**Booking.com Extranet Workflow, Payload, and Validation Design – Prepared by Impetus Strategy**

# **Executive Summary**

Impetus Strategy proposes a focused delivery covering three pillars essential for automating Booking.com Extranet listings: a robust, auditable workflow blueprint; a canonical property payload schema aligned to extranet inputs; and strict constraint/validation rules with human-in-the-loop safeguards. The solution emphasizes determinism first (rule-based mapping and validations), AI-assisted enrichment under confidence controls, and end-to-end traceability to reduce manual entry time, minimize errors, and accelerate onboarding.

- Outcome: production-ready workflow design, finalized API payload schema, and executable validation rulebook.

- Approach: rule-based mapping with optional AI enrichment gated by confidence thresholds and human review.

- Controls: RBAC, audit trails, retry strategies, and failure-safe fallbacks for optional fields.

# **Company Introduction**

Impetus Strategy (Strategy Impetus), headquartered in Riyadh, KSA, prioritizes impact beyond profitability. Guided by values of Collaboration, Clarity, and Excellence, our team operates across Digital Social Development, Impact and Sustainability, Economic Development, Strategic Governance, and Environmental Systems. We apply ISO-aligned quality practices, GDPR-conscious data handling, and a stakeholder-centric mindset to deliver robust, compliant solutions.

- Mission: We prioritize impact beyond profitability.

- Standards and QA: ISO 9001, ISO 27001 practices; continuous improvement; stakeholder feedback.

- Languages: Arabic and English support.

# **Understanding of the RFP and Objectives**

The client seeks an end-to-end automation of hotel property listing creation on Booking.com Extranet. The immediate scope is to design: (1) a secure, traceable workflow from user input through automated posting; (2) a canonical property payload schema mapped to extranet fields; and (3) constraint and validation rules that ensure >95% data accuracy, with human review on low confidence, safe defaults for optional inputs, and strict access control. Optional AI-based enrichment from the open web will be limited to non-critical fields and always flagged for review.

- Deliverable focus: workflow blueprint, payload schema, validation/constraint rulebook.

- Risk posture: AI outputs must be grounded; no unverified data used for critical fields.

- Operational goals: reduce manual entry by 80%, enable batch readiness, minimize correction cycles.

# **Technical Approach and Methodology**

We will deliver a deterministic-first system that uses a rules-driven mapping engine, exhaustive validations, and auditable automation, augmented by AI only where confidence is demonstrably high. The approach emphasizes maintainability, resilience to extranet UI changes, and full observability from input to submission.

- Determinism-first mapping and validations to ensure accuracy and repeatability.

- AI assistance for non-critical enrichment under confidence thresholds and human review routing.

- Isolation of concerns: ingestion, mapping, validation, automation, media, and audit as decoupled services.

# **Framework Overview**

The solution consists of modular services: a data ingestion layer (form/uploader/DB), a mapping engine to canonicalize and align fields, a validation engine enforcing constraints, an automation worker for extranet interactions, a media pipeline for images and captions, and an audit/monitoring layer for traceability and error handling.

- Event-driven orchestration with a resilient job queue.

- Immutable audit logs capturing payloads, mappings, validation results, and submission traces.

- Feature flags to toggle AI enrichment and human review paths.

# **Phased Methodology**

We will execute a compact, outcome-oriented sequence to finalize the workflow, payload schema, and constraint set, with rapid iterations and dry-run validations against staging.

- Discovery and alignment: confirm extranet field inventory, mapping assumptions, and required validations.

- Design and prototyping: build canonical schema, rule sets, and workflow orchestration with sample properties.

- Validation and hardening: unit tests, schema conformance checks, and dry-run automation in staging.

- Handover: documentation, rulebook, and operational playbooks for review/correction flows.

# **Methodological Pillars**

Our methodology relies on enforceable schemas, layered validations, and strict governance, ensuring the workflow, payload, and constraints remain maintainable and auditable.

- Schema-first engineering: single source of truth for fields, types, and constraints.

- Defense-in-depth: pre-ingestion checks, mapping validations, and pre-submit guards.

- Observability: structured logs, metrics, and alerting for rapid fault isolation and rollback.

- Human-in-the-loop: gated releases and review queues for low-confidence or ambiguous data.

# **Project Architecture**

The architecture separates data concerns from automation concerns and provides clear interfaces between ingestion, mapping, validation, and extranet submission. This isolation allows rapid updates to UI automation without impacting schema or validations.

- Stateless API services with a shared relational datastore for mappings and audit.

- Queue-based automation workers for scalable concurrent submissions.

- Media subsystem for image validation, transformation, and caption alignment.

# **System Components**

Core components deliver ingestion, mapping, schema enforcement, automation, and observability, designed for maintainability and fault tolerance.

- Ingestion Service: accepts Excel uploads, form entries, or DB-sourced records.

- Mapping Engine: maps internal keys to canonical schema and extranet fields.

- Validation Service: enforces required fields, formats, geospatial checks, and business rules.

- Automation Worker: handles authenticated sessions, form population, retries, and backoff.

- Media Pipeline: validates image URLs, performs transformations, and binds captions.

- Audit and Monitoring: immutable logs, event traces, and alerting for failures or drift.

# **Data Flow & Integration**

Data flows from user ingestion to automation via a canonical schema and rule-based validations. Each transition is logged with a correlation ID for traceability and post-incident analysis.

- User Input → Ingestion → Canonicalization → Validation → Automation → Confirmation/Audit.

- Optional AI Enrichment: non-critical fields only; confidence gating and human review queue.

- External Touchpoints: Booking.com Extranet via secure browser automation with session management.

# **Technology Stack**

A modern, testable stack is proposed to meet the workflow, payload, and validation objectives with high reliability and observability.

- All selections prioritize maintainability, testability, and security-by-design.

- Open-source first, with minimal vendor lock-in.

- Bilingual UX readiness for Arabic and English where applicable.

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| **Layer** | **Proposed Technology** | **Purpose** |
| Backend Runtime | Node.js (TypeScript) | Type-safe services for ingestion, mapping, and validations |
| Automation | Playwright | Reliable browser automation for Booking.com Extranet |
| Data Store | PostgreSQL | Canonical payloads, mappings, audits, and job states |
| Queue/Jobs | Redis + BullMQ | Orchestration of batch jobs, retries, backoff, concurrency control |
| Schema & Validation | JSON Schema + Zod | Schema-first model and layered validations |
| API | RESTful services | Submit, validate, and retrieve payloads and job statuses |
| Media | Sharp or equivalent | Image verification, resizing, and format normalization |
| Observability | Structured logs + metrics + alerting | Auditability, SLA tracking, and issue triage |
| Security | RBAC, secret vault, TLS | Access control, credential management, transport security |
| AI (Optional) | LLM via abstraction layer | Confidence-gated enrichment for non-critical fields only |

# **Relevant Experience and Case Evidence**

Impetus Strategy has led complex, data-intensive engagements with rigorous validation and stakeholder workflows. Our portfolio includes large-scale social and economic surveys and community needs assessments with millions of beneficiaries, demonstrating our ability to design reliable data pipelines, enforce quality controls, and deliver measurable outcomes.

- Social and Economic Surveys for Priority Areas: 5M+ beneficiaries, 6 consultations.

- Social Needs Assessment and Institutional Capacity Assessment: 7M+ beneficiaries, 12 consultations.

- Practice standards: ISO 9001 and ISO 27001-aligned processes; GDPR-conscious data practices.

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| **Project** | **Scope Highlight** | **Outcome** |
| Social and Economic Surveys (Phase 1) | Large-scale data collection and validation | 5M+ beneficiaries; 6 consultations |
| Social Needs & Institutional Capacity Assessment | Structured assessments and stakeholder engagement | 7M+ beneficiaries; 12 consultations |

# **Project Team and Roles**

A compact, senior-led team will deliver the workflow blueprint, payload schema, and validation rulebook with strong QA and governance.

- Solution Architect: end-to-end design, workflow, and schema authority.

- Backend Engineer: mapping engine, validation service, and APIs.

- Automation Engineer: Playwright flows, session management, and retries.

- Data/ML Engineer (optional): AI enrichment framework and confidence gating.

- QA Lead: test strategy, schema conformance, and negative testing.

- DevOps Engineer: CI/CD, secrets, observability, and release readiness.

- Engagement Lead: stakeholder coordination and documentation delivery.

# **Work Plan, Timeline, and Milestones**

The plan targets rapid convergence on the workflow, schema, and validations with staged dry-runs and stakeholder review checkpoints.

- Week 1: field inventory, mapping assumptions, and workflow blueprint v1.

- Week 2: canonical payload schema v1, validation rulebook v1, sample data tests.

- Week 3: automation prototypes, pre-submit validation gates, audit logging.

- Week 4: dry-run in staging with 2–3 properties, refinements, and sign-off.

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| **Milestone** | **Primary Output** | **Acceptance Cue** |
| Workflow Blueprint | End-to-end sequence with decision points | Stakeholder alignment |
| Schema Finalization | Canonical JSON schema + mapping dictionary | Schema validation passes on samples |
| Validation Rulebook | Required/optional rules, fallbacks, and errors | Unit and integration tests green |
| Dry-Run Staging | Successful submissions and audits | UAT approval |

# **Quality Assurance and Risk Management**

QA emphasizes schema conformance, negative testing, and resilience to UI changes. Risks are mitigated through strict gating, observability, and rapid rollback options.

- Tests: unit (rules), contract (schema), integration (automation), and synthetic data sets.

- Drift protection: Playwright selectors with resilience patterns; monitors for UI changes.

- Risk mitigations: versioned schemas, feature flags, and manual fallback path.

- Security QA: RBAC, credential vault checks, and audit-log completeness.

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| **Risk** | **Impact** | **Mitigation** |
| Extranet UI changes | Automation failures | Selector resilience, monitors, quick patch cadence |
| Low-confidence AI enrichment | Incorrect fields | Confidence thresholds, human review routing, disable switch |
| Invalid media | Submission rejection | Pre-upload validation and retries |

# **KPIs and Service Levels**

KPIs focus on workflow determinism, schema adherence, and validation effectiveness to support accuracy and speed objectives.

- Schema conformance rate ≥ 99% before submission.

- Critical-field accuracy ≥ 95% in dry-runs.

- Automation pass rate ≥ 98% with retry/backoff controls.

- Mean time to detect UI change ≤ 30 minutes via monitoring alerts.

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| **KPI** | **Target** | **Measurement** |
| Schema Conformance | ≥ 99% | JSON Schema validation pre-submit |
| Critical Accuracy | ≥ 95% | Manual spot-checks and correction rates |
| Automation Pass Rate | ≥ 98% | Job success metrics and retries |
| UI Drift Detection | ≤ 30 min | Synthetic checks and alerting |

# **Data Privacy, Security, and IP**

We apply GDPR-conscious handling, ISO-aligned controls, and principle of least privilege. All credentials are vaulted; audit logs are immutable and access-controlled. IP for configuration artifacts (schemas, mappings, rulebooks) can be assigned to the client as agreed.

- Security: TLS, RBAC, credential vaulting, and minimal privilege.

- Privacy: GDPR considerations for personal data; no scraping of sensitive content.

- Auditability: end-to-end logging with correlation IDs and tamper-evident storage.

- IP: client ownership of schema, mappings, and validations upon completion (as contracted).

# **Compliance with RFP Requirements**

Our scope directly addresses the requested workflow, payload format, and constraints/validation rules, including human review gates and safe defaults.

- Workflow: user input → parsing → validation → payload → automated posting → notification.

- Payload: canonical JSON covering property, rooms, amenities, policies, and images.

- Constraints: RBAC, mandatory-field aborts, confidence thresholds, and defaults for optional fields.

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| **RFP Focus** | **Requirement** | **Our Response** |
| System Workflow | End-to-end automation with review path | Blueprint with gated AI and auditability |
| API Payload | Canonical property schema | JSON schema + mapping dictionary |
| Validation Rules | Mandatory checks, confidence gating | Rulebook with tests and fallbacks |

# **Deliverables Summary**

The engagement delivers a ready-to-implement design set: workflow blueprint, canonical schema, and comprehensive validation rulebook accompanied by reference implementations and tests.

- Workflow Blueprint with decision points and error-handling paths.

- Canonical JSON Schema and field mapping dictionary to Booking.com Extranet.

- Validation and Constraints Rulebook with test suites and sample payloads.

- Automation Prototype (Playwright) for staging dry-runs and audit logs.

- Operational Playbooks: human review, rollback, and exception handling.

# **Assumptions**

The following assumptions bound the scope to workflow, payload, and validations as requested and ensure safe execution in staging before production rollout.

- Access to a Booking.com staging/sandbox or a non-production account for dry-runs.

- Availability of internal Excel form structure and sample datasets.

- Permission to use browser automation for Extranet interactions.

- Image hosting is accessible and stable for validation and upload steps.

# **Pricing Approach (Summary)**

We recommend a fixed-fee model for the defined deliverables (workflow, payload schema, validation rulebook, and staging prototype), with time-and-materials for optional AI enrichment tuning and additional integrations.

- Fixed fee: core workflow, schema, validations, and staging prototype.

- T&M: AI enrichment configuration, extended batch tooling, and change requests.

- Transparent change control for out-of-scope items and iterative refinements.

# **Why Impetus Strategy**

Impetus Strategy combines rigorous, standards-aligned delivery with sector breadth and a mission-driven ethos. Our bilingual capability, stakeholder-centric execution, and proven handling of large-scale, quality-critical datasets position us to deliver a deterministic, auditable automation design that meets your accuracy and speed targets.

- Impact-first ethos with ISO-aligned rigor (ISO 9001, ISO 27001 practices).

- Proven in large-scale data programs with measurable outcomes.

- Clear governance: schema-first, validation-centric, and audit-ready.

- Bilingual delivery (Arabic/English) and stakeholder engagement expertise.