ANDALLO

PRODUCT REQUIREMENTS DOCUMENT

Photography Marketplace, Revenue, Community & Engagement Platform

Enterprise PRD v2.0

Baseline data: Agustus – 7 Oktober 2026 • Source: Andallo sales / PRD dataset

Vision
Menjadi platform layanan fotografi yang menggabungkan transaksi, komunikasi, komunitas, hiburan, dukungan pelanggan, dan insight bisnis dalam satu ekosistem digital.

Baseline KPI	Nilai	Catatan
Transaksi	118	Data simulasi / proyeksi
GMV	Rp91,29 juta	Agustus–7 Oktober 2026
Platform Revenue	Rp41,99 juta	Admin + subscription + promotion
Net Profit	Rp27,47 juta	Mengikuti struktur P&L; sumber
Completed / Refund	115 / 3	Refund total sekitar Rp69,7 ribu

Catatan data: workbook sumber menyatakan data sebagai SIMULASI / PROYEKSI. Angka digunakan sebagai baseline desain dan contoh KPI; sebelum go-live wajib direkonsiliasi dengan data produksi.

1. Executive Summary

- Andallo adalah marketplace jasa fotografi dengan tiga mesin nilai: **transaction engine**, **provider monetization**, dan **engagement/community engine**.
- PRD ini memperluas produk dari booking & revenue menjadi ekosistem: **WhatsApp, game/hiburan, complaint center, curhat, dan personalization**.
- Semua transaksi finansial tetap melalui API → business logic → service → data access → database; UI tidak boleh menulis langsung ke database.
- Dashboard management menggunakan konsep **holographic control tower**: KPI cards, trend surfaces, live activity, drill-down, alerts, dan configurable widgets.
- Fitur komunitas/curhat harus privacy-first: consent, kontrol visibilitas, moderation, reporting, retention policy, dan escalation untuk kondisi berisiko.

Pilar Produk	Outcome
Marketplace	Discovery → availability → booking → payment → fulfillment → review
Revenue	Admin fee, subscription, promotion, brand campaign, financial ledger
Communication	In-app messaging + WhatsApp notification / support
Support	Complaint ticket, SLA, escalation, resolution audit
Community	Curhat, topic room, reactions, moderation
Entertainment	Mini-games, challenges, rewards, engagement loops
Personalization	Theme, layout, widgets, density, language, notification preferences
Management	Holographic dashboard + governed metrics + alerts

2. Problem Statement & Opportunity

- Data sales, subscription, promotion, customer, marketing, P&L;, provider, dan daily metrics tersebar sehingga reconciliation dan decision-making lambat.
- Booking, provider workflow, communication, dan support belum berada dalam satu operating model.
- User membutuhkan lebih dari transaksi: mereka membutuhkan reassurance, support, komunikasi cepat, dan engagement setelah booking.
- Provider membutuhkan visibility atas earnings, bookings, promotion, subscription, dan customer communication.
- Management membutuhkan satu control tower yang dapat menjawab: apa yang terjadi, mengapa terjadi, dan tindakan apa yang harus dilakukan.

Problem	Impact	Product Response
Revenue data fragmented	Reconciliation risk	Unified transaction + ledger
Provider workflow disconnected	Manual follow-up	Provider workspace + SLA
Communication fragmented	Slow response	WhatsApp + in-app notification
Customer complaints manual	Low trust	Ticketing + escalation
Engagement drops after transaction	Low retention	Game + content + rewards
Dashboard static	Late decisions	Holographic control tower

3. Goals, Non-Goals & Success Metrics

Goals

- Meningkatkan booking conversion, payment success, completion, repeat booking, dan provider productivity.
- Menyatukan revenue streams dan memastikan setiap financial event idempotent serta auditable.
- Membuat WhatsApp sebagai communication channel terkontrol, bukan bypass terhadap business rules.
- Menjadikan complaint & support measurable melalui SLA, resolution time, CSAT, dan escalation.
- Membangun engagement loop melalui game/hiburan tanpa mengganggu core booking experience.
- Memberi user kontrol atas tampilan dashboard melalui customization yang aman dan reversible.

Guardrail KPI baseline

Metric	Baseline	Target/Guardrail
Booking conversion	3,39% Aug; 3,19% Sep; 2,35% Oct partial	Trend naik; October normalized
GMV	Rp91,29 jt	Reconciled daily
Platform revenue	Rp41,99 jt	Reconciled to ledger
Payment success	Not established in source	≥97% target
Completed	115 / 118	≥97% target
Refund	3 transactions	Monitor rate + reason
AOV	Rp615k → Rp635k → Rp690k	Monitor quality of mix

Non-goals MVP: full general-ledger accounting, payroll photographer, marketplace kategori non-fotografi, complex AI photo editing, multi-currency settlement.

4. Personas & Roles

Role	Primary Need	Core Permissions
Customer	Find, book, pay, communicate, get support, engage	Browse, book, pay, message, complaint, curhat, play
Photographer / Provider	Manage supply, earnings, availability	Profile, package, calendar, accept/reject, chat, subscription
Ops / Support	Resolve issues quickly	Ticket, refund workflow, controlled override, escalation
Marketing	Campaign + attribution + engagement	Promo, campaign, game challenge, analytics
Finance	Reconciliation + profitability	Ledger, settlement, refund, export, P&L;
Community Moderator	Safe community experience	Moderate, report, hide, escalate, audit
Admin / Management	Governance + KPI	Read-all + controlled configuration

5. Core User Journeys

Customer booking journey

- Discover city/category → compare provider → package & availability → booking draft → promo → payment → provider acceptance → service → completion → review → repeat/referral.

Communication journey

- Booking event → in-app notification → optional WhatsApp notification → user replies through supported channel → message routed to conversation/ticket → audit trail.

Complaint journey

- Create complaint → classify → SLA timer → assign agent → evidence → action/refund if approved → resolution → CSAT → close/reopen.

Curhat journey

- Choose private/anonymous mode → topic → write/share → moderation pre-check → publish or private journal → reactions/replies if enabled → report/escalate → retention rules.

Entertainment journey

- Daily check-in → mini-game → challenge → points → non-cash reward / badge → streak → personalized recommendation.

6. Functional Scope

Module	MVP Capability	Priority
Identity & Access	Login, OTP/email, RBAC, consent, sessions	P0
Marketplace	Search, filter, provider, package, availability	P0
Booking	Draft, reserve, payment, state machine	P0
Revenue	Admin fee, subscription, promotion, ledger, reconciliation	P0
Provider	Onboarding, profile, packages, calendar, earnings	P0
Notification	Email, push, WhatsApp abstraction	P1
Complaint Center	Ticket, SLA, evidence, escalation, CSAT	P0/P1
Curhat / Community	Private/anonymous post, moderation, reporting	P1
Game / Entertainment	Mini-games, challenges, points, badges	P1
Personalization	Theme, layout, widgets, density, notifications	P1
Analytics	Funnel, attribution, cohorts, engagement	P1
Management Dashboard	Sales, revenue, customer, provider, support, engagement, P&L;	P0
Admin / Audit	Moderation, configuration, audit, manual adjustment	P0

7. New Feature — WhatsApp

- **Transactional:** booking confirmation, payment status, provider acceptance, reminder, completion, refund status.
- **Support:** user can enter support flow from WhatsApp and receive a ticket reference.
- **Provider:** booking alert and selected operational messages.
- **Opt-in:** explicit consent, template governance, opt-out, frequency controls.
- **Security:** never send payment secrets, OTP in unsafe contexts, full card data, or sensitive curhat content through WhatsApp by default.
- **Architecture:** WhatsApp adapter isolated in Service Layer; webhook verification + idempotency + retry + dead-letter queue.

API	Purpose
POST /whatsapp/opt-in	Record channel consent
POST /whatsapp/messages	Send approved template/message
POST /webhooks/whatsapp	Receive and verify webhook
GET /conversations/{id}	Conversation state
POST /support/tickets	Create/attach support ticket

8. New Feature — Complaint Center

- Ticket categories: payment, booking, provider, service quality, refund, account, technical, other.
- Priority: Low / Normal / High / Critical. SLA timers are policy-configurable.
- Evidence: booking reference, text, attachments, timestamps, selected message excerpts.
- Workflow: OPEN → TRIAGED → ASSIGNED → IN_PROGRESS → WAITING_USER/PROVIDER → RESOLVED → CLOSED; REOPENED branch allowed.
- Refund/financial actions are separate privileged operations and always create ledger + audit events.
- Dashboard metrics: ticket volume, first response time, resolution time, SLA breach, reopen rate, CSAT, category Pareto.

9. New Feature — Curhat / Safe Community

- Mode: private journal, anonymous community, or identified community; default privacy should be the safest option.
- Topic taxonomy: daily life, work, relationship, photography, confidence, stress, other.
- Controls: comments on/off, reaction on/off, hide, block, report, delete, retention.
- Moderation: automated signal detection + human moderation queue; no automated system should be the sole basis for punitive action.
- Safety: content that indicates imminent danger or self-harm risk is escalated according to a defined safety protocol; the product must clearly state that this is not a replacement for professional emergency or mental-health services.
- Data minimization: do not expose curhat content in management dashboards except aggregated safety/moderation metrics.

Object	Key Fields
CurhatPost	id, author_mode, user_id(optional), topic, body, visibility, status, created_at
CurhatComment	id, post_id, author_mode, body, status
CommunityReport	id, target_type, target_id, reason, reporter_id, status
ModerationAction	id, actor_id, action, reason, before/after, timestamp

10. New Feature — Game / Hiburan

- Game harus menjadi engagement layer, bukan gambling. Tidak ada taruhan uang atau mekanisme cash-out berbasis keberuntungan.
- Contoh: photo quiz, spot-the-detail, daily trivia, caption challenge, photography knowledge, streak, achievement.
- Reward: badge, points, discount entitlement yang dibatasi policy, early-access content, provider promo exposure.
- Anti-abuse: daily caps, rate limit, device/session signals, anomaly detection, reward ledger.
- Gamification events masuk analytics: game_start, game_complete, challenge_joined, reward_earned, reward_redeemed.

Component	Requirement
Game Catalog	Versioned game definitions and active period
Challenge	Rules, eligibility, start/end, max participation
Point Ledger	Immutable earn/spend events
Badge	Criteria + progress
Reward	Non-cash entitlement with expiry/limits
Leaderboard	Optional; privacy-aware and opt-in

11. Personalization & Display Settings

- **Theme:** Holographic / Minimal / High Contrast / Dark / Light.
- **Dashboard layout:** drag-and-drop widgets, resize, pin, hide, restore default.
- **Density:** Compact / Comfortable / Spacious.
- **Data display:** IDR format, percentage, chart type, refresh interval.
- **Notification:** channel and frequency per event category.
- **Accessibility:** reduced motion, high contrast, keyboard navigation, text scaling.
- **Role-aware defaults:** Management sees KPI/finance; Ops sees ticket/SLA; Provider sees bookings/earnings; Customer sees bookings/recommendations.
- **Configuration:** preferences stored separately from business-critical configuration; reset-to-default always available.

API	Purpose
GET /me/preferences	Read preferences
PUT /me/preferences	Update preferences
GET /dashboard/layout	Read widget layout
PUT /dashboard/layout	Persist layout
POST /dashboard/layout/reset	Restore default

12. Holographic Dashboard — UX Specification

Dashboard concept: **Holographic Control Tower**. Visual language uses layered glass panels, subtle glow, depth, translucent surfaces, animated data lines, and high information density without sacrificing readability.

Zone	Widget	Interaction
Top KPI Rail	GMV, Bookings, Revenue, Net Profit, AOV	Period selector + drill-down
Revenue Core	Admin, Subscription, Promotion, Brand Campaign	Stream filter
Sales Pulse	Bookings & GMV trend	Hover / date range
Funnel	Visitors → Leads → Booking → Paid → Completed	Stage drill-down
Provider Matrix	Active, booking, GMV, rating, plan	City/provider filters
Customer Pulse	New/repeat, conversion, CAC	Source/campaign filters
Support Radar	Open tickets, SLA breach, CSAT	Category/priority
Community Pulse	Curhat volume, reports, moderation queue	Privacy-safe aggregate only
Engagement	Game sessions, challenges, rewards	Cohort/date
Live Activity	Bookings, payments, refunds, alerts	Real-time feed
Finance	Payment fee, refunds, marketing, operational cost, profit	P&L; drill-down

Visual rules: avoid decorative 3D that reduces legibility; motion is functional, not ornamental; critical alerts use explicit icons/labels; users can switch to reduced-motion/high-contrast mode.

13. Seven-Layer Target Architecture

Layer	Responsibility	Core Components
1. Presentation / UI	Interaction, state, personalization	Customer Web, Provider Portal, Admin Console, Holographic Dashboard
2. API	Contracts, auth, validation, versioning	REST/JSON, OpenAPI, RBAC, rate limit
3. Business Logic	Rules, workflows, state transitions	Booking, pricing, promo, complaint, curhat moderation policy, rewards
4. Service	External/integration capabilities	Payment, WhatsApp, notification, media, search, analytics, moderation adapters
5. Data Access	Persistence abstraction	Repositories, query services, unit-of-work
6. Database	Durable source of truth	PostgreSQL, Redis, object storage, analytics warehouse
7. Infrastructure	Runtime, security, scale, observability	Cloud, containers, queue, CDN, WAF, secrets, monitoring, backup

Core principle: UI → API → Business Logic → Service/Data Access → Database. External systems are isolated through service adapters. Analytics/search can be eventually consistent; booking/payment/ledger require strong consistency.

14. Layer 1 — Presentation / UI

- Customer Web/App: Home, search, provider detail, checkout, booking, chat, complaint, curhat, game, profile, settings.
- Provider Portal: dashboard, booking queue, calendar, package, earnings, subscription, promotion, communication.
- Admin Console: KPI, transactions, provider, customer, complaint, moderation, promotion, P&L;, audit, configuration.
- Holographic Dashboard: responsive control tower with role-specific widgets.
- UI states required: loading, empty, error, partial data, permission denied, offline/retry where applicable.
- Financial actions require explicit confirmation; optimistic UI is not allowed for irreversible financial mutations.

15. Layer 2 — API Layer

- Base path: /api/v1. JSON payloads. ISO-8601 timestamps. IDR stored as integer.
- Authentication: secure session/JWT strategy with server-side authorization and RBAC.
- Idempotency-Key required for booking confirmation, payment, refund, subscription purchase, reward redemption, and other financial/entitlement mutations.
- Cursor pagination for high-volume resources; deterministic sorting.
- Webhooks require signature verification, timestamp tolerance, event versioning, idempotency, and retry handling.
- Errors use stable machine-readable codes and field-level details; never return stack traces.

Method	Endpoint	Purpose
POST	/auth/login	Authenticate
GET	/providers	Search providers
GET	/providers/{id}/availability	Availability
POST	/bookings	Create draft
POST	/bookings/{id}/confirm	Reserve + confirm
POST	/payments/intents	Create payment intent
POST	/payments/webhooks/{provider}	Payment webhook
POST	/bookings/{id}/refunds	Refund request
POST	/subscriptions	Subscription
POST	/promotions	Promotion
POST	/support/tickets	Complaint ticket
POST	/curhat/posts	Curhat post
POST	/games/{id}/play	Game session
GET	/dashboard/kpis	Governed KPI
GET	/reports/pnl	P&L;

16. Layer 3 — Business Logic

Domain	Business Rule
Booking	Atomic slot reservation; no double booking; controlled state machine
Pricing	Immutable price snapshot at booking
Admin Fee	Baseline 10% × Net Booking; effective-dated configuration
Payment	Gateway fee separate from platform fee; idempotent webhook
Refund	Cannot exceed paid amount; reversal event, never delete history
Subscription	Entitlement follows active plan; grace + suspension
Promotion	Eligibility, budget, period, placement, abuse controls
Complaint	SLA timer, assignment, escalation, resolution state machine
Curhat	Visibility, consent, moderation, reporting, retention
Game	Eligibility, attempt caps, reward rules, anti-abuse
Personalization	Preference-only changes; business configuration protected

Recommended pattern: domain services + command handlers; immutable financial events; effective_from/effective_to configuration; all privileged overrides audited.

17. Layer 4 — Service Layer

Service	Responsibility	Failure Strategy
PaymentService	Intent, status, refund, gateway adapter	Retry + idempotency + DLQ
WhatsAppService	Templates, send, webhook, consent	Retry + rate limit + audit
NotificationService	Email/SMS/WhatsApp/push	Async queue + retry
MediaService	Portfolio, complaint evidence, curhat attachments	Object storage + async processing
SearchService	Provider/package discovery	Index rebuild from DB events
AnalyticsService	Funnel, attribution, cohorts	Queue; eventual consistency
SubscriptionService	Billing + entitlement	Scheduler + payment events
PromotionService	Campaign/listing rules	Budget/expiry validation
ComplaintService	Ticket routing + SLA	Escalation queue
ModerationService	Community safety workflows	Human review queue
GameService	Sessions, challenge, points	Reward ledger + anti-abuse
ReconciliationService	Gateway vs internal ledger	Daily job + exception report

18. Layer 5 — Data Access Layer

Data Access Layer mengisolasi SQL/ORM dari domain logic, menetapkan transaction boundary, dan menyediakan read model yang dapat dioptimalkan tanpa mengubah business rules.

Repository / Query	Core Methods
UserRepository	findById, findByEmail, updateRole, disable
ProviderRepository	findSearchable, findById, updateProfile, updateStatus
BookingRepository	create, getById, listByCustomer, listByProvider, transitionStatus
PaymentRepository	createIntent, getByReference, recordWebhook, markRefunded
LedgerRepository	appendEvent, listByTransaction, aggregateRevenue
SubscriptionRepository	create, renew, suspend, getEntitlement
PromotionRepository	create, activate, expire, listEligible
ComplaintRepository	create, assign, transition, listSLA
CurhatRepository	create, listVisible, report, moderate
GameRepository	startSession, recordAttempt, appendReward
AnalyticsQuery	funnel, cohort, attribution, KPI aggregates

19. Layer 6 — Database Layer

Primary database: PostgreSQL. Redis untuk cache/lock/rate-limit. Object storage untuk portfolio/evidence. Analytics warehouse ditambahkan ketika event volume dan BI workload meningkat.

Table	Core Fields
users	id, role, name, email/phone, status, created_at
providers	id, user_id, brand_name, city, rating, status, approved_at
provider_packages	id, provider_id, service_type, name, price, duration, active
availability_slots	id, provider_id, start_at, end_at, status
bookings	id, customer_id, provider_id, package_id, gross, discount, net, fee, payable, status
payments	id, booking_id, gateway, external_ref, amount, status
refunds	id, booking_id, amount, reason, status
ledger_events	id, entity_type, entity_id, event_type, amount, occurred_at
subscriptions	id, provider_id, plan, price, status, period
promotions	id, provider_id/brand_id, type, budget, start_at, end_at, status
support_tickets	id, requester_id, booking_id, category, priority, status, sla_due_at
curhat_posts	id, user_id/null, author_mode, topic, body, visibility, status
community_reports	id, reporter_id, target_type, target_id, reason, status
game_sessions	id, user_id, game_id, started_at, completed_at, score
reward_ledger	id, user_id, reward_type, amount, direction, reference_id
user_preferences	id, user_id, theme, density, motion, locale, notification_json
dashboard_layouts	id, user_id, role, layout_json, updated_at
audit_logs	id, actor_id, action, entity, before_json, after_json, created_at

20. Layer 7 — Infrastructure

- Cloud VPC/network segmentation; private database; public edge through CDN/WAF/load balancer.
- Containerized API and workers with horizontal scaling.
- Queue/event bus for notification, analytics, WhatsApp, media processing, moderation, reconciliation.
- Secrets manager; key rotation; environment separation (dev/staging/prod).
- Observability: structured logs, metrics, distributed tracing, alerting, audit stream.
- Backup: automated database backups, point-in-time recovery, object storage versioning.
- CI/CD: migration checks, unit/integration/contract tests, security scan, rollback strategy.
- Disaster recovery: define RPO/RTO and rehearse restoration.

21. Security, Privacy & Governance

- MFA for finance/admin; revocable sessions; least-privilege RBAC.
- TLS in transit; encryption at rest where supported; secrets never in source code.
- Minimize PII; retention and deletion policies by data class.
- Payment credentials never stored; use certified payment gateway/tokenization.
- Audit role changes, refunds, financial adjustments, configuration changes, moderation actions.
- Rate-limit login, OTP, payment, promo validation, game attempts, community posting, and public APIs.
- Curhat content is sensitive user-generated content: access restricted, excluded from normal KPI views, and retained only as policy requires.
- WhatsApp communications require explicit channel consent and approved templates/policies.
- Community moderation actions must be auditable and support appeal/review.

22. Non-Functional Requirements

Area	Requirement
Performance	p95 read <500ms; p95 write <800ms excluding external payment; dashboard can use cache/aggregates
Availability	Core booking/payment target ≥99.5% monthly for MVP
Scalability	Horizontal API + independent worker scaling
Consistency	Strong: booking/payment/ledger; eventual: analytics/search/community counters
Reliability	Idempotency, retries, exponential backoff, DLQ
Observability	Logs, metrics, traces, alerts for payment/reconciliation/SLA
Accessibility	Keyboard navigation, labels, contrast, reduced motion, text scaling
Maintainability	Automated tests, migrations, contract tests, feature flags

23. Analytics & Event Tracking

- Core funnel: Visitors → Leads → Booking → Paid → Completed.
- Marketing: first-touch + last-touch UTM/source with explicit attribution window.
- Support: ticket_created, first_response, status_changed, sla_breached, resolved, reopened, csat_submitted.
- Community: curhat_created, viewed, reacted, commented, reported, moderated; dashboard shows only aggregated/privacy-safe metrics.
- Game: game_start, game_complete, challenge_joined, reward_earned, reward_redeemed.
- Personalization: theme_changed, layout_changed, widget_pinned, reduced_motion_enabled.

24. Management Dashboard — KPI Model

Dashboard	Widgets	Filters
Sales	Bookings, GMV, AOV, status	Date, city, service, provider
Revenue	Admin, subscription, promotion, brand campaign	Date, revenue stream
Profitability	Payment fee, refund, marketing, op cost, net profit	Month, cost category
Customer	Visitors, leads, conversion, new/repeat, CAC	Source/campaign, city, period
Provider	Active, booking, GMV, rating, plan, promotion	City, plan, status
Marketing	Spend, CPB, CAC, conversion, ROI	Channel, campaign, period
Support	Open tickets, SLA breach, response/resolution time, CSAT	Priority, category, agent
Community	Posts, reports, moderation queue, safety trend	Topic, period
Engagement	DAU, game sessions, challenge participation, reward redemption	Cohort, period

25. Booking State Machine

DRAFT → PENDING_PAYMENT → PAID → PROVIDER_ACCEPTED → IN_PROGRESS → COMPLETED

- Exception: PENDING_PAYMENT → EXPIRED.
- Exception: PAID → CANCELLATION_REQUESTED → REFUNDED / PARTIALLY_REFUNDED.
- Manual status override requires privileged role, reason, before/after snapshot, and audit event.
- WhatsApp and notification events are triggered from state changes, not from UI clicks.

26. MVP / Release Acceptance Criteria

ID	Acceptance Criterion
AC-01	Customer searches by city/service and sees provider, package, price, rating, availability.
AC-02	Concurrent booking attempts cannot reserve the same slot twice.
AC-03	Booking persists immutable gross, promo, discount, net, fees and payable.
AC-04	Duplicate payment webhooks do not duplicate payment/revenue records.
AC-05	Refund creates reversal event without deleting historical financial records.
AC-06	Provider manages packages, availability, booking and subscription entitlement.
AC-07	Dashboard GMV and booking count reconcile to transaction source for selected period.
AC-08	P&L; exposes revenue streams, fees, refund, marketing, operational cost and net profit.
AC-09	Privileged mutations produce actor/time/action/entity/before-after audit logs.
AC-10	OpenAPI documentation and automated contract tests exist for core APIs.
AC-11	WhatsApp opt-in/out and webhook idempotency are tested.
AC-12	Complaint SLA and escalation are measurable end-to-end.
AC-13	Curhat privacy, moderation, reporting and retention controls are tested.
AC-14	Game reward ledger prevents duplicate reward redemption.
AC-15	User can customize dashboard and reset to role default.

27. Financial Baseline & Source Mapping

Metric	Calculation	Result
Net Booking	GMV – Discount	Rp86.012.000
Admin Fee	10% × Net Booking	Rp8.601.200
Transaction Net Platform Revenue	Admin – Payment Fee – Refund	Rp6.380.900
Subscription Revenue	Basic + Pro	Rp14.092.000
Promotion Revenue	Provider + Brand	Rp19.298.000
Total Platform Revenue	Admin + Subscription + Promotion	Rp41.991.200
Net Profit	Revenue – Payment Fee – Refund – Marketing – Operational	Rp27.470.900

Workbook / Source Area	Target Domain
Transaksi	Booking + Payment + Ledger
Subscription	Provider monetization
Promosi	Promotion + Brand Campaign
Customer Funnel / CRM	Customers + marketing events + KPI marts
Marketing	Marketing spend + attribution
P&L;	Ledger + cost entries + P&L; read model
Fotografer	Providers + packages + provider metrics
Harian	Daily analytics
Validasi Data	Data quality rules + lineage

28. Implementation Roadmap

Phase	Scope	Output
0 — Foundation	Architecture, CI/CD, environments, auth/RBAC, DB, observability	Deployable skeleton
1 — Marketplace	Provider, customer, search, package, availability	Browse → booking draft
2 — Transaction	Booking state, payment, webhook, refund	Production payment flow
3 — Monetization	Subscription, promotion, campaign, ledger	Multi-stream revenue
4 — Operations	Admin, reconciliation, dashboard, support	Management control tower
5 — Engagement	WhatsApp, game, curhat, community moderation	Retention ecosystem
6 — Personalization	Holographic dashboard, widget/layout settings, accessibility	Adaptive experience
7 — Scale	Search index, warehouse, advanced attribution, recommendation	Scalable growth platform

29. Risks & Mitigations

Risk	Impact	Mitigation
Simulation/projection data treated as actual	Wrong decisions	Production validation gate + lineage
Webhook duplication/out-of-order	Double charge/revenue/refund	Idempotency + versioning + reconciliation
Double booking	Customer/provider conflict	Atomic reservation + DB constraint/lock
Promo/game reward abuse	Margin leakage	Eligibility, limits, anomaly monitoring
Curhat privacy leak	Trust + privacy harm	Least privilege + redaction + retention
WhatsApp policy/consent error	User complaints / channel risk	Opt-in, templates, audit, opt-out
Dashboard visual overload	Poor decision quality	Role-based widgets + configurable density
October partial comparison	Misleading growth	Label partial period + normalize by days/run-rate

30. Definition of Done

- Requirement has owner, priority, acceptance criteria, and metric definition.
- API contract documented and versioned.
- Business rules covered by unit/integration tests.
- Database migrations reviewed and rollback considered.
- Financial operations are idempotent and auditable.
- WhatsApp integration has consent, webhook verification, retry, and monitoring.
- Complaint SLA, moderation workflow, and community reporting are operational.
- Game rewards are ledgered and abuse controls are active.
- Holographic dashboard has accessible fallback mode and customizable layout.
- Security review completed for auth, authorization, PII, UGC, secrets, and integrations.
- UAT completed for customer, provider, ops, finance, marketing, moderator, and management.
- Production reconciliation checklist passed.
- Runbook, escalation path, backup/restore, and observability are documented.

Next governance gate: Product + Finance + Operations + Engineering + Security must approve business policy, financial definitions, WhatsApp consent policy, community safety policy, and production KPI definitions before implementation.