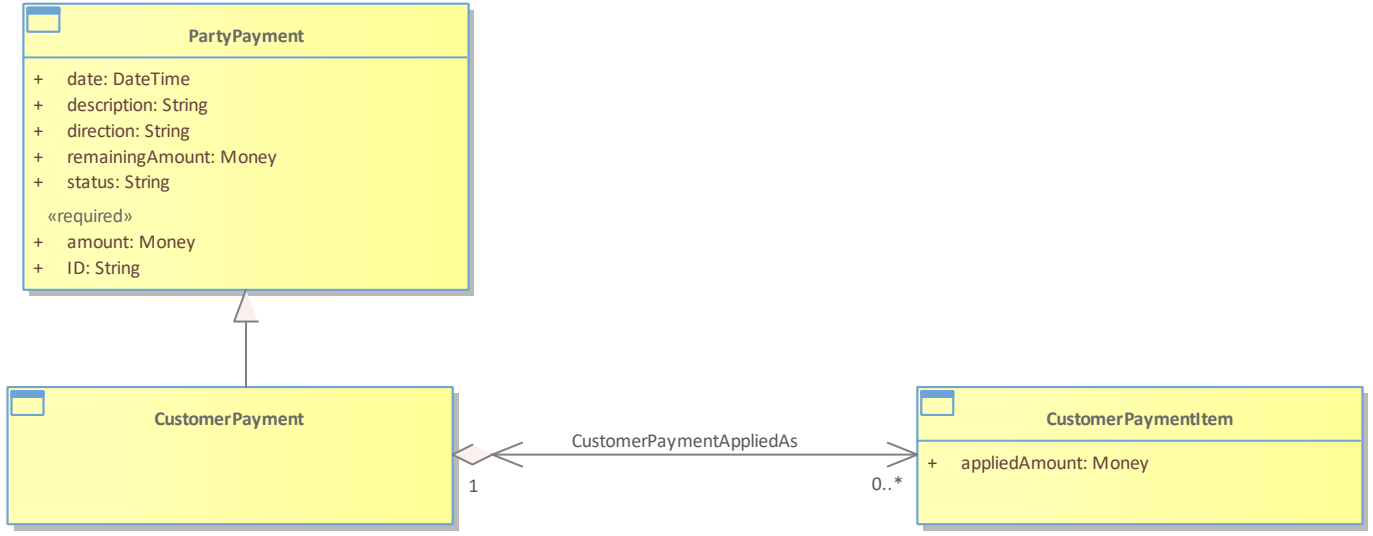


Figure CP.01 - Customer Payment ABE Related Entities

4.6.2 Dunning ABE

The Dunning ABE represents attempts to collect payment from a customer for overdue payments.

Figure Dun.01 - Dunning ABE Related Entities

Following are the business entities aggregated under the Dunning Aggregate Business Entity.

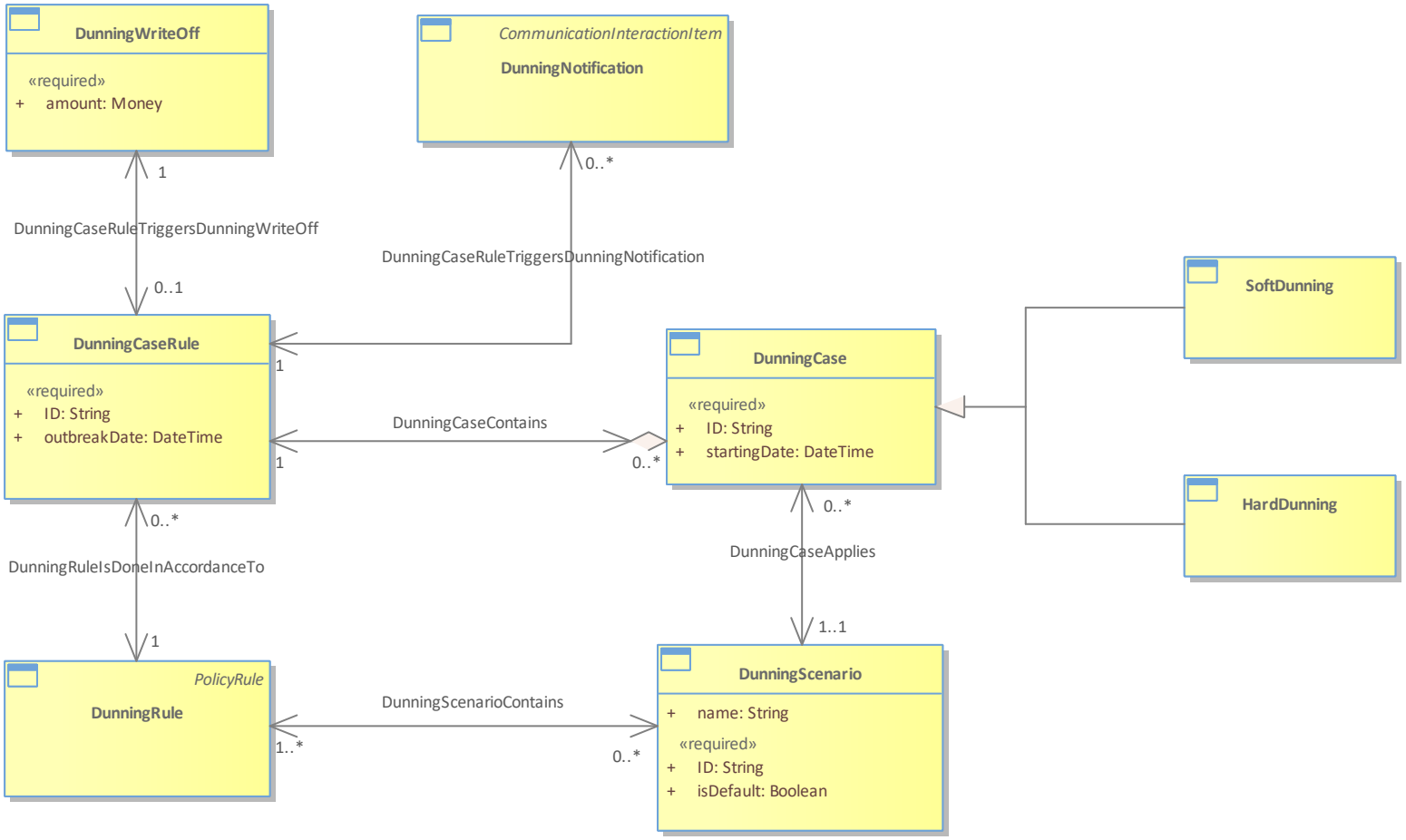


Figure Dun.01 - Dunning ABE Related Entities

4.7 Customer Problem ABE

The **Customer Problem ABE** focuses on technical assistance and problem handling for customers.

Figure C.08 - Customer Problem Context

CustomerProblem is a type of business interaction which represents a problem which affects the customer. Such a problem can be a problem with the customer products (such as low quality of service), customer bills (such as unexpected high bill) or any other problem which influences the customer experience. CustomerProblem can be raised by the customer who noticed a problem, or by the CSP (using some analytics tools) which detects a problem and proactively work on solving it before the customer complains.

CustomerProblems may be nested for 2 business reasons:

- For attaching root cause problem to multiple reported CustomerProblems (typically related to multiple customers)
- For breaking a CustomerProblem to sub problems (typically when customer reports many problems during one call).

CustomerProblem may involve multiple parties, some of them are known PartyRoles (such as Customers) and some play a temporary role just for this problem (such as the reporter of the problem). For the latter cases the CSP can choose whether to create a PartyRole for a problem reporter or just use PartyInvolvementRole as association to Party rather than to PartyRole.

This part of the model is described in the following diagram:

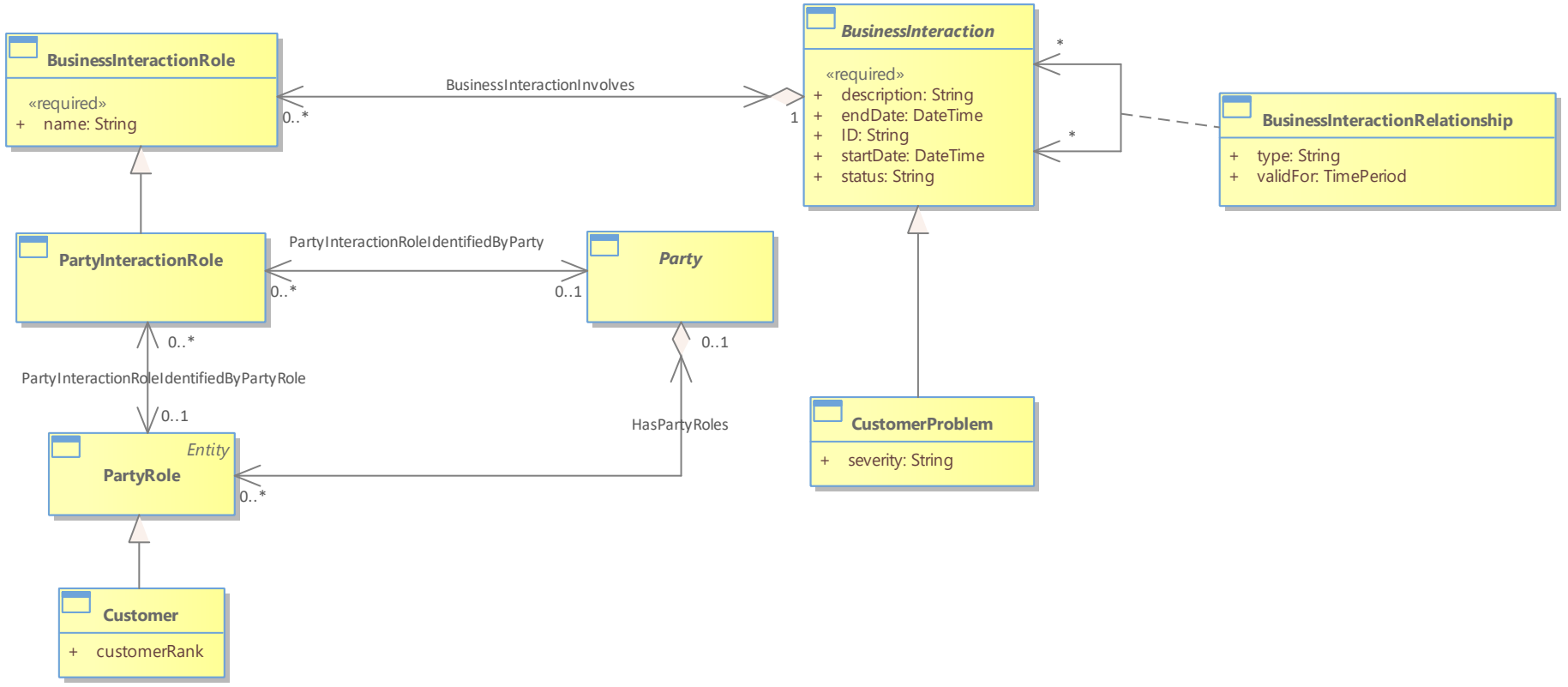


Figure C.08 - Customer Problem Context

Figure C.09 - Customer Problem Model

A CustomerProblem may be associated with CustomerProblemTask(s) which represent a trackable task delegated from the CustomerProblem with a specified due date. CustomerProblem may also be an instance of a problem known to the service provider, optionally with a workaround to bypass this problem, in such a case, a KnownProblemDescription may be associated with the CustomerProblem.

A CustomerProblem is also optionally associated with Attachment (through inheritance from BusinessInteraction), typically such as Attachment represents a document (such as screenshot or diagnostics report) that the Customer provides that depicts the problem he encounters.

When a CustomerProblem is closed a CloseCustomerProblemSummary entity which records the closure activity is created. A CustomerProblem may associate to more than one CloseCustomerProblemSummary since a problem can be closed and then reopened (typically by the customer) if the problem is not solved.

The following diagram shows the CustomerProblem model:

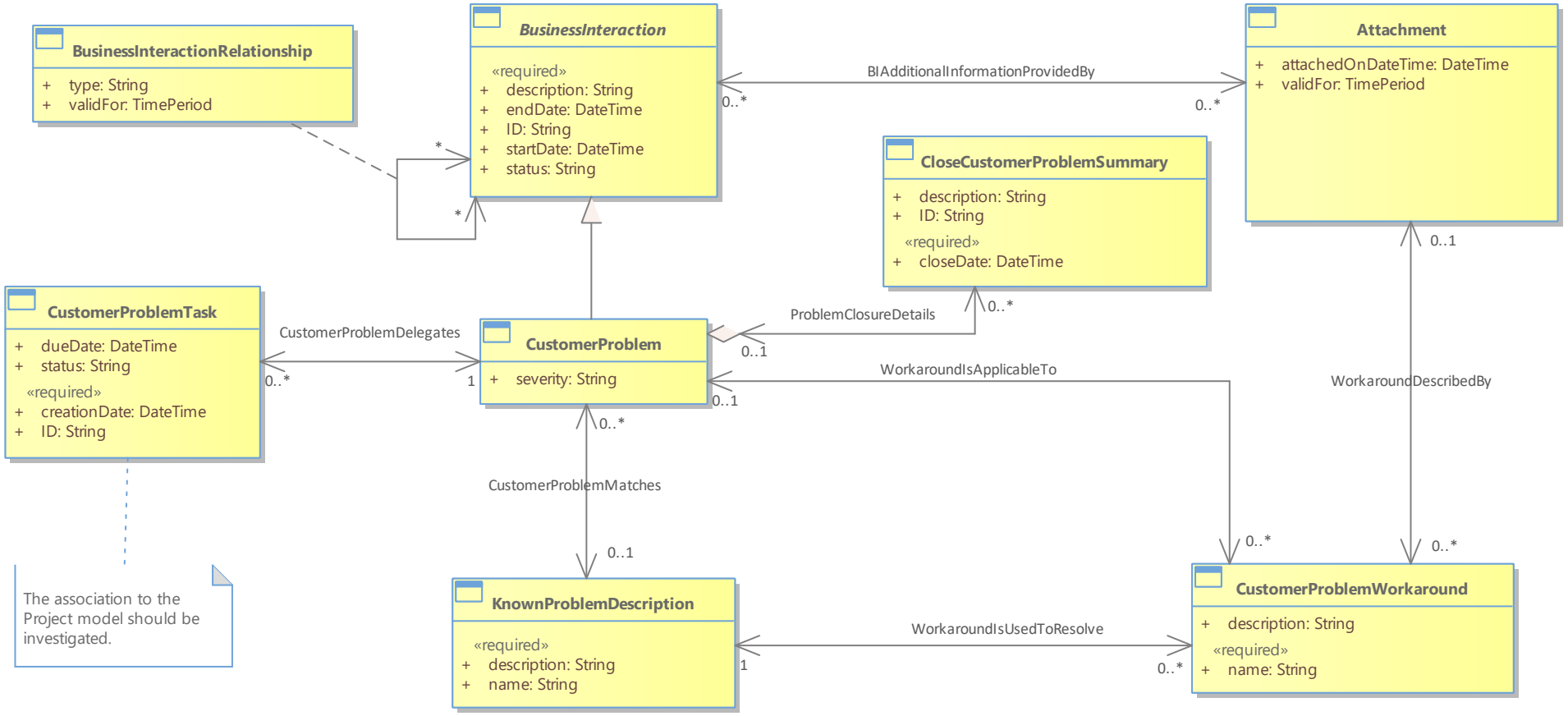


Figure C.09 - Customer Problem Model

Figure C.10 - Customer Problem Full Model

The full CustomerModel (context and ABE model) is depicted in the diagram below:

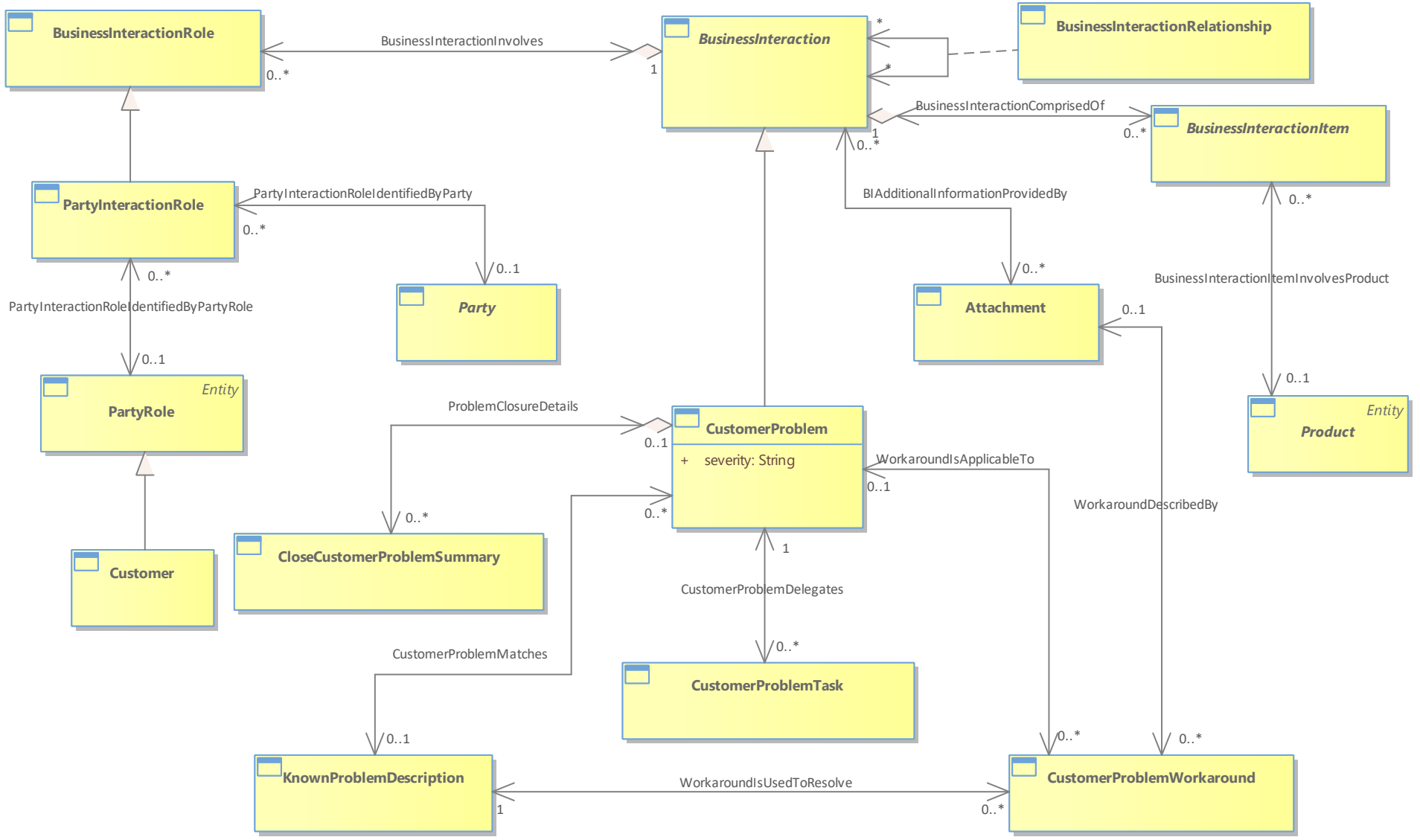


Figure C.10 - Customer Problem Full Model

4.8 Customer Interaction ABE

The **Customer Interaction ABE** represents communications with customers, and the translation of customer requests and inquiries into appropriate "events" such as the creation of a customer product order, the creation of a customer bill inquiry, or the creation of a customer problem.

Figure C.05 - Customer Interaction: Types of Requests

The Customer Interaction Aggregate Business Entity has not been fully detailed at the time of this writing. Currently, there are six business entities in the model as shown in the figure below. Customer interactions take the form of requests (CustomerInquiry, CustomerBillInquiry, and CustomerInvoiceInquiry) and responses (CustomerQuoteOrOffer).

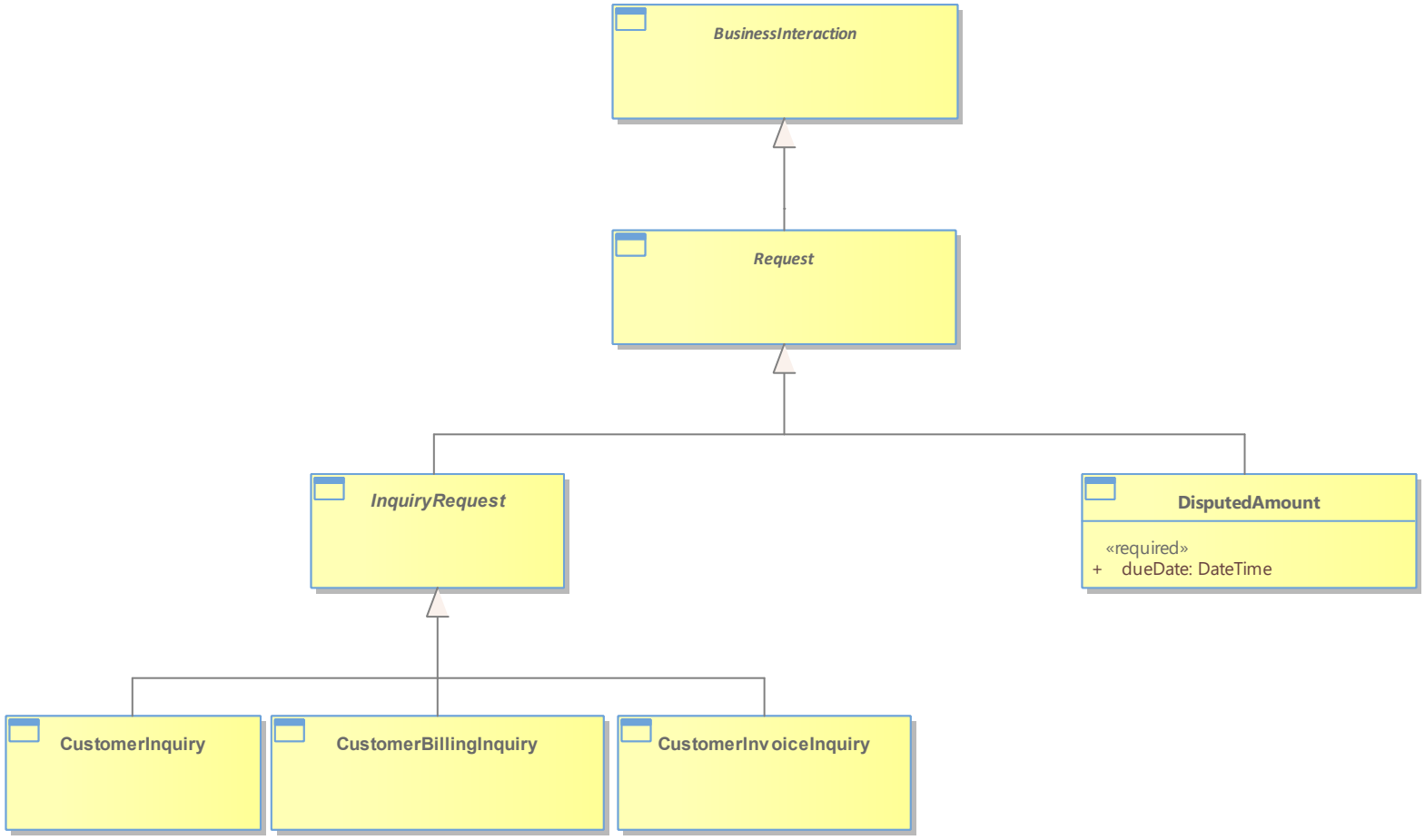


Figure C.05 - Customer Interaction: Types of Requests

Figure C.06 - Customer Interaction: Types of Responses

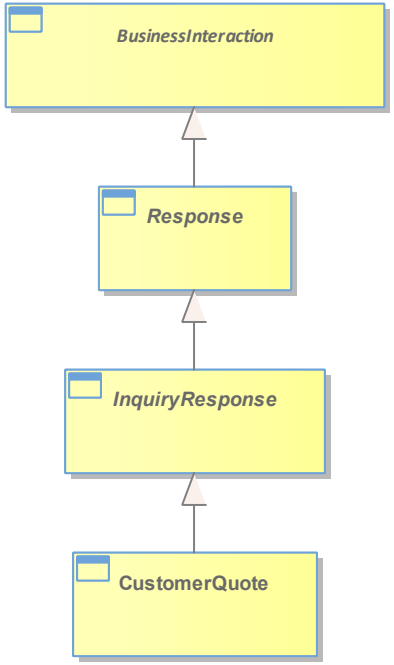


Figure C.06 - Customer Interaction: Types of Responses

4.9 Customer Service Level Agreement ABE

The **Customer SLA ABE** is a special case of the Service Level Agreement ABE where an involved party in the agreement is a Customer.

Figure C.04 - Customer Service Level Agreement Business Entities

A Customer Service Level Agreement differs from other types of Service Level Agreements due to the fact that a Customer is one of the PartyRoles involved in the Service Level Agreement, while other roles are involved in other types of agreements. For example, a Supplier is involved in a Supplier Service Level Agreement. See GB922 Agreement Guidebook for details of Agreements and Service Level Agreements. See GB922 Service Overview Guidebook for details of Service Level Specifications and Service Level Objectives.

The figure below provides an overview of a Service Level Agreement. It does not show all of the relevant associations to reduce the complexity of the figure. In particular, associations that BusinessInteraction or BusinessInteractionItems have with other entities are suppressed. Two examples of this are the suppression of the association between a BusinessInteractionItem and a ProductOfferingSpecification as well as the association between a BusinessInteraction and a Customer playing a PartyRole.

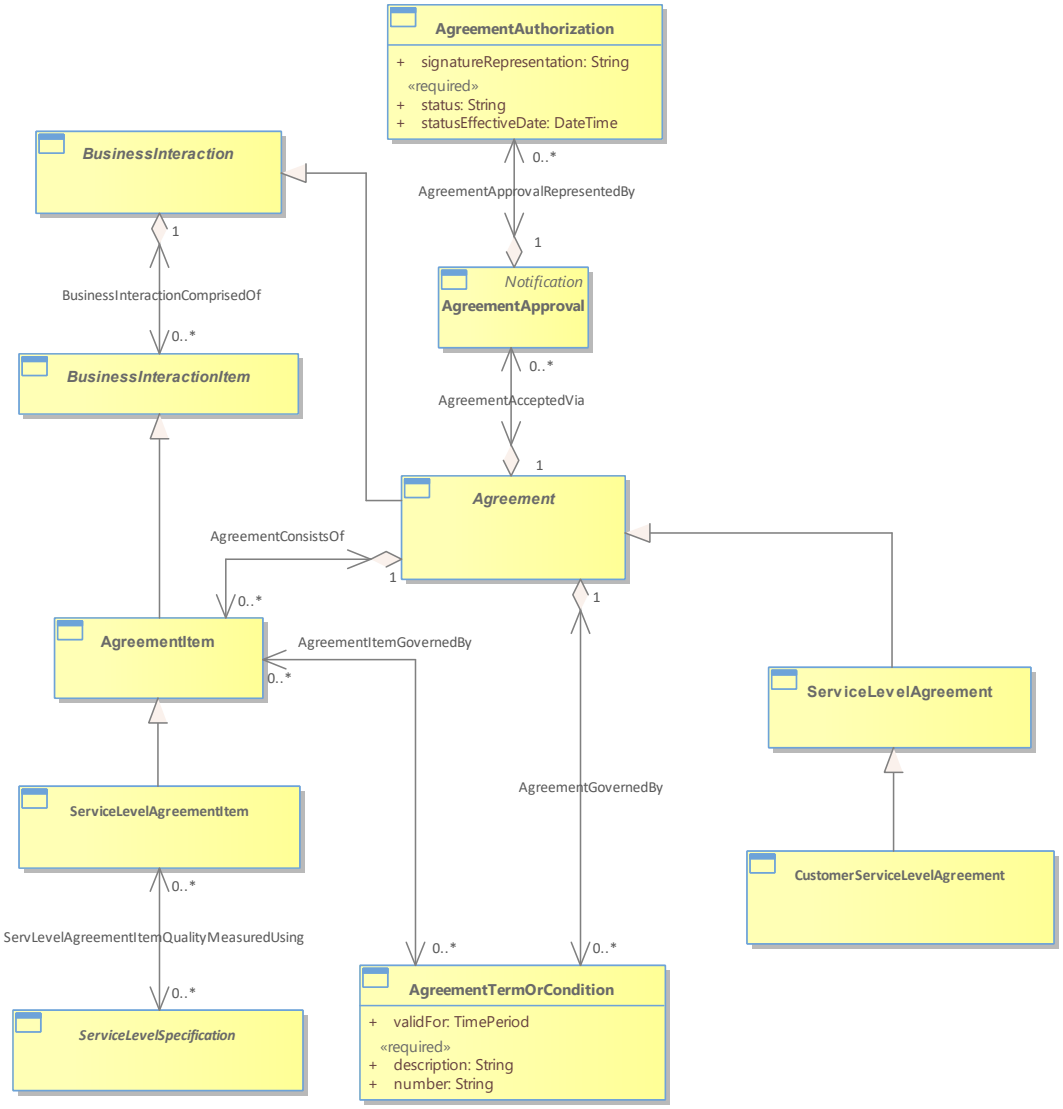


Figure C.04 - Customer Service Level Agreement Business Entities

4.10 Customer Statistic ABE «notFullyDeveloped»

The **Customer Statistic ABE** represents the analysis of customer usage patterns, customer profitability statistics and churn and retention statistics.

Figure C.15 - Customer Billing Statistic, Part 1

The CustomerBillingStatistic and related business entities are used to model various totals and other statistical data associated with a customer account and its products that are of billing process interest over a certain period of time. For example, they can represent customer account total annual revenue or total volume of product usage per quarter. Application of various billing credits (e.g. discount, credit) can be triggered by billing statistic data meeting (for example, exceeding) a certain value.

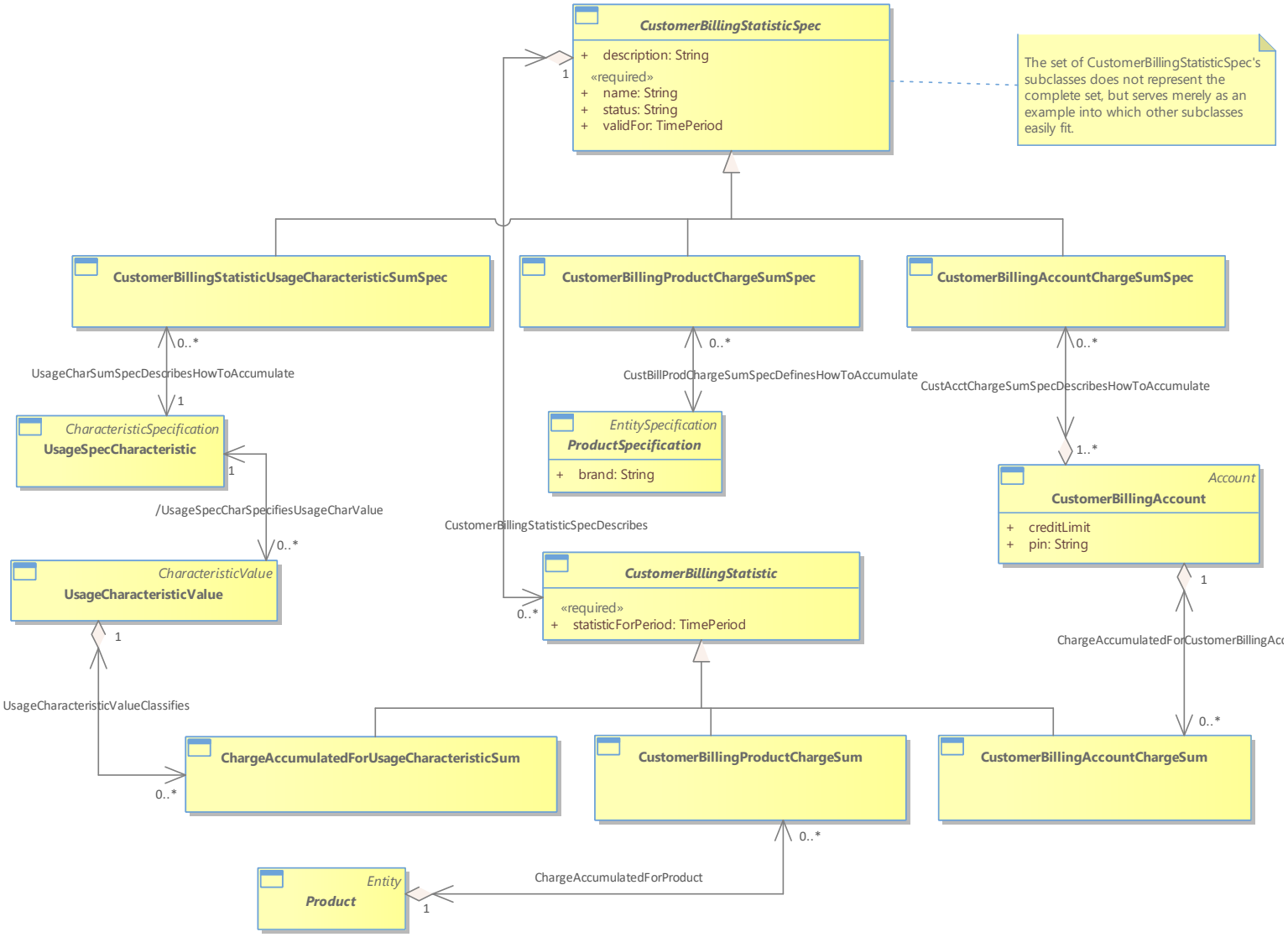


Figure C.15 - Customer Billing Statistic, Part 1

Figure C.16 - Customer Billing Statistic, Part 2

The CustomerBillingStatisticSpec is used to describe the statistic that needs to be collected. The UsageCharacteristicSumSpec describes the collection of usage characteristic statistic (for example, the total sum of the duration of voice calls in a month). Policy rules can be used to define, which statistic data are of the billing process interest, when they should be created and expired, how they should be calculated, and what actions should be triggered when statistic data meet certain conditions.

CustomerBillingStatistic entity instances are typically created and updated during rating and billing process. Since a quantity represented by CustomerBillingStatistic changes over time corresponding Balance entities are used to track its history as shown in the figure below.

For example, for a certain product a billing system may track total number of kilobytes transferred over GPRS connection per quarter. The total sum is recorded by a billing system and stored in an instance of UsageCharacteristicSum entity. When a certain volume is exceeded a DiscountProductPriceAlteration instance may be generated entitling customer to a certain discount.

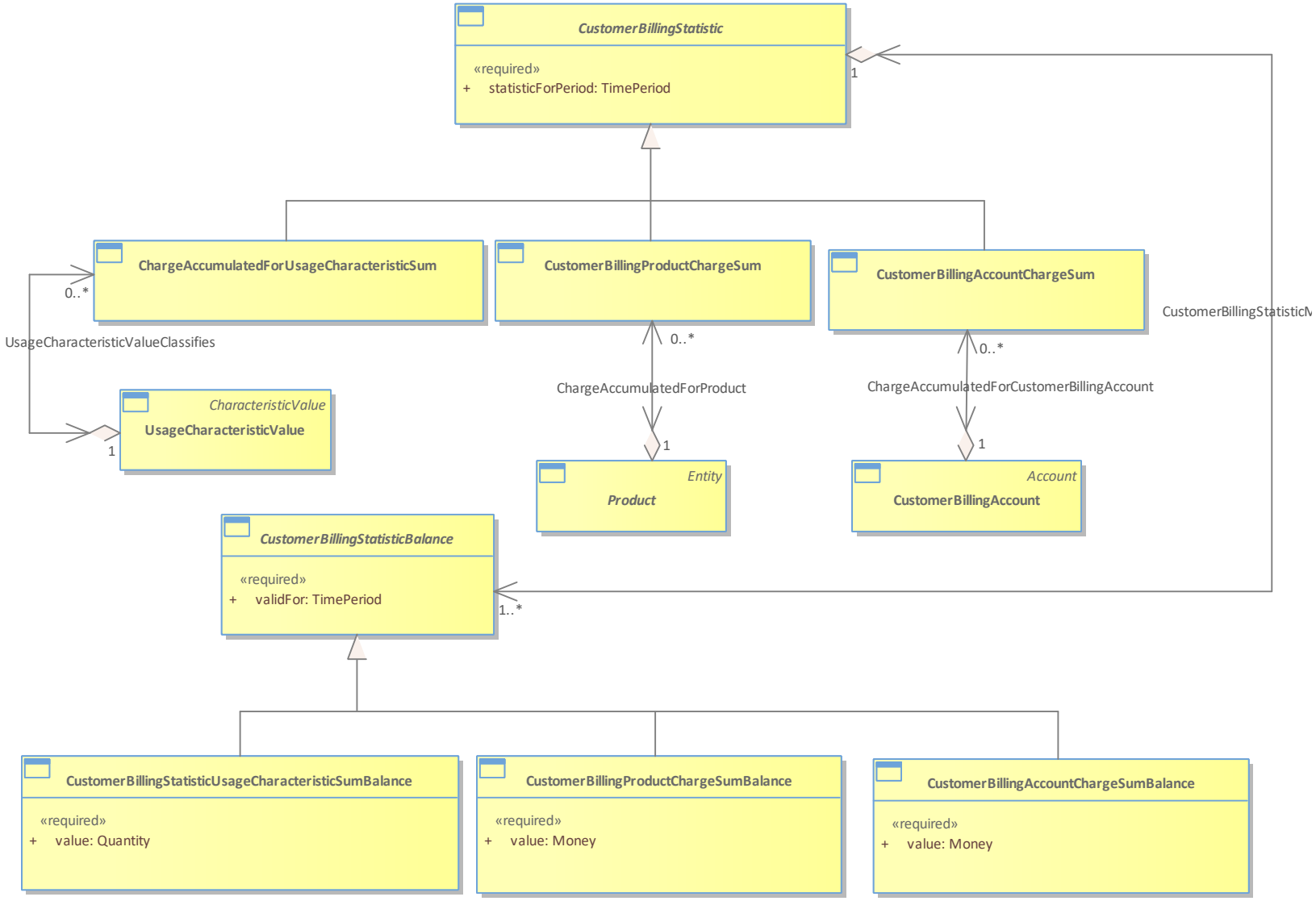


Figure C.16 - Customer Billing Statistic, Part 2

4.11 Customer Billing Inquiry and Dispute ABE «notFullyDeveloped»

The **Customer Billing Inquiry and Dispute ABE** represents requests for information and disputes related to invoices (CustomerBill) sent to the Customer and / or charges (AppliedCustomerBillingCharge).

Figure CBI.01 - Customer Billing Inquiry and Dispute ABE Related Entities

The **Customer Billing Inquiry and Dispute ABE** represents requests for information and disputes related to invoices (CustomerBill) sent to the Customer and / or charges (AppliedCustomerBillingCharge).

CustomerBillingDispute inherits from RootEntity. Thanks to this inheritance, it can be a result of CommunicationInteraction.

A CustomerBillingDispute can be related to a CustomerBillingInquiry.

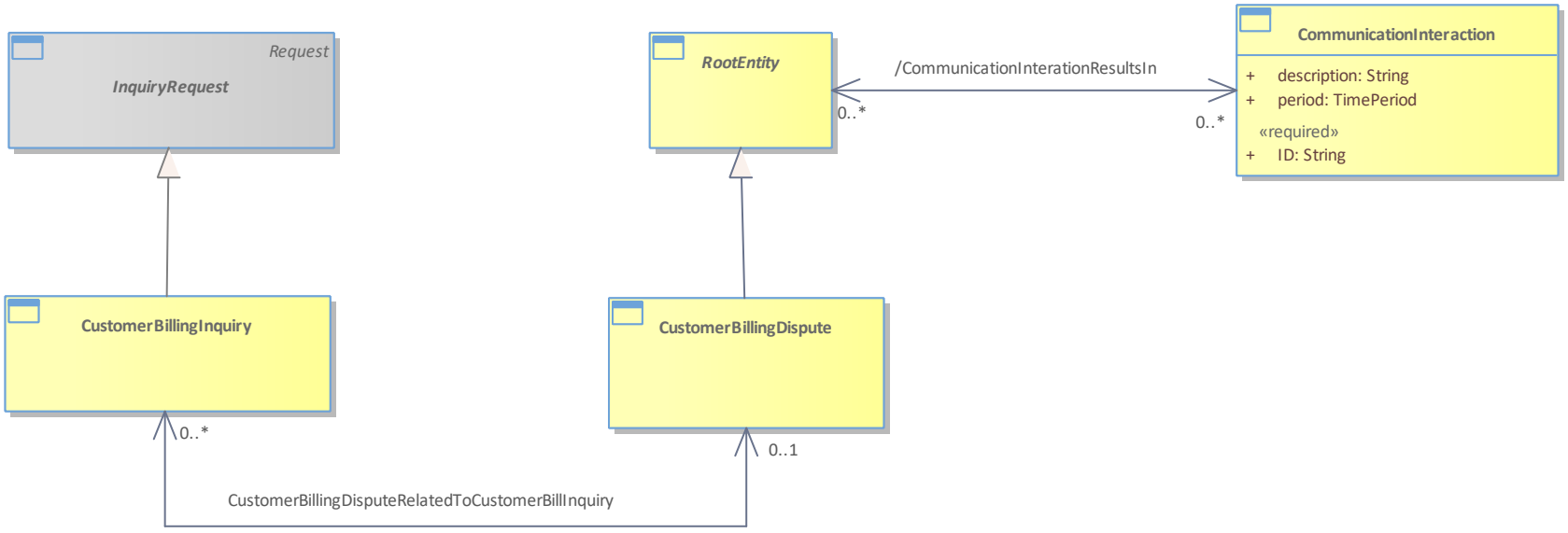


Figure CBI.01 - Customer Billing Inquiry and Dispute ABE Related Entities

Figure CBI.02 - CustomerBillingDispute associations to other business entities

As a result of a CommunicationInteraction, a CustomerBillingDispute can be produced to materialize a disagreement on several CustomerBill and / or AppliedCustomerBillingCharge.

CustomerBillingDispute will follow a clearly defined lifecycle where it will be studied by the Service Provider teams. The study result can be either a rejection of the CustomerBillingDispute or a validation of it.

If the CustomerBillingDispute is validated, it can be solved either:

- Through an AppliedCustomerBillingRebate,

- Through 0 to many AppliedCustomerBillingChargeAdjustment (to fix incorrect AppliedCustomerBillingCharge),

- Through 0 to many AppliedCustomerBillAdjustment (to fix incorrect CustomerBill).

AppliedCustomerBillingChargeAdjustment can concern serveral AppliedCustomerBillingCharge. AppliedCustomerBillAdjustment concerns only one CustomerBillingAccount.

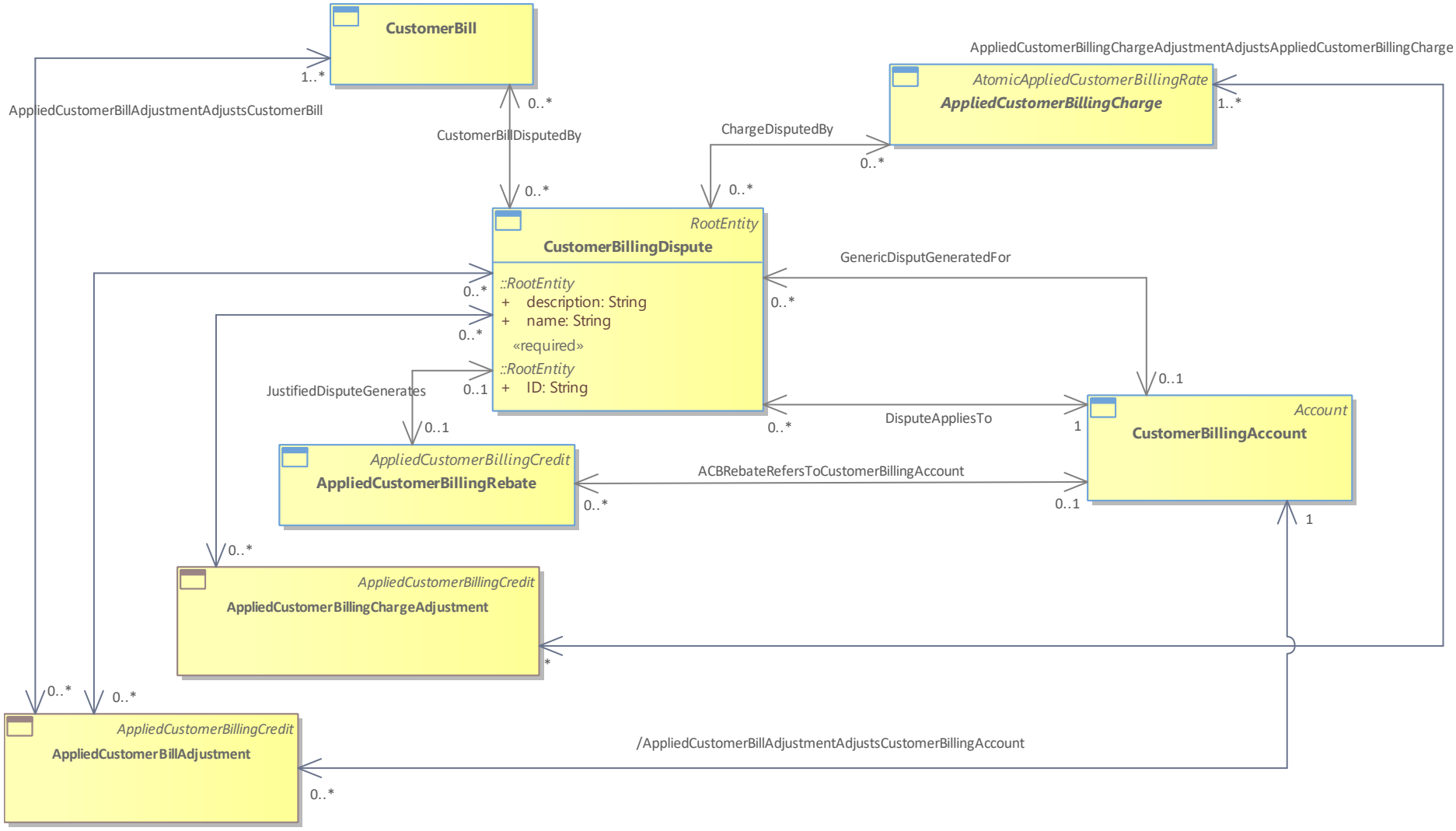


Figure CBI.02 - CustomerBillingDispute associations to other business entities

Figure CBI.03 - CustomerBillingDispute Lifecycle

A CustomerBillingDispute is created as a result of a CommunicationInteraction. It is then sent to the appropriate team to study its validity.

The study determines if the CustomerBillingDispute is accepted or rejected.

If the CustomerBillingDispute is rejected, the lifecycle is finished.

If the CustomerBillingDispute is validated,

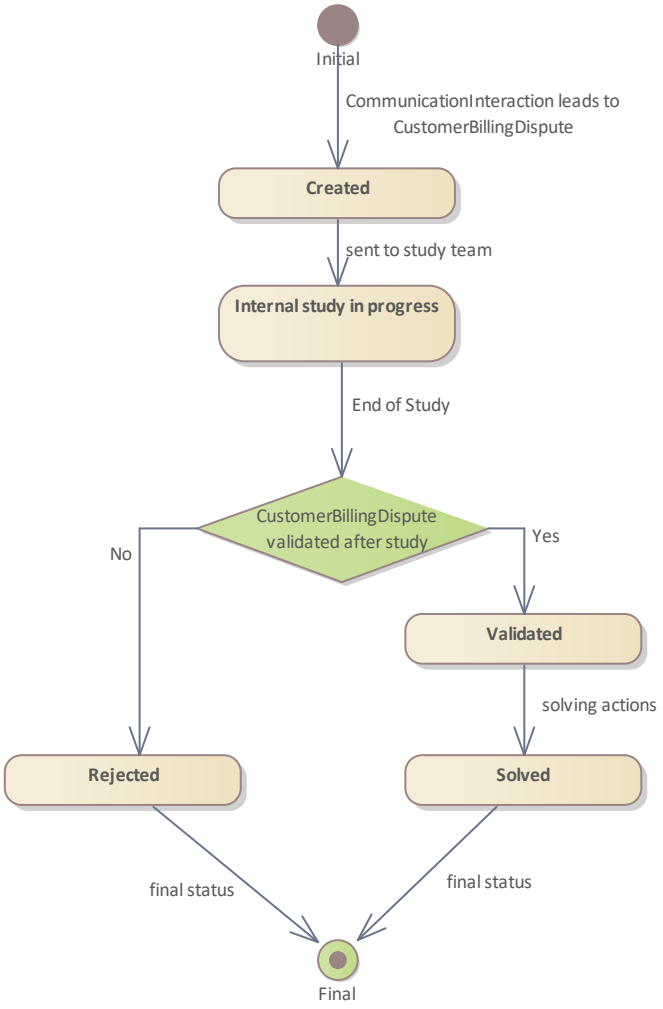


Figure CBI.03 - CustomerBillingDispute Lifecycle

5 Administrative Appendix

This Appendix provides additional background material about the TM Forum and this document. In general, sections may be included or omitted as desired; however, a Document History must always be included.

5.1 About this document

This is a TM Forum Guidebook. The guidebook format is used when:

The document lays out a 'core' part of TM Forum's approach to automating business processes. Such guidebooks would include the Telecom Operations Map and the Technology Integration Map, but not the detailed specifications that are developed in support of the approach.

Information about TM Forum policy, or goals or programs is provided, such as the Strategic Plan or Operating Plan.

Information about the marketplace is provided, as in the report on the size of the OSS market.

5.2 Document History

Version History

Version Number	Date	Modified by:	Purpose
0.1	Jan 2002		GB922 Addendum Template created from TMF407 v1.1 Guidebook template
0.5	May 2002		Initial member review version
1.0	June 2002		Formatted for Member Evaluation
1.1	Oct 2002		Phase II updates

Version Number	Date	Modified by:	Purpose
3.0	May 2003		Phase III updates, including updated association and attribute names.
5.0	June 2004		Updates based on member feedback.
5.1	August 2004		Synchronized with other Addenda
5.2	February 2005		Update based on member feedback
6.0a	April 2005		Update based on member feedback
6.0b	July 2005	John Reilly	Updated with Marand's Billing model
6.1	November 2005	Tina O'Sullivan	Converted to new template and corrected various administrative items.
6.2	November 2005	Tina O'Sullivan	Figure label
6.3	November 2005	Tina O'Sullivan	realigned a number of Figures
6.4		Tina O'Sullivan	Updated notice statement & document status
6.5	May 2009	Alicja Kawecki	Minor updates to reflect TM Forum Approved status
9.0	Jan 2010	Josh Salomon	Applied CR artf1869 - needed to change diagram C.12 to reflect entity name change
9.1	Apr 2010	Alicja Kawecki	Minor corrections for web posting and ME
9.2	Jun 2010	Alicja Kawecki	Updated Notice
9.3	Oct 2010	Alicja Kawecki	Updated to reflect TM Forum Approved status
9.5	Nov 2010	Sihao Li	Updated with customer payment model proposed by Huawei
9.6	Mar 2011	Alicja Kawecki	Minor formatting corrections prior to web posting and ME
9.7	Sep 2011	Alicja Kawecki	Updated to reflect TM Forum Approved status
9.8	Jan 2012	Josh Salomon	Updated with FinancialCharge and DisputedAmount contributions (artf2441 and artf2647)
9.9	Mar 2012	Alicja Kawecki	Minor cosmetic corrections prior to web posting and ME
9.10	Oct 2012	Alicja Kawecki	Updated to reflect TM Forum Approved status of R12.0
10.0	July 2012	Cécile Ludwichowski	Updated with the Dunning ABE located in the Customer Bill Collection ABE
10.1	Oct 2012	Alicja Kawecki	Minor style/cosmetic corrections prior to web posting and Member Evaluation

Version Number	Date	Modified by:	Purpose
10.2	April 2013	Josh Salomon	Implemented CR artf3324
10.3	May 2013	Alicja Kawecki	Rebranding, corrected copyright in footer
10.4	June 2013	John Reilly	Deleted duplicated ID attribute in DunningNotification. Removed duplicate name attribute from ThirdPartyPayeeAgency
10.5	Sep 2013	Josh Salomon	Added CustomerProblem ABE
10.5.1	Oct 2013	Alicja Kawecki	Updated cover, header and footer
10.5.2	Mar 2014	Alicja Kawecki	Updated cover, copyright year & Notice reflecting TM Forum Approved status
10.5.3	Apr 2014	Yiling(Sammy) Liu	Added Customer Account Balance ABE
10.5.4	May 2014	Alicja Kawecki	Updated cover, header & Notice; minor formatting edits prior to posting
14.5.0	Oct 2014	Yiling(Sammy) Liu	Updated Customer Account Balance ABE and Customer Billing Credit ABE
15.0.0	Apr 2015	Yiling(Sammy) Liu	Implement CR artf2893 artf5365 artf5215 Implement CR artf5300 (Customer Payment Enhancement) Remove all Business Entity Definitions
15.0.1	May 2015	Alicja Kawecki	Updated cover, header; minor cosmetic corrections
15.5.0	Nov 2015	Cecile Ludwichowski	Updated with changes for EP Payment that impacts CustomerPayment Corrections for adding types on PaymentPlan's attribute
15.5.1	Nov 2015	Alicja Kawecki	Updated cover, minor cosmetic fixes prior to publishing
16.0.0	Apr 2016	Cécile Ludwichowski	Updated with changes for EP Order that impacts Customer Order.
16.0.1	25 May 2016	Alicja Kawecki	Minor cosmetic corrections prior to publication for Fx16
16.5.0	27-Oct-2016	Cécile Ludwichowski	Correct the Figure C.03 to remove a unidirectional relationship
16.5.1	18-Nov-2016	Alicja Kawecki	Minor cosmetic corrections prior to publication for Fx16.5
17.0.0	June 2017	Cécile Ludwichowski	Remove CustomerAccountContact replaced by PartyAccountContact
17.0.1	26 June 2017	Alicja Kawecki	Applied rebranding and minor cosmetic edits prior to publication for Fx17
17.0.2	15 November 2017	Adrienne Walcott	Minor cosmetic edits prior to publication
17.5.0	June 2017	Cécile Ludwichowski	Remove oriented navigability from CustomerOrderFurtherDefines relationship Rename PartyAccount's attributes status and type. Enhancement of Attachment (AP-852, FP-705, FP-714)
17.5.1	14-Dec-2017	Adrienne Walcott	Formatting/style edits prior to publishing

Version Number	Date	Modified by:	Purpose
17.5.2	06-Mar-2018	Adrienne Walcott	Updated to reflect TM Forum Approved Status
18.0.0	15-May-2018	Cécile Ludwichowski	Update Figure C.01 to show PartyRoleAssociation as the direct relationship InvolvedPartyRoles has been removed Replaces the relation between ProductSpecification and ProductOffering by a derived relationship that can be seen as an overview Apply new Tax exemption model
18.0.1	11-Jul-2018	Adrienne Walcott	Formatting/style edits prior to R18 publishing
18.0.2	09-Oct-2018	Adrienne Walcott	Updated to reflect TM Forum Approved Status
18.5.0	03-Dec-2018	Cécile Ludwichowski	Fixes small error on PartyBill
18.5.1	05-Mar-2019	Adrienne Walcott	Updated to reflect TM Forum Approved Status
19.0.0	20-May-2019	Cécile Ludwichowski	Complete AppliedCustomerBillingRate hierarchy and relationships
19.5.0	28-July-2019	Cécile Ludwichowski	Guide book generated from RSA with BIRT report.
20.0.0	18-May-2020	Cécile Ludwichowski	Enhance Product / Customer Order https://projects.tmforum.org/jira/browse/FX-1021?src=confmacro Enhance Customer Account ABE and add Payment as a pattern
21.0.0	04-June-2021	Cécile Ludwichowski	This release includes changes coming from the following Change Request SID - Customer Account ABE changes
21.5.0	23-Nov-2021	Cécile Ludwichowski	Introduce ShoppingCart according to the Change Request https://projects.tmforum.org/jira/browse/FX-1217 Improve ProductOrder and CustomerProductOrder according to the Change Request https://projects.tmforum.org/jira/browse/FX-1211 Introduce SalesQuote according to the Change Request https://projects.tmforum.org/jira/browse/ISA-233
22.5.0	09-Dec-2022	Cécile Ludwichowski & Kevin Scaggs	This release includes changes per the following: - Fix RSA multiplicity bug affecting diagram C.22 per ISA-378 - AppliedCustomerBillingAllowance CustomerAllowance Review and Cleanup per ISA-356 - Move from RSA to Sparx Enterprise Architect modeling tool

Version Number	Date	Modified by:	Purpose
			- Added a simple diagram for ABEs containing business entities and relationships, but no diagram
24.5.0	17-Jan-2025	Kevin Scaggs	This release includes changes to the Product Guidebook per the following: • Enhancements to Bill Inquiry ABE, including being renamed Customer Billing Inquiry and Dispute per ISA-962 • Various updates related to Product Offering changes per ISA-1054 • Level 1 ABE definition enhancements per ISA-1113 • Refinement to Figure C.03a per ISA-1141

Release History

Release Number	Date Modified	Modified by:	Description of changes
Release 6.0	31-Oct-2005	J. Reilly	
Release 9.0	3-Jan-2010	J. Salomon	Changed diagram C.12
Release 9.5	20-Nov-2010	Sihao Li	Updated with customer payment model proposed
Release 12.0	30-Jan-2012	Josh Salomon	Updated with FinancialCharge and DisputedAmount contributions

Release Number	Date Modified	Modified by:	Description of changes
Release 12.5	5-Oct-2012	Cécile Ludwichowski	Updated with the Dunning ABE located in the Customer Bill Collection ABE
Release 13.0	24-Apr-2013	Josh Salomon John Reilly	Updated with onCycle and OffCycle Customer Bills. Deleted duplicated ID attribute in DunningNotification. Removed duplicate name attribute from ThirdPartyPayeeAgency.
Release 13.5	29-Sep-2013	Josh Salomon	Added CustomerProblem ABE
Release 14.0	31-Apr-2014	Yiling(Sammy) Liu Cécile Ludwichowski	Added Customer Account Balance ABE Added LoyatyBurnPM as a sub-class of PaymentMethod
Release 14.5	31-Oct-2014	Yiling(Sammy) Liu	Updated Customer Account Balance ABE and Customer Billing Credit ABE
Release 15.0.0	Apr 2015	Yiling(Sammy) Liu	Implement CR artf2893 artf5365 artf5215 Implement CR artf5300 (Customer Payment Enhancement) Remove all Business Entity Definitions
Release 15.5.0	9-Nov-2015	Cecile Ludwichowski	Updated with changes for EP Payment that impacts CustomerPayment Corrections for adding types on PaymentPlan's attribute
Release 16.0.0	27-Apr-16	Cécile Ludwichowski	Updated with changes for EP Order that impacts Customer Order.
Release 16.5.0	27-Oct-2016	Cécile Ludwichowski	Correct the Figure C.03 to remove a unidirectional relationship
Release 17.0.0	June 2017	Cécile Ludwichowski	Remove CustomerAccountContact replaced by PartyAccountContact
Release 17.0.1	November 2017	Adrienne Walcott	Updated to reflect TM Forum Approved Status
Release 17.5.0	December 2017	Cécile Ludwichowski	Remove oriented navigability from CustomerOrderFurtherDefines relationship Rename PartyAccount's attributes status and type. Enhancement of Attachment (AP-852, FP-705, FP-714)
Release 17.5.1	06 Mar 2018	Adrienne Walcott	Updated to reflect TM Forum Approved Status
Release 18.0.0	15 May 2018	Cécile Ludwichowski	Update Figure C.01 to show PartyRoleAssociation as the direct relationship InvolvedPartyRoles has been removed Replaces the relation between ProductSpecification and ProductOffering by a derived relationship that can be seen as an overview Apply new Tax exemption model
Release 18.0.1	09-Oct-2018	Adrienne Walcott	Updated to reflect TM Forum Approved Status

Release Number	Date Modified	Modified by:	Description of changes
Release 18.5.0	03-Dec-2018	Cécile Ludwichowski	Fixes small error on PartyBill
18.5.1	05-Mar-2019	Adrienne Walcott	Updated to reflect TM Forum Approved Status
19.0.0	20-May-2019	Cécile Ludwichowski	Complete AppliedCustomerBillingRate hierarchy and relationships
19.5.0	28-July-2019	Cécile Ludwichowski	Guide book generated from RSA with BIRT report.
20.0.0	18-May-2020	Cécile Ludwichowski	Enhance Product / Customer Order https://projects.tmforum.org/jira/browse/FX-1021?src=confmacro Enhance Customer Account ABE and add Payment as a pattern
21.0.0	04-June-2021	Cécile Ludwichowski	This release includes changes coming from the following Change Request SID - Customer Account ABE changes
21.5.0	23-Nov-2021	Cécile Ludwichowski	Introduce ShoppingCart according to the Change Request https://projects.tmforum.org/jira/browse/FX-1217 Improve ProductOrder and CustomerProductOrder according to the Change Request https://projects.tmforum.org/jira/browse/FX-1211 Introduce SalesQuote according to the Change Request https://projects.tmforum.org/jira/browse/ISA-233
22.5.0	09-Dec-2022	Cécile Ludwichowski & Kevin Scaggs	This release includes changes per the following: - Fix RSA multiplicity bug affecting diagram C.22 per ISA-378 - AppliedCustomerBillingAllowance CustomerAllowance Review and Cleanup per ISA-356 - Move from RSA to Sparx Enterprise Architect modeling tool - Added a simple diagram for ABEs containing business entities and relationships, but no diagram
24.5.0	17-Jan-2025	Kevin Scaggs	This release includes changes to the Product Guidebook per the following:

Release Number	Date Modified	Modified by:	Description of changes
			• Enhancements to Bill Inquiry ABE, including being renamed Customer Billing Inquiry and Dispute per ISA-962 • Various updates related to Product Offering changes per ISA-1054 • Level 1 ABE definition enhancements per ISA-1113 • Refinement to Figure C.03a per ISA-1141

5.3 Acknowledgments

This document was prepared by the members of the TM Forum Information Framework (SID) team.

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