Margin System Schema Diagram

Entity Relationship Diagram

```
┌────────────────────────────────────────────────────────────────────────┐
│                          NEW MARGIN SYSTEM                             │
└────────────────────────────────────────────────────────────────────────┘

┌───────────────────┐
│    Contract       │
│===================│
│ + paymentModel    │ ◄─────────┐
│   (enum)          │           │
│                   │           │ Many-to-1
│ margins[]         │           │
└─────────┬─────────┘           │
          │                     │
          │ 1-to-Many           │
          ▼                     │
┌───────────────────┐           │
│     Margin        │           │
│===================│           │
│ id                │           │
│ invoiceId (UK)    │ ──────────┤
│ contractId        │ ──────────┘
│                   │
│ marginType        │ ◄──── enum: FIXED | VARIABLE | CUSTOM
│ marginPercentage  │
│ marginAmount      │
│ calculatedMargin  │
│                   │
│ isOverridden      │
│ overriddenBy      │ ───┐
│ overriddenAt      │    │
│ notes             │    │
│                   │    │
│ createdAt         │    │
│ updatedAt         │    │
└─────────┬─────────┘    │
          │              │
          │ 1-to-1       │
          ▼              │
┌───────────────────┐    │
│     Invoice       │    │
│===================│    │
│ senderId          │ ───┼──────┐
│ receiverId        │ ───┼──────┤
│                   │    │      │
│ paymentModel      │ ◄──┘      │ enum: GROSS | PAYROLL |
│   (enum)          │           │       PAYROLL_WE_PAY | SPLIT
│                   │           │
│ agencyMarkedPaidAt  │         │
│ agencyMarkedPaidBy  │ ────────┤
│ paymentReceivedAt   │         │
│ paymentReceivedBy   │ ────────┤
│                   │           │
│ margin (1-to-1)   │ ──────────┘
└───────────────────┘           │
                                │
                                │ Multiple Relations
                                ▼
                   ┌───────────────────┐
                   │       User        │
                   │===================│
                   │ invoicesSent[]    │
                   │ invoicesReceived[]│
                   │ invoicesAgencyMarkedPaid[]│
                   │ invoicesPaymentReceived[] │
                   │ marginsOverridden[]       │
                   └───────────────────┘
```

New Enums

PaymentModel

```
┌──────────────────┐
│  PaymentModel    │
├──────────────────┤
│ GROSS            │  - Client pays contractor + agency fee
│ PAYROLL          │  - Agency handles payroll
│ PAYROLL_WE_PAY   │  - Agency pays everything
│ SPLIT            │  - Split payment model
└──────────────────┘
```

MarginType

```
┌──────────────────┐
│   MarginType     │
├──────────────────┤
│ FIXED            │  - Fixed amount margin
│ VARIABLE         │  - Percentage-based margin
│ CUSTOM           │  - Custom calculation
└──────────────────┘
```

Data Flow: Invoice Creation with Margin

```
1. Contract Created
   ├─► paymentModel set (GROSS/PAYROLL/etc)
   └─► marginType set (from contract defaults)

2. Timesheet Approved
   └─► Invoice Auto-Generated
       ├─► senderId = contractor
       ├─► receiverId = client
       ├─► paymentModel = contract.paymentModel
       └─► Margin Record Created
           ├─► contractId = contract.id
           ├─► marginType = contract.marginType
           ├─► calculatedMargin = computed
           └─► isOverridden = false

3. Admin Review (optional)
   └─► Margin Override
       ├─► isOverridden = true
       ├─► overriddenBy = admin.id
       ├─► overriddenAt = now()
       ├─► notes = "reason for override"
       └─► calculatedMargin = new value

4. Payment Processing
   ├─► agencyMarkedPaidAt = when marked
   ├─► agencyMarkedPaidBy = who marked
   ├─► paymentReceivedAt = when received
   └─► paymentReceivedBy = who confirmed
```

Index Strategy

Margin Table Indexes

Index	Type	Purpose
invoiceId	UNIQUE	1-to-1 enforcement
contractId	INDEX	Contract margin queries
overriddenBy	INDEX	Audit trail lookups

Invoice Table New Indexes

Index	Type	Purpose
senderId	INDEX	User's sent invoices
receiverId	INDEX	User's received invoices
agencyMarkedPaidBy	INDEX	Payment tracking
paymentReceivedBy	INDEX	Receipt tracking

Key Relationships

Invoice ↔ Margin (1-to-1)

- Each Invoice can have exactly one Margin
- Margin is required for proper financial tracking
- Cascade delete: Margin deleted when Invoice deleted

Contract ↔ Margin (1-to-Many)

- Contract defines default margin settings
- Multiple Margins can reference same Contract
- Restrict delete: Prevent Contract deletion if Margins exist

User ↔ Invoice (Multiple Relations)

- **sender**: User who sends invoice (typically contractor)
- **receiver**: User who receives invoice (typically client)
- **agencyMarkedPaidBy**: Admin who marked invoice as paid
- **paymentReceivedBy**: Admin who confirmed payment receipt

User ↔ Margin (1-to-Many)

- **overriddenBy**: Admin who manually adjusted margin
- Tracks all margin overrides for audit purposes

Query Examples

Get Invoice with Margin Details

```
const invoice = await prisma.invoice.findUnique({
  where: { id: invoiceId },
  include: {
    margin: {
      include: {
        contract: true,
        overriddenByUser: true
      }
    },
    sender: true,
    receiver: true
  }
});
```

Get Contract with All Margins

```
const contract = await prisma.contract.findUnique({
  where: { id: contractId },
  include: {
    margins: {
      include: {
        invoice: true
      },
      orderBy: { createdAt: 'desc' }
    }
  }
});
```

Get User’s Payment Activities

```
const user = await prisma.user.findUnique({
  where: { id: userId },
  include: {
    invoicesSent: true,
    invoicesReceived: true,
    invoicesAgencyMarkedPaid: true,
    invoicesPaymentReceived: true,
    marginsOverridden: true
  }
});
```

Find Overridden Margins

```
const overriddenMargins = await prisma.margin.findMany({
  where: {
    isOverridden: true
  },
  include: {
    invoice: true,
    contract: true,
    overriddenByUser: true
  },
  orderBy: { overriddenAt: 'desc' }
});
```

Migration Impact

✅ Additive Changes Only

- No existing data modified
- No columns removed
- All new fields are optional
- Backward compatible

🔄 Required Updates

1. Invoice creation logic → Create Margin record
2. Payment tracking → Use new agency payment fields
3. Reports → Query Margin table for financial data

4. Admin UI → Add margin override functionality

📊 Performance Considerations

- Indexes on all foreign keys
- Efficient 1-to-1 lookup via unique constraint
- Optimized for audit queries (overriddenBy index)
- No impact on existing queries