King Jam AI

Platform Technical & Business Analysis Report

平台全盤解析報告

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1. Executive Summary

1.1 Platform Overview

King Jam AI is an integrated AI content generation and social media management platform. The platform provides comprehensive solutions for businesses and content creators to generate high-quality blog posts, social media content, and short videos powered by advanced AI models including Google Gemini, Vertex AI (Veo/Imagen), and Kling AI.

1.2 Key Statistics

Metric	Value	Notes
Backend API Endpoints	130+	RESTful APIs
Database Tables	25+	PostgreSQL
Frontend Pages	15	Next.js 14
Background Task Queues	3	Celery Workers
AI Models Integrated	6+	Gemini, Veo, Imagen, Kling
Supported Social Platforms	8	Instagram, TikTok, Facebook, etc.

1.3 Core Value Propositions

- AI-Powered Content Generation - One-click creation of blog posts, social images, and short videos
- Multi-Platform Scheduling - Automated cross-platform content publishing
- Credit Economy System - Complete credit consumption, purchase, and withdrawal mechanism
- Partner Referral Program - Multi-tier commission-based partner program
- Enterprise-Grade Security - Phone verification, identity verification, 2FA, and fraud detection

2. System Architecture

2.1 High-Level Architecture

The platform follows a microservices-inspired architecture with clear separation of concerns. The frontend is built with Next.js 14, communicating with a FastAPI backend through RESTful APIs. Background tasks are handled by Celery workers with Redis as the message broker.

Layer	Technology	Purpose
Frontend	Next.js 14, React 18, TypeScript	User Interface
API Gateway	FastAPI, Uvicorn	REST API Services
Database	PostgreSQL 15	Primary Data Store
Cache/Queue	Redis 7	Caching & Message Queue
Background Tasks	Celery 5.3	Async Task Processing
Scheduler	Celery Beat	Periodic Task Scheduling
Container Runtime	Docker, Docker Compose	Container Orchestration

2.2 Celery Queue Architecture

The system employs three dedicated Celery queues to ensure proper resource allocation and isolation:

Queue	Concurrency	Purpose
queue_high	2 workers	Verification codes, instant notifications
queue_default	4 workers	Social publishing, scheduled tasks
queue_video	1 worker	Video rendering (isolated for OOM prevention)

2.3 Docker Services

Service	Container Name	Port	Memory Limit
Backend API	kingjam_backend	8000	Default

PostgreSQL	kingjam_db	5432	Default
Redis	kingjam_redis	6379	Default
Celery Worker (High)	kingjam_celery_high	-	Default
Celery Worker (Default)	kingjam_celery_default	-	Default
Celery Worker (Video)	kingjam_celery_video	-	4GB
Celery Beat	kingjam_celery_beat	-	Default
Flower Monitor	kingjam_flower	5555	Default

3. AI Generation Engines

3.1 Blog Article Generator

The blog generator uses Google Gemini models to create SEO-optimized articles. It supports multiple writing styles and tone configurations, and can automatically generate cover images using Imagen.

- Multiple AI Models: Gemini 2.5 Flash, Gemini 2.5 Pro, Gemini Pro Latest
- 14 Tone Styles: Professional, Casual, Friendly, Humorous, Educational, etc.
- Automatic SEO Optimization: Title, meta description, keywords
- Cover Image Generation: Basic (no image), Standard, Premium quality

3.2 Social Image Generator

Creates platform-optimized social media posts with AI-generated captions and images. Supports multiple aspect ratios and quality levels.

3.3 Short Video Generator (Director Engine)

The Director Engine is a sophisticated two-stage video generation system:

Stage	Function	AI Model
Script Generation	Convert topic to structured scenes	Google Gemini
Video Rendering	Generate actual video content	Veo 3 / Kling AI / Imagen+FFmpeg

3.4 Video Model Comparison

Model	Duration	Resolution	Cost (Credits)	Best For
Kling v2.1	5s	720p	30	Budget-friendly
Kling v2.1	10s	720p	55	Longer budget content
Kling v2.1 Pro	5s	1080p	50	Higher quality
Kling v2.1 Pro	10s	1080p	90	Best value (Recommended)
Veo 3 Fast	8s	HD	200	Premium quality
Veo 3 Pro	8s	HD	350	Top-tier quality

magen + FFmpeg	Any	Custom	50-120	Basic synthesis

4. Credit & Financial System

4.1 Credit Categories

The platform implements a sophisticated credit ledger system with four distinct categories, each with specific characteristics and consumption order:

Category	Code	Source	Validity	Refundable
Promo Credits	PROMO	New user tasks, marketing	7-30 days	No
Subscription Credits	SUB	Monthly subscription	Current month	No
Paid Credits	PAID	Direct purchase	Permanent	Yes
Bonus Credits	BONUS	Referral commissions	Permanent	Withdrawable

Consumption Order: PROMO → SUB → PAID → BONUS
This order ensures promotional credits are used first (before expiry), while BONUS credits (equivalent to cash) are preserved for potential withdrawal.

4.2 Transaction Atomicity

The credit system implements database-level protection to ensure accounting consistency:

- SELECT FOR UPDATE: Row-level locking prevents race conditions
- Single DB Transaction: Balance updates and transaction records are committed together
- PostgreSQL CHECK Constraints: Enforces credits = sum of category credits
- Periodic Consistency Checks: Hourly background verification tasks

4.3 Withdrawal System

Parameter	Value
Exchange Rate	10 Credits = NT$ 1
Minimum Withdrawal	3,000 Credits (NT$ 300)
Maximum Per Request	100,000 Credits
Maximum Per Month	300,000 Credits
Required Verifications	Phone + Identity + 2FA

5. Referral & Partner Program

5.1 Partner Tiers

Tier	Requirements	Commission Rate	Bonus per Referral
Bronze	Default	10%	200 PROMO credits
Silver	10 referrals + NT$5,000	15%	300 PROMO + Monthly bonus
Gold	30 referrals + NT$20,000	20%	500 PROMO + Monthly bonus

5.2 Referral Bonus Table

Subscription Plan	Price (TWD)	Bronze Bonus	Silver Bonus	Gold Bonus
Basic	NT$ 299	300 pts	450 pts	600 pts
Pro	NT$ 699	700 pts	1,050 pts	1,400 pts
Enterprise	NT$ 3,699	3,700 pts	5,550 pts	7,400 pts

5.3 Referral Flow

- 1. User A generates unique referral code
- 2. User B registers using User A's referral code
- 3. User A receives 200 PROMO credits immediately
- 4. User B subscribes to a paid plan
- 5. Commission calculated based on User A's partner tier
- 6. BONUS credits awarded to User A within 24 hours
- 7. User A can withdraw BONUS credits as cash (10:1 rate)

6. Scheduling & Publishing

6.1 Supported Platforms

Platform	Content Types	OAuth Status	Auto-Publishing
Instagram	Image, Carousel, Reels	Meta Business API	Yes
Facebook	Image, Video, Link	Meta Business API	Yes
TikTok	Video	TikTok for Business	Yes
LinkedIn	Image, Video, Article	LinkedIn API	Yes
YouTube	Video, Shorts	Google OAuth	Yes
LINE	Message, Image	LINE Messaging API	Yes
WordPress	Article, Page	REST API	Yes
Threads	Text, Image	Meta API	Planned

6.2 Scheduling Features

- Cross-platform unified scheduling interface
- Smart publishing time suggestions based on audience analytics
- Batch scheduling for multiple posts
- Automatic OAuth token refresh (24-hour cycle)
- Automatic retry on failure (up to 3 attempts with exponential backoff)
- Real-time publish status tracking with detailed logs

6.3 Post Status Flow

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pending → queued → publishing → published/failed
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7. Security & Fraud Detection

7.1 Authentication System

Mechanism	Implementation	Purpose
JWT Tokens	HS256, 24h expiry	API Authentication
Password Hashing	bcrypt (cost=12)	Credential Protection
Phone Verification	SMS OTP (6-digit)	Account Verification
Identity Verification	ID card + AI validation	KYC Compliance
Two-Factor Auth	TOTP (RFC 6238)	Withdrawal Security

7.2 Fraud Detection System

The platform implements comprehensive fraud detection to prevent referral abuse:

- IP Address Tracking: Detects multiple accounts from same IP
- Device Fingerprinting: Identifies same device across accounts
- Risk Scoring: Automated risk assessment (Low/Medium/High/Blocked)
- Suspicious Referral Detection: Identifies self-referral patterns
- Automatic Bonus Blocking: Suspends rewards for flagged accounts
- Admin Alert System: Real-time notifications for high-risk activities

7.3 Device Fingerprint Collection

Data Point	Purpose
Screen Resolution	Device identification
Timezone	Location approximation
Browser Language	User profile
Canvas Fingerprint	Unique device signature
WebGL Renderer	GPU identification
Installed Fonts	System fingerprint
Audio Context	Hardware signature

8. Monitoring & Alerting

8.1 Health Check System

Check Type	Frequency	Threshold	Alert Level
Quick Ping	1 minute	N/A	INFO
Worker Heartbeat	2 minutes	60s timeout	WARNING
Full Health Check	5 minutes	Multiple	CRITICAL
Memory Usage	5 minutes	80%/90%	WARNING/CRITICAL
Disk Usage	5 minutes	80%/90%	WARNING/CRITICAL
Queue Length	5 minutes	100/500	WARNING/CRITICAL

8.2 Alert Channels

- Slack Webhook: Real-time team notifications
- Email (SendGrid): Detailed incident reports
- LINE Notify: Mobile alerts for critical issues
- Console Logging: Always-on debug output

8.3 Alert Suppression

To prevent alert storms, the system implements cooldown periods: WARNING alerts have a 5-minute cooldown, while CRITICAL alerts have a 1-minute cooldown.

9. Data Lifecycle Management

9.1 Media Retention Policies

Media Type	Retention Period	Storage Location
Short Videos	7 days	Local + Cloudflare R2
Social Images	14 days	Local + Cloudflare R2
Blog Images	14 days	Local + Cloudflare R2
Scheduled Media	30 days	Local + Cloudflare R2
Thumbnails	Same as parent	Local

9.2 Cleanup Tasks

Task	Schedule	Queue
Expired Media Cleanup	Daily at 4 AM	queue_default
Temp Files Cleanup	Every 6 hours	queue_default
Credit Consistency Check	Hourly	queue_default
Token Refresh	Hourly	queue_default

9.3 OOM Prevention Measures

• Docker Memory Limits: 4GB limit for video worker

• Worker Isolation: Dedicated worker for video rendering

• Task Limits: max-tasks-per-child=10, prefetch-multiplier=1

• Rate Limiting: 10 video tasks per minute (global)

• Memory Monitoring: psutil-based checks before task execution

• Automatic Garbage Collection: On task failure

10. Frontend UX/UI Analysis

10.1 Technology Stack

Technology	Version	Purpose
Next.js	14.x	React Framework (App Router)
React	18.x	UI Library
TypeScript	5.x	Type Safety
Tailwind CSS	3.4	Utility-First Styling
shadcn/ui	Latest	Component Library
Lucide React	Latest	Icon Library
Sonner	Latest	Toast Notifications
Axios	1.6	HTTP Client

10.2 Page Structure

Route	Page Name	Function
/login	Login	User authentication
/dashboard	Dashboard	Main overview
/dashboard/blog	Blog Generator	AI article creation
/dashboard/social	Social Generator	Social content creation
/dashboard/video	Video Generator	Short video creation
/dashboard/scheduler	Scheduler	Content scheduling
/dashboard/accounts	Accounts	Social account management
/dashboard/credits	Credits	Credit wallet
/dashboard/referral	Referral	Partner program
/dashboard/profile	Profile	User profile
/dashboard/history	History	Generation history

/dashboard/settings	Settings	Account settings
/dashboard/notifications	Notifications	Message center

10.3 Design System

- Dark Theme: Slate-based color palette (slate-800/900)
- Gradient Accents: Pink-to-Rose, Cyan-to-Blue gradients
- Responsive Layout: Mobile-first with sidebar navigation
- Toast Notifications: Sonner with custom dark styling
- Loading States: Skeleton loaders and spinners
- Micro-interactions: Hover effects, transitions

11. Business Model

11.1 Subscription Plans

Plan	Monthly Price	Monthly Credits	Key Features
Free	NT$ 0	200 (one-time)	Basic features
Basic	NT$ 299	500	Standard features
Pro	NT$ 699	1,500	Advanced features + Priority
Enterprise	NT$ 3,699	10,000	All features + Dedicated support

11.2 Credit Packages

Package	Credits	Price (TWD)	Price per Credit
Starter	500	NT$ 150	NT$ 0.30
Standard	1,000	NT$ 250	NT$ 0.25
Premium	3,000	NT$ 600	NT$ 0.20
Enterprise	10,000	NT$ 1,500	NT$ 0.15

11.3 Revenue Streams

- Subscription Revenue: Monthly recurring revenue from paid plans
- Credit Sales: One-time purchases for additional credits
- Enterprise Contracts: Custom pricing for large organizations
- API Access: (Future) B2B API licensing

12. Technical Specifications

12.1 Backend Dependencies

Package	Version	Purpose
fastapi	0.100+	Web Framework
sqlalchemy	2.0+	ORM
celery	5.3+	Task Queue
redis	5.0+	Redis Client
google-generativeai	Latest	Gemini API
google-genai	Latest	Vertex AI
replicate	Latest	Kling AI
pillow	10.0+	Image Processing
pydantic	2.0+	Data Validation
pyotp	2.9+	2FA Support
psutil	5.9+	System Monitoring

12.2 API Endpoints Summary

Module	Endpoint Prefix	Count
Authentication	/auth	10+
Users	/users	10+
Blog	/blog	8+
Social	/social	6+
Video	/video	12+
Scheduler	/scheduler	15+
Credits	/credits	12+
Referral	/referral	8+

Verification	/verification	10+
Notifications	/notifications	6+
Admin	/admin	15+