## 📅 \*\*Phase 4: Advanced Features & Integration (Weeks 12-14)\*\*

### \*\*Week 12: Advanced Payment Flows\*\* (Feb 24 - Mar 2, 2025)

\*\*Day 78 - Mon, Feb 24\*\* (4h dev + 1h learning)

- \*\*Learning\*\*: Partial payment processing patterns

- \*\*Development\*\*:

- [ ] Implement `POST /api/payments/partial` endpoint

- [ ] Add partial payment validation

- [ ] Create partial payment tracking

- [ ] Implement remaining balance management

- \*\*Success Check\*\*: Partial payments can be processed and tracked

\*\*Day 79 - Tue, Feb 25\*\* (4h dev + 1h learning)

- \*\*Learning\*\*: Scheduled payment systems

- \*\*Development\*\*:

- [ ] Implement `POST /api/payments/scheduled` endpoint

- [ ] Add payment scheduling engine

- [ ] Create scheduled payment queue

- [ ] Implement schedule validation and conflicts

- \*\*Success Check\*\*: Payments can be scheduled for future processing

\*\*Day 80 - Wed, Feb 26\*\* (4h dev + 1h learning)

- \*\*Learning\*\*: Recurring payment/subscription models

- \*\*Development\*\*:

- [ ] Implement `POST /api/payments/subscriptions` endpoint

- [ ] Add subscription plan management

- [ ] Create recurring payment processor

- [ ] Implement subscription lifecycle management

- \*\*Success Check\*\*: Recurring subscriptions with automated billing

\*\*Day 81 - Thu, Feb 27\*\* (4h dev + 1h learning)

- \*\*Learning\*\*: Payment retry mechanisms and strategies

- \*\*Development\*\*:

- [ ] Implement `PUT /api/payments/{id}/retry` endpoint

- [ ] Add smart retry logic (exponential backoff)

- [ ] Create retry limit management

- [ ] Implement retry analytics and reporting

- \*\*Success Check\*\*: Automated payment retry system operational

\*\*Day 82 - Fri, Feb 28\*\* (4h dev + 1h learning)

- \*\*Learning\*\*: Bulk payment processing

- \*\*Development\*\*:

- [ ] Implement `POST /api/payments/bulk` endpoint

- [ ] Add bulk payment validation

- [ ] Create bulk payment status tracking

- [ ] Implement bulk payment rollback

- \*\*Success Check\*\*: High-volume bulk payments processed efficiently

\*\*Day 83 - Sat, Mar 1\*\* (4h dev)

- \*\*Development\*\*:

- [ ] Add payment flow analytics

- [ ] Implement payment success rate optimization

- [ ] Create payment flow A/B testing

- [ ] Add payment flow performance monitoring

- \*\*Success Check\*\*: Data-driven payment flow optimization

\*\*Day 84 - Sun, Mar 2\*\* (4h dev)

- \*\*Weekly Review & Polish\*\*:

- [ ] End-to-end advanced payment flow testing

- [ ] Load test bulk payment processing

- [ ] Implement payment flow circuit breakers

- [ ] Document advanced payment APIs

- \*\*Week 12 Deliverable\*\*: ✅ Advanced payment flows with subscriptions and bulk processing

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### \*\*Week 13: Fraud Detection & Security\*\* (Mar 3 - Mar 9, 2025)

\*\*Day 85 - Mon, Mar 3\*\* (4h dev + 1h learning)

- \*\*Learning\*\*: Fraud detection algorithms and patterns

- \*\*Development\*\*:

- [ ] Implement `POST /api/security/fraud-check` endpoint

- [ ] Add transaction scoring engine

- [ ] Create basic fraud rules (velocity, amount, location)

- [ ] Implement fraud score calculation

- \*\*Success Check\*\*: Basic fraud detection scoring operational

\*\*Day 86 - Tue, Mar 4\*\* (4h dev + 1h learning)

- \*\*Learning\*\*: Real-time transaction monitoring

- \*\*Development\*\*:

- [ ] Implement real-time transaction analysis

- [ ] Add behavioral pattern detection

- [ ] Create device fingerprinting

- [ ] Implement IP reputation checking

- \*\*Success Check\*\*: Real-time fraud monitoring active

\*\*Day 87 - Wed, Mar 5\*\* (4h dev + 1h learning)

- \*\*Learning\*\*: Security event logging and analysis

- \*\*Development\*\*:

- [ ] Implement `GET /api/security/events` endpoint

- [ ] Add comprehensive security event tracking

- [ ] Create security incident management

- [ ] Implement security event correlation

- \*\*Success Check\*\*: Complete security event monitoring

\*\*Day 88 - Thu, Mar 6\*\* (4h dev + 1h learning)

- \*\*Learning\*\*: Rate limiting and API security

- \*\*Development\*\*:

- [ ] Implement `PUT /api/security/rules` endpoint

- [ ] Add dynamic rate limiting configuration

- [ ] Create API abuse detection

- [ ] Implement security rule engine

- \*\*Success Check\*\*: Adaptive rate limiting and API protection

\*\*Day 89 - Fri, Mar 7\*\* (4h dev + 1h learning)

- \*\*Learning\*\*: Machine learning for fraud detection

- \*\*Development\*\*:

- [ ] Implement ML model integration for fraud detection

- [ ] Add anomaly detection algorithms

- [ ] Create fraud pattern learning

- [ ] Implement model performance monitoring

- \*\*Success Check\*\*: ML-enhanced fraud detection operational

\*\*Day 90 - Sat, Mar 8\*\* (4h dev)

- \*\*Development\*\*:

- [ ] Add fraud case management

- [ ] Implement manual review workflow

- [ ] Create fraud reporting and analytics

- [ ] Add fraud prevention recommendations

- \*\*Success Check\*\*: Complete fraud management system

\*\*Day 91 - Sun, Mar 9\*\* (4h dev)

- \*\*Weekly Review & Polish\*\*:

- [ ] Test fraud detection accuracy

- [ ] Implement fraud system performance optimization

- [ ] Security audit of fraud detection system

- [ ] Document fraud detection APIs and rules

- \*\*Week 13 Deliverable\*\*: ✅ Comprehensive fraud detection and security system

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### \*\*Week 14: Notification Service & Webhooks\*\* (Mar 10 - Mar 16, 2025)

\*\*Day 92 - Mon, Mar 10\*\* (4h dev + 1h learning)

- \*\*Learning\*\*: Event-driven notification systems

- \*\*Development\*\*:

- [ ] Implement `POST /api/notifications/send` endpoint

- [ ] Add email notification service (SMTP integration)

- [ ] Create SMS notification service (simulated)

- [ ] Implement push notification framework

- \*\*Success Check\*\*: Multi-channel notification system operational

\*\*Day 93 - Tue, Mar 11\*\* (4h dev + 1h learning)

- \*\*Learning\*\*: Notification template management

- \*\*Development\*\*:

- [ ] Implement `GET /api/notifications/templates` endpoint

- [ ] Add dynamic template system

- [ ] Create template versioning

- [ ] Implement template localization

- \*\*Success Check\*\*: Flexible notification templating system

\*\*Day 94 - Wed, Mar 12\*\* (4h dev + 1h learning)

- \*\*Learning\*\*: Webhook management best practices

- \*\*Development\*\*:

- [ ] Implement `POST /api/webhooks/subscribe` endpoint

- [ ] Add webhook subscription management

- [ ] Create webhook delivery guarantees

- [ ] Implement webhook security (signatures)

- \*\*Success Check\*\*: Reliable webhook subscription system

\*\*Day 95 - Thu, Mar 13\*\* (4h dev + 1h learning)

- \*\*Learning\*\*: Event publishing patterns

- \*\*Development\*\*:

- [ ] Implement `GET /api/webhooks/events` endpoint

- [ ] Add event catalog management

- [ ] Create event schema validation

- [ ] Implement event versioning

- \*\*Success Check\*\*: Comprehensive event publishing system

\*\*Day 96 - Fri, Mar 14\*\* (4h dev + 1h learning)

- \*\*Learning\*\*: Delivery status tracking and analytics

- \*\*Development\*\*:

- [ ] Implement notification delivery tracking

- [ ] Add delivery analytics and reporting

- [ ] Create notification performance monitoring

- [ ] Implement delivery optimization

- \*\*Success Check\*\*: Complete notification analytics system

\*\*Day 97 - Sat, Mar 15\*\* (4h dev)

- \*\*Development\*\*:

- [ ] Add notification preference management

- [ ] Implement do-not-disturb settings

- [ ] Create notification A/B testing

- [ ] Add notification feedback collection

- \*\*Success Check\*\*: User-centric notification management

\*\*Day 98 - Sun, Mar 16\*\* (4h dev)

- \*\*Weekly Review & Polish\*\*:

- [ ] End-to-end notification flow testing

- [ ] Load test notification system

- [ ] Implement notification circuit breakers

- [ ] Document notification and webhook APIs

- \*\*Week 14 Deliverable\*\*: ✅ Robust notification service with webhooks

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## 🎯 \*\*End of Phase 4 Review\*\* (Mar 17, 2025)

\*\*Status Check\*\*:

- [ ] Advanced payment flows (partial, scheduled, recurring, bulk)

- [ ] Comprehensive fraud detection system

- [ ] Multi-channel notification service

- [ ] Webhook management system

- [ ] All advanced features integrated and tested

\*\*Phase 4 Complete!\*\* ✅ Advanced features and security implemented!