

PAIX Platform API - Database Schema Documentation

This document provides comprehensive documentation of all database tables, their columns, relationships, and business logic for the PAIX Bill Automation Platform.

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Overview

The PAIX Platform uses a **multi-tenant architecture** with PostgreSQL and TypeORM. All entities follow a consistent pattern with UUID primary keys, audit trails, and soft deletes.

Architecture Pattern

Customer (Tenant) → Companies → Users → Roles → Bill Accounts → Bills → Payments

Base Entity Pattern

All entities extend `BaseEntity` with standard audit fields:

`base_entity` (Abstract)

Column	Type	Constraints	Description
<code>id</code>	UUID	PRIMARY KEY, NOT NULL	Unique identifier
<code>created_at</code>	TIMESTAMP	NOT NULL, DEFAULT NOW()	Record creation timestamp
<code>updated_at</code>	TIMESTAMP	NOT NULL, DEFAULT NOW()	Last update timestamp
<code>deleted_at</code>	TIMESTAMP	NULL	Soft delete timestamp

Column	Type	Constraints	Description
version	INTEGER	NOT NULL, DEFAULT 1	Optimistic locking version

Features: - UUID primary keys for security - Automatic timestamp management - Soft delete support - Optimistic locking for concurrency

Core Entities

customer - Multi-Tenant Root Entity

Purpose: Top-level tenant organization that isolates data between different customers.

Column	Type	Constraints	Description
id	UUID	PRIMARY KEY	Inherited from BaseEntity
name	VARCHAR(255)	NOT NULL	Customer organization name
legal_entity_number	VARCHAR(50)	NOT NULL, UNIQUE	Legal registration number
country_iso	VARCHAR(3)	NOT NULL	ISO country code
created_at	TIMESTAMP	NOT NULL	Inherited from BaseEntity
updated_at	TIMESTAMP	NOT NULL	Inherited from BaseEntity
deleted_at	TIMESTAMP	NULL	Inherited from BaseEntity
version	INTEGER	NOT NULL	Inherited from BaseEntity

Relationships: - companies: OneToMany → company.customer_id - users: OneToMany → user.customer_id

Business Rules: - Each customer is completely isolated - Legal entity number must be unique globally - Serves as the root of the tenant hierarchy

company - Customer Sub-Organizations

Purpose: Companies belong to customers and represent business units or subsidiaries.

Column	Type	Constraints	Description
id	UUID	PRIMARY KEY	Inherited from BaseEntity
name	VARCHAR(255)	NOT NULL	Company name
reg_no	VARCHAR(50)	NOT NULL, UNIQUE	Company registration number
is_active	BOOLEAN	NOT NULL, DEFAULT TRUE	Active status
customer_id	UUID	NOT NULL, FK	Reference to customer
address_id	UUID	NOT NULL, FK	Reference to address
created_at	TIMESTAMP	NOT NULL	Inherited from BaseEntity
updated_at	TIMESTAMP	NOT NULL	Inherited from BaseEntity
deleted_at	TIMESTAMP	NULL	Inherited from BaseEntity
version	INTEGER	NOT NULL	Inherited from BaseEntity

Relationships: - customer: ManyToOne → customer.id (CASCADE DELETE) - address: ManyToOne → address.id (CASCADE INSERT/UPDATE, EAGER) - user_roles: OneToMany → user_role.company_id

Business Rules: - Companies are deleted when customer is deleted - Each company has one physical address - Registration number must be unique globally - Can be activated/deactivated

user - Platform Users

Purpose: Users belonging to customers with role-based access to companies.

Column	Type	Constraints	Description
id	UUID	PRIMARY KEY	Inherited from BaseEntity
email	VARCHAR(255)	NOT NULL, UNIQUE	User email address
first_name	VARCHAR(100)	NOT NULL	User first name
last_name	VARCHAR(100)	NOT NULL	User last name
password_hash	VARCHAR(255)	NOT NULL	Hashed password (excluded from responses)
current_hashed_refresh_token	VARCHAR(255)	NULL	Hashed refresh token (excluded)

Column	Type	Constraints	Description
<code>status</code>	ENUM	NOT NULL, DEFAULT 'PENDING'	User status
<code>customer_id</code>	UUID	NOT NULL, FK	Reference to customer
<code>created_at</code>	TIMESTAMP	NOT NULL	Inherited from BaseEntity
<code>updated_at</code>	TIMESTAMP	NOT NULL	Inherited from BaseEntity
<code>deleted_at</code>	TIMESTAMP	NULL	Inherited from BaseEntity
<code>version</code>	INTEGER	NOT NULL	Inherited from BaseEntity

Enums: - `UserStatus`: ACTIVE, INACTIVE, PENDING

Relationships: - `customer`: ManyToOne \rightarrow `customer.id` (CASCADE DELETE) - `user_roles`: OneToMany \rightarrow `user_role.user_id`

Business Rules: - Email must be unique globally - Users are deleted when customer is deleted - Password and refresh tokens are excluded from API responses - Users can have different roles in different companies

Authentication & Authorization

role - System Roles

Purpose: Defines available roles in the system with specific permissions.

Column	Type	Constraints	Description
<code>code</code>	VARCHAR(50)	PRIMARY KEY	Role identifier
<code>description</code>	VARCHAR(255)	NOT NULL	Human-readable description

Role Codes: - `VIEWER`: Read-only access - `EDITOR`: Can create/edit records - `APPROVER`: Can approve bills - `PAYER`: Can process payments - `CUSTOMER_ADMIN`: Full access within customer - `SUPER_ADMIN`: System-wide access

Business Rules: - Role codes are fixed system constants - No BaseEntity inheritance (system table) - Permissions defined in CASL authorization factory

user_role - User-Company-Role Junction

Purpose: Associates users with roles for specific companies (many-to-many-to-many).

Column	Type	Constraints	Description
user_id	UUID	PRIMARY KEY, FK	Reference to user
company_id	UUID	PRIMARY KEY, FK	Reference to company
role_code	VARCHAR	PRIMARY KEY, FK	Reference to role

Relationships: - user: ManyToOne \rightarrow user.id (CASCADE DELETE) - company: ManyToOne \rightarrow company.id (CASCADE DELETE) - role: ManyToOne \rightarrow role.code (CASCADE DELETE, EAGER)

Business Rules: - Composite primary key (user_id, company_id, role_code) - Users can have multiple roles per company - Users can access multiple companies - Deleted when any parent is deleted

admin - System Administrators

Purpose: System administrators with global access (separate from customer users).

Column	Type	Constraints	Description
id	UUID	PRIMARY KEY	Inherited from BaseEntity
email	VARCHAR(255)	NOT NULL, UNIQUE	Admin email
first_name	VARCHAR(100)	NOT NULL	Admin first name
last_name	VARCHAR(100)	NOT NULL	Admin last name
password_hash	VARCHAR(255)	NOT NULL	Hashed password (excluded)
current_hashed_refresh_token	VARCHAR(255)	NOT NULL	Hashed refresh token (excluded)
created_at	TIMESTAMP	NOT NULL	Inherited from BaseEntity
updated_at	TIMESTAMP	NOT NULL	Inherited from BaseEntity
deleted_at	TIMESTAMP	NULL	Inherited from BaseEntity
version	INTEGER	NOT NULL	Inherited from BaseEntity

Business Rules: - Separate authentication flow from users - Global system access - No customer association

Billing Entities

bill - Core Bill Entity

Purpose: Represents bills from billers that require processing and payment.

Column	Type	Constraints	Description
id	UUID	PRIMARY KEY	Inherited from BaseEntity
bill_account_id	UUID	NOT NULL, FK	Reference to bill account
billing_period_start	TIMESTAMP	NOT NULL	Billing period start date
billing_period_end	TIMESTAMP	NOT NULL	Billing period end date
issue_date	TIMESTAMP	NOT NULL	Bill issue date
due_date	TIMESTAMP	NOT NULL	Payment due date
currency	VARCHAR(3)	NOT NULL	Currency code (ISO 4217)
amount_due	DECIMAL(10,2)	NOT NULL	Amount due for payment
status	ENUM	NOT NULL, DEFAULT 'PENDING'	Bill processing status
extracted_jsonb	JSONB	NULL	Extracted bill data (flexible)
created_at	TIMESTAMP	NOT NULL	Inherited from BaseEntity
updated_at	TIMESTAMP	NOT NULL	Inherited from BaseEntity
deleted_at	TIMESTAMP	NULL	Inherited from BaseEntity
version	INTEGER	NOT NULL	Inherited from BaseEntity

Enums: - BillStatus: PENDING, FLAGGED, APPROVED, PAID

Relationships: - bill_account: ManyToOne → bill_account.id - documents: OneToMany → bill_document.bill_id - approval_events: OneToMany → approval_event.bill_id - payments: OneToMany → payment.bill_id

Business Rules: - Bills progress through status workflow - JSONB field allows flexible data extraction - Amount precision: 10 digits, 2 decimal places - Due date must be after issue date

bill_document - Bill Document Attachments

Purpose: Stores bill documents (PDFs, images) with metadata and processing status.

Column	Type	Constraints	Description
id	UUID	PRIMARY KEY	Inherited from BaseEntity
bill_id	UUID	NOT NULL, FK	Reference to bill
document_type	VARCHAR(50)	NOT NULL	Type of document
original_filename	VARCHAR(255)	NOT NULL	Original file name
file_size	INTEGER	NOT NULL	File size in bytes
mime_type	VARCHAR(100)	NOT NULL	MIME type
object_key	VARCHAR(500)	NOT NULL	Storage object key
processing_status	ENUM	NOT NULL, DEFAULT 'PENDING'	Processing status
extracted_text	TEXT	NULL	OCR extracted text
created_at	TIMESTAMP	NOT NULL	Inherited from BaseEntity
updated_at	TIMESTAMP	NOT NULL	Inherited from BaseEntity
deleted_at	TIMESTAMP	NULL	Inherited from BaseEntity
version	INTEGER	NOT NULL	Inherited from BaseEntity

Enums: - DocumentProcessingStatus: PENDING, PROCESSING, COMPLETED, FAILED

Relationships: - bill: ManyToOne → bill.id

Business Rules: - Documents are processed for text extraction - Object key references external storage (S3) - Supports multiple documents per bill

approval_event - Bill Approval Workflow

Purpose: Tracks approval/rejection events in the bill workflow.

Column	Type	Constraints	Description
id	UUID	PRIMARY KEY	Inherited from BaseEntity
bill_id	UUID	NOT NULL, FK	Reference to bill
user_id	UUID	NOT NULL, FK	User who performed action
action	ENUM	NOT NULL	Approval action taken
comment	TEXT	NULL	Optional comment
created_at	TIMESTAMPTZ	NOT NULL	Inherited from BaseEntity
updated_at	TIMESTAMPTZ	NOT NULL	Inherited from BaseEntity
deleted_at	TIMESTAMPTZ	NULL	Inherited from BaseEntity
version	INTEGER	NOT NULL	Inherited from BaseEntity

Enums: - ApprovalAction: APPROVED, REJECTED, FLAGGED, COMMENT_ADDED

Relationships: - bill: ManyToOne → bill.id - user: ManyToOne → user.id

Business Rules: - Immutable audit trail of approvals - Comments are optional
- Multiple events per bill allowed

Biller Management

bill_type - Biller Categories

Purpose: Categorizes billers by type (utility, telecom, etc.).

Column	Type	Constraints	Description
code	VARCHAR(50)	PRIMARY KEY	Biller type code
description	VARCHAR(255)	NOT NULL	Human-readable description

Relationships: - billers: OneToMany → biller.biller_type_code

Business Rules: - System-defined categories - No BaseEntity inheritance

biller - Bill Providers

Purpose: Companies/organizations that issue bills (utilities, telecoms, etc.).

Column	Type	Constraints	Description
id	UUID	PRIMARY KEY	Inherited from BaseEntity
name	VARCHAR(100)	NOT NULL	Biller company name

Column	Type	Constraints	Description
country_iso	VARCHAR(3)	NOT NULL	ISO country code
biller_type_code	VARCHAR	NOT NULL, FK	Reference to biller type
created_at	TIMESTAMP	NOT NULL	Inherited from BaseEntity
updated_at	TIMESTAMP	NOT NULL	Inherited from BaseEntity
deleted_at	TIMESTAMP	NULL	Inherited from BaseEntity
version	INTEGER	NOT NULL	Inherited from BaseEntity

Relationships: - biller_type: ManyToOne → biller_type.code - login_accounts: OneToMany → login_account.biller_id

Business Rules: - Global catalog of bill providers - Categorized by type and country

login_account - Biller Portal Credentials

Purpose: Stores credentials for accessing biller portals (for RPA/automation).

Column	Type	Constraints	Description
id	UUID	PRIMARY KEY	Inherited from BaseEntity
biller_id	UUID	NOT NULL, FK	Reference to biller
username	VARCHAR(255)	NOT NULL	Login username
encrypted_password	VARCHAR(500)	NOT NULL	Encrypted password
status	ENUM	NOT NULL, DEFAULT 'ACTIVE'	Account status
last_login_at	TIMESTAMP	NULL	Last successful login
created_at	TIMESTAMP	NOT NULL	Inherited from BaseEntity
updated_at	TIMESTAMP	NOT NULL	Inherited from BaseEntity
deleted_at	TIMESTAMP	NULL	Inherited from BaseEntity
version	INTEGER	NOT NULL	Inherited from BaseEntity

Enums: - LoginAccountStatus: ACTIVE, INACTIVE, LOCKED, EXPIRED

Relationships: - biller: ManyToOne → biller.id - bill_accounts: OneToMany → bill_account.login_account_id

Business Rules: - Passwords stored encrypted - Used by RPA for automated bill retrieval - Can have multiple accounts per biller

bill_account - Customer Bill Accounts

Purpose: Specific accounts that customers have with billers (account numbers).

Column	Type	Constraints	Description
id	UUID	PRIMARY KEY	Inherited from BaseEntity
account_no	VARCHAR(255)	NOT NULL	Account number with biller
account_name_on_bill	VARCHAR(255)	NULL	Name as appears on bill
login_account_id	UUID	NOT NULL, FK	Reference to login account
bill_address_id	UUID	NULL, FK	Billing address
status	ENUM	NOT NULL, DEFAULT 'ACTIVE'	Account status
created_at	TIMESTAMP	NOT NULL	Inherited from BaseEntity
updated_at	TIMESTAMP	NOT NULL	Inherited from BaseEntity
deleted_at	TIMESTAMP	NULL	Inherited from BaseEntity
version	INTEGER	NOT NULL	Inherited from BaseEntity

Enums: - BillAccountStatus: ACTIVE, INACTIVE, CLOSED

Relationships: - login_account: ManyToOne → login_account.id - bill_address: ManyToOne → address.id - company_links: OneToMany → bill_account_company.bill_account_id

Business Rules: - Represents customer's account with specific biller - Links to companies for access control - Can have dedicated billing address

bill_account_company - Bill Account Access Control

Purpose: Junction table linking bill accounts to companies (many-to-many).

Column	Type	Constraints	Description
id	UUID	PRIMARY KEY	Inherited from BaseEntity
bill_account_id	UUID	NOT NULL, FK	Reference to bill account
company_id	UUID	NOT NULL, FK	Reference to company

Column	Type	Constraints	Description
created_at	TIMESTAMPTZ	NOT NULL	Inherited from BaseEntity
updated_at	TIMESTAMPTZ	NOT NULL	Inherited from BaseEntity
deleted_at	TIMESTAMPTZ	NULL	Inherited from BaseEntity
version	INTEGER	NOT NULL	Inherited from BaseEntity

Relationships: - bill_account: ManyToOne → bill_account.id - company: ManyToOne → company.id

Business Rules: - Controls which companies can access bill accounts - Many-to-many relationship - Soft delete preserves history

Payment Processing

payment_method - Payment Methods

Purpose: Defines payment methods available to companies (bank accounts, cards, etc.).

Column	Type	Constraints	Description
id	UUID	PRIMARY KEY	Inherited from BaseEntity
company_id	UUID	NOT NULL, FK	Reference to company
method_type	ENUM	NOT NULL	Type of payment method
display_name	VARCHAR(255)	NOT NULL	Human-readable name
account_details	JSONB	NOT NULL	Encrypted account details
is_active	BOOLEAN	NOT NULL, DEFAULT TRUE	Active status
created_at	TIMESTAMPTZ	NOT NULL	Inherited from BaseEntity
updated_at	TIMESTAMPTZ	NOT NULL	Inherited from BaseEntity
deleted_at	TIMESTAMPTZ	NULL	Inherited from BaseEntity
version	INTEGER	NOT NULL	Inherited from BaseEntity

Enums: - PaymentMethodType: BANK_ACCOUNT, CREDIT_CARD, DIGITAL_WALLET

Relationships: - company: ManyToOne → company.id - payments: OneToMany → payment.payment_method_id

Business Rules: - Belongs to specific company - Account details stored encrypted in JSONB - Can be activated/deactivated

payment - Payment Transactions

Purpose: Records payment attempts and results for bills.

Column	Type	Constraints	Description
id	UUID	PRIMARY KEY	Inherited from BaseEntity
bill_id	UUID	NOT NULL, FK	Reference to bill
payment_method_id	UUID	NOT NULL, FK	Reference to payment method
amount	DECIMAL(10,2)	NOT NULL	Payment amount
attempted_at	TIMESTAMP	NOT NULL	Payment attempt timestamp
status	ENUM	NOT NULL	Payment status
reference_no	VARCHAR(255)	NOT NULL	Payment reference number
receipt_object_key	VARCHAR(255)	NOT NULL	Receipt storage key
created_at	TIMESTAMP	NOT NULL	Inherited from BaseEntity
updated_at	TIMESTAMP	NOT NULL	Inherited from BaseEntity
deleted_at	TIMESTAMP	NULL	Inherited from BaseEntity
version	INTEGER	NOT NULL	Inherited from BaseEntity

Enums: - PaymentStatus: ATTEMPTED, SUCCESS, FAILED

Relationships: - bill: ManyToOne → bill.id - payment_method: ManyToOne → payment_method.id

Business Rules: - Multiple payment attempts allowed per bill - Receipt stored in external storage - Amount precision: 10 digits, 2 decimal places

System & Utilities

address - Address Information

Purpose: Stores address information for companies and billing addresses.

Column	Type	Constraints	Description
id	UUID	PRIMARY KEY	Inherited from BaseEntity
address_line_1	VARCHAR(255)	NOT NULL	Primary address line
address_line_2	VARCHAR(255)	NULL	Secondary address line

Column	Type	Constraints	Description
city	VARCHAR(100)	NOT NULL	City name
state_province	VARCHAR(100)	NOT NULL	State or province
postal_code	VARCHAR(20)	NOT NULL	Postal/ZIP code
country_iso	VARCHAR(3)	NOT NULL	ISO country code
created_at	TIMESTAMPTZ	NOT NULL	Inherited from BaseEntity
updated_at	TIMESTAMPTZ	NOT NULL	Inherited from BaseEntity
deleted_at	TIMESTAMPTZ	NULL	Inherited from BaseEntity
version	INTEGER	NOT NULL	Inherited from BaseEntity

Business Rules: - Reusable address entities - ISO country codes for standard-ization

rpa_job - RPA Automation Jobs

Purpose: Tracks RPA jobs for automated bill retrieval and processing.

Column	Type	Constraints	Description
id	UUID	PRIMARY KEY	Inherited from BaseEntity
bill_account_id	UUID	NOT NULL, FK	Reference to bill account
job_type	ENUM	NOT NULL	Type of RPA job
status	ENUM	NOT NULL, DEFAULT 'QUEUED'	Job execution status
scheduled_at	TIMESTAMPTZ	NOT NULL	Scheduled execution time
started_at	TIMESTAMPTZ	NULL	Actual start time
completed_at	TIMESTAMPTZ	NULL	Completion time
result_data	JSONB	NULL	Job execution results
error_message	TEXT	NULL	Error details if failed
created_at	TIMESTAMPTZ	NOT NULL	Inherited from BaseEntity
updated_at	TIMESTAMPTZ	NOT NULL	Inherited from BaseEntity
deleted_at	TIMESTAMPTZ	NULL	Inherited from BaseEntity
version	INTEGER	NOT NULL	Inherited from BaseEntity

Enums: - RpaJobType: BILL_RETRIEVAL, PAYMENT_SUBMISSION - RpaJobStatus: QUEUED, RUNNING, COMPLETED, FAILED, CANCELLED

Relationships: - bill_account: ManyToOne → bill_account.id

Business Rules: - Automated job scheduling and execution - Result data stored in flexible JSONB format - Error handling and logging

tag_dictionary - Tag Definitions

Purpose: Defines available tags for categorizing resources within customers.

Column	Type	Constraints	Description
id	UUID	PRIMARY KEY	Inherited from BaseEntity
customer_id	UUID	NOT NULL, FK	Reference to customer
tag_name	VARCHAR(100)	NOT NULL	Tag name
description	VARCHAR(255)	NULL	Tag description
color	VARCHAR(7)	NULL	Display color (hex)
created_at	TIMESTAMPTZ	NOT NULL	Inherited from BaseEntity
updated_at	TIMESTAMPTZ	NOT NULL	Inherited from BaseEntity
deleted_at	TIMESTAMPTZ	NULL	Inherited from BaseEntity
version	INTEGER	NOT NULL	Inherited from BaseEntity

Relationships: - customer: ManyToOne → customer.id

Business Rules: - Customer-scoped tag definitions - Unique constraint on (customer_id, tag_name) - Optional color coding for UI

tag_applied - Applied Tags

Purpose: Junction table for applying tags to resources.

Column	Type	Constraints	Description
id	UUID	PRIMARY KEY	Inherited from BaseEntity
tag_id	UUID	NOT NULL, FK	Reference to tag dictionary
resource_type	VARCHAR(50)	NOT NULL	Type of tagged resource
resource_id	UUID	NOT NULL	ID of tagged resource
created_at	TIMESTAMPTZ	NOT NULL	Inherited from BaseEntity
updated_at	TIMESTAMPTZ	NOT NULL	Inherited from BaseEntity
deleted_at	TIMESTAMPTZ	NULL	Inherited from BaseEntity
version	INTEGER	NOT NULL	Inherited from BaseEntity

Relationships: - tag: ManyToOne → tag_dictionary.id

Business Rules: - Generic tagging system for any resource - Polymorphic associations via resource_type/resource_id - Unique constraint on (tag_id, resource_type, resource_id)

invitation - User Invitations

Purpose: Manages user invitation workflow for customer onboarding.

Column	Type	Constraints	Description
id	UUID	PRIMARY KEY	Inherited from BaseEntity
email	VARCHAR(255)	NOT NULL	Invitee email address
customer_id	UUID	NOT NULL, FK	Reference to customer
invited_by_user_id	UUID	NOT NULL, FK	User who sent invitation
token	VARCHAR(255)	NOT NULL, UNIQUE	Invitation token
expires_at	TIMESTAMP	NOT NULL	Token expiration
accepted_at	TIMESTAMP	NULL	Acceptance timestamp
status	ENUM	NOT NULL, DEFAULT 'PENDING'	Invitation status
created_at	TIMESTAMP	NOT NULL	Inherited from BaseEntity
updated_at	TIMESTAMP	NOT NULL	Inherited from BaseEntity
deleted_at	TIMESTAMP	NULL	Inherited from BaseEntity
version	INTEGER	NOT NULL	Inherited from BaseEntity

Enums: - InvitationStatus: PENDING, ACCEPTED, EXPIRED, CANCELLED

Relationships: - customer: ManyToOne → customer.id - invited_by: ManyToOne → user.id

Business Rules: - Time-limited invitation tokens - Email-based invitation workflow - Tracks invitation lifecycle

Entity Relationships

Primary Relationships Diagram

Customer (Tenant Root)
 Companies (1:N)
 Address (N:1)
 UserRoles (1:N)
 Users (N:1)
 Roles (N:1)
 Users (1:N)

```

TagDictionary (1:N)
Invitations (1:N)

BillerTypes (System)
  Billers (1:N)
    LoginAccounts (1:N)
      BillAccounts (1:N)
        BillAccountCompany (1:N) → Companies
        Address (N:1) [bill_address]
        Bills (1:N)
          BillDocuments (1:N)
          ApprovalEvents (1:N) → Users
          Payments (1:N)
            PaymentMethods (N:1) → Companies

Admins (System Global)

RpaJobs → BillAccounts

TagApplied → TagDictionary (polymorphic to any resource)

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Key Foreign Key Relationships

Child Table	Parent Table	FK Column	Cascade Rule
company	customer	customer_id	CASCADE DELETE
company	address	address_id	CASCADE INSERT/UPDATE
user	customer	customer_id	CASCADE DELETE
user_role	user	user_id	CASCADE DELETE
user_role	company	company_id	CASCADE DELETE
user_role	role	role_code	CASCADE DELETE
bill	bill_account	bill_account_id	RESTRICT
bill_document	bill	bill_id	CASCADE DELETE
approval_event	bill	bill_id	CASCADE DELETE
approval_event	user	user_id	RESTRICT
payment	bill	bill_id	RESTRICT
payment	payment_method	payment_method_id	RESTRICT
payment_method	company	company_id	CASCADE DELETE

Database Constraints

Unique Constraints

- customer.legal_entity_no - Global uniqueness
- company.reg_no - Global uniqueness
- user.email - Global uniqueness

- `admin.email` - Global uniqueness
- `invitation.token` - Global uniqueness
- `(tag_dictionary.customer_id, tag_dictionary.tag_name)` - Customer-scoped uniqueness
- `(tag_applied.tag_id, tag_applied.resource_type, tag_applied.resource_id)` - Unique tagging

Check Constraints

- Bill amounts must be positive
- Payment amounts must be positive
- Due dates must be after issue dates
- Billing period end must be after start

Indexes

- All foreign key columns automatically indexed
- Email columns for fast lookup
- Status columns for filtering
- Timestamp columns for date range queries

Data Types & Precision

- **UUIDs**: All primary keys for security and distribution
- **TIMESTAMPZ**: All timestamps with timezone support
- **DECIMAL(10,2)**: Monetary amounts with consistent precision
- **VARCHAR lengths**: Appropriate for data type (emails: 255, names: 100, etc.)
- **JSONB**: Flexible data storage with indexing support
- **ENUMs**: Type-safe status values

This schema provides a robust foundation for the multi-tenant bill automation platform with proper data isolation, audit trails, and business rule enforcement.