Phase 1: Database Schema Changes - COMPLETED ✅

Summary

Successfully implemented comprehensive database schema changes for the Margin System and Invoice enhancements in the payroll SaaS application.

What Was Done

✅ 1. Created New Enums

- **PaymentModel**: `GROSS`, `PAYROLL`, `PAYROLL_WE_PAY`, `SPLIT`
- **MarginType**: `FIXED`, `VARIABLE`, `CUSTOM`

✅ 2. Created Margin Table

A dedicated table with the following features:
- Unique 1-to-1 relationship with Invoice
- Many-to-1 relationship with Contract
- Support for percentage and fixed amount margins
- Override tracking (who, when, notes)
- Complete audit trail with timestamps
- Optimized indexes for performance

Key Fields:
- `marginType` (enum)
- `marginPercentage` (optional)
- `marginAmount` (optional)
- `calculatedMargin` (required)
- `isOverridden`, `overriddenBy`, `overriddenAt`
- `notes` for administrative context

✅ 3. Updated Invoice Model

Enhanced with:
- **Sender/Receiver**: Clear user references for invoice parties
- **Payment Model**: Enum field copied from contract
- **Agency Payment Tracking**:
- `agencyMarkedPaidAt` / `agencyMarkedPaidBy`
- `paymentReceivedAt` / `paymentReceivedBy`
- **Margin Relation**: 1-to-1 optional relation to Margin table

✅ 4. Updated Contract Model

- Added `paymentModel` field (PaymentModel enum)
- Added `margins[]` relation (1-to-many with Margin)

✅ 5. Updated User Model

New relations for complete tracking:
- `invoicesSent[]`
- `invoicesReceived[]`
- `invoicesAgencyMarkedPaid[]`
- `invoicesPaymentReceived[]`
- `marginsOverridden[]`

✅ 6. Added Performance Indexes

Strategic indexes on:
- Margin: `invoiceId` , `contractId` , `overriddenBy`
- Invoice: `senderId` , `receiverId` , `agencyMarkedPaidBy` , `paymentReceivedBy`

✅ 7. Schema Validation & Client Generation

- Schema validated successfully ✅
- Prisma Client regenerated ✅
- All relations properly configured ✅

File Changes

- **Modified**: `prisma/schema.prisma`
- Added 2 new enums (lines 910-921)
- Added Margin model (lines 714-743)
- Updated Invoice model (lines 620-717)
- Updated Contract model (lines 409-518)
- Updated User model (lines 229-340)

- **Created**: `prisma/migrations-docs/add-margin-system-and-invoice-updates.md`

- Comprehensive migration documentation
- Expected SQL for migration
- Rollback procedures
- Testing recommendations

Migration Status

⚠️ Migration Not Yet Applied to Database

The schema changes are complete and validated, but need to be applied to a live database. Since no database connection was available during development, the migration files haven't been generated yet.

To Apply Migration:

When you have database access, run:

```
# Option 1: Create and apply migration (recommended)
npx prisma migrate dev --name add-margin-system-and-invoice-updates

# Option 2: Push schema without migration history (dev only)
npx prisma db push
```

See `prisma/migrations-docs/add-margin-system-and-invoice-updates.md` for detailed instructions.

Breaking Changes

✅ **NONE** - This is a fully additive migration:
- All new fields are optional
- No existing columns modified or removed
- No data migration required
- Backward compatible with existing code

Next Steps

Immediate (Required for Production):

1. **Apply Migration**: Run migration against your database
2. **Verify Schema**: Use Prisma Studio to verify tables
3. **Test Queries**: Validate indexes are working

Phase 2 (Application Layer):

1. Update API endpoints to use new Margin table
2. Implement margin calculation service integration
3. Update invoice creation workflow
4. Add sender/receiver assignment logic
5. Implement agency payment tracking UI/API
6. Add margin override functionality for admins

Phase 3 (Business Logic):

1. Migrate existing inline margin calculations to Margin table
2. Update reports to use new margin structure
3. Implement margin approval workflows
4. Add audit logging for margin overrides

Validation Checklist

Before merging to main:
- [x] Schema validates successfully
- [x] Prisma Client generates without errors
- [x] All relations properly defined
- [x] Indexes added for performance
- [x] Migration documentation created
- [ ] Migration applied to database
- [ ] Manual testing in Prisma Studio

- [ ] Integration tests updated
- [ ] API endpoints updated

Technical Details

- **Prisma Version**: 6.7.0
- **Database**: PostgreSQL
- **Branch**: expenses-structure
- **Date**: December 10, 2024

Support

For questions or issues with this migration, refer to:
- Detailed docs: `prisma/migrations-docs/add-margin-system-and-invoice-updates.md`
- Schema file: `prisma/schema.prisma`
- Rollback procedures: See migration docs

Status: ✅ Schema changes complete and validated. Ready for database migration.