Service Definition Document: Skyral Decision Support and Problem Solving as a Service for Healthcare

Service Name: Skyral Decision Support and Problem Solving as a Service for Healthcare
Supplier Name: Skyral Defence Ltd
Framework and Lot: G-Cloud 15, Lot 3

Version Number: v1.0

Date: 14 January 2026

Status: Final

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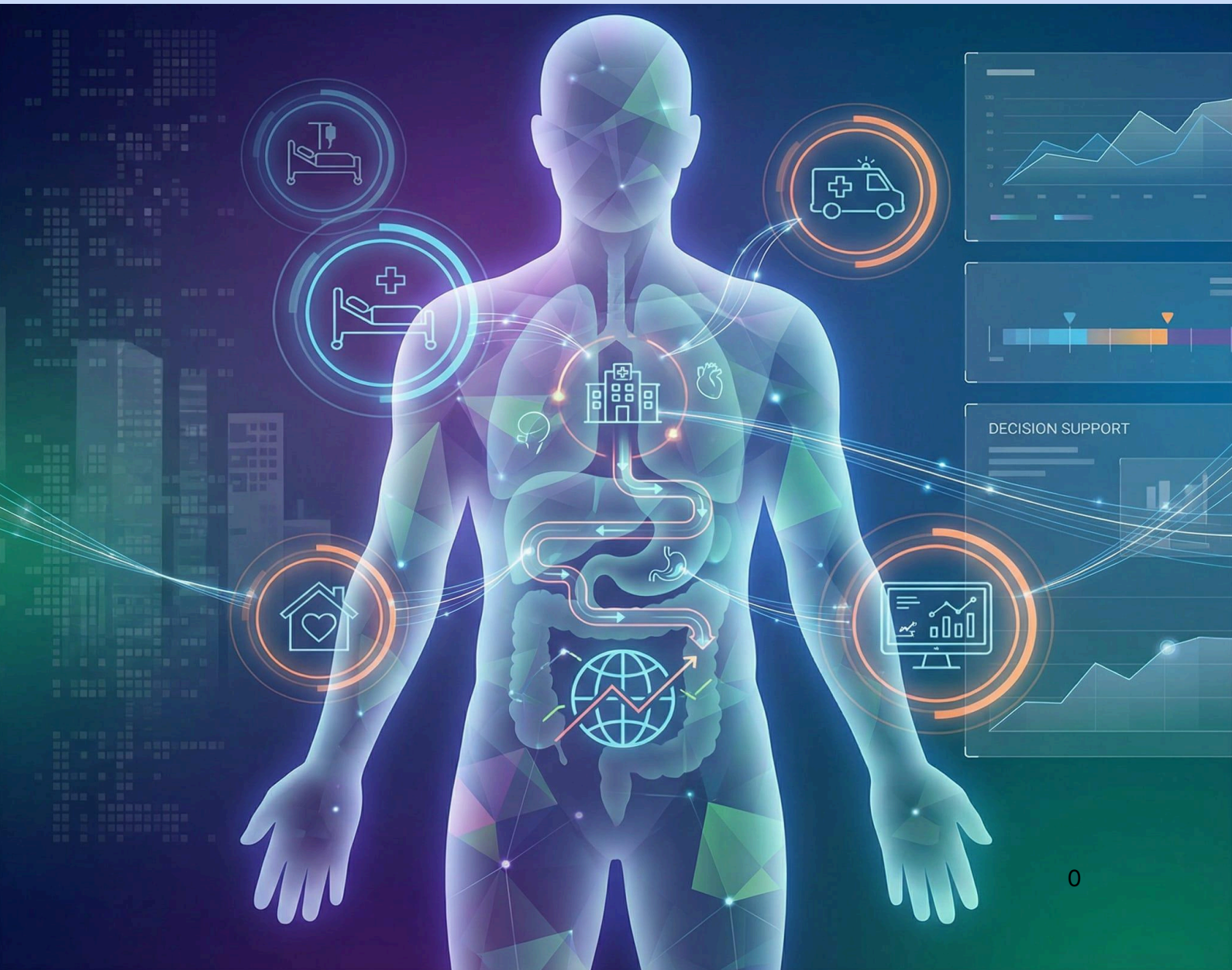
Approver: Skyral Product Leadership



1. About Skyral

Skyral is a UK-headquartered modelling, simulation and decision-support company. It helps governments, health ministries, providers and public-health agencies design and run better health systems. Skyral builds digital twins (virtual models of a real system) and agent-based models (simulations of how many individual patients, staff and services behave and interact). These show how patients, staff, assets, logistics and infrastructure affect each other under different conditions. AI is built into this work. It drives how simulated people make decisions, helps calibrate models against real data and searches thousands of intervention combinations to find those with the greatest benefit.

Health customers use Skyral to:

- Test and optimise health strategies, programmes and service changes before implementation.
- Anticipate demand, bottlenecks and surge pressures across hospitals, clinics, community services and supply chains.
- Connect data, models and visualisations to surface the few levers (such as capacity, access, workforce, logistics and pathways) that most affect outcomes, equity and cost.

Skyral Core, Skyral's modelling and simulation platform, provides the tools to build, run and govern digital twins of health systems as long-term decision-support capabilities.

2. Service Overview

Service name

Skyral Decision Support and Problem Solving as a Service

Purpose

This is a focused engagement, typically one month long, that helps health organisations clarify complex policy or operational problems, identify and prioritise the key levers, and define how modelling, simulation and digital twins can best support decisions.

The service is designed to:

- Turn diffuse challenges (e.g. waiting lists, workforce pressures, programme design, regional inequity) into a structured, decision-ready view.
- Produce a prioritised set of interventions, levers and use cases to focus limited resources on.



- Define a clear follow-on path into Skyral Modelling and Simulation Development as a Service or other delivery work to build a reusable health-system digital twin.

The service is delivered at a fixed scope and cost, using a Skyral methodology evolved from the Simulation Scaffolding Framework (SSF), refreshed as a modern decision-support and experimentation approach for complex systems such as health.

Typical duration and team

A standard engagement is one month of effort, delivered by:

- A health / public-sector Subject Matter Expert (SME) with experience in policy, system planning or operations.
- An Applied Scientist specialising in modelling, simulation, analytics and AI methods.
- A Product Owner responsible for mapping outcomes to Skyral services, products and the customer's data and analytics estate.

Longer or multi-phase engagements can be scoped to cover multiple programmes, regions or agencies.

3. Method and Activities

The service follows a structured but flexible method that blends stakeholder insight, causal and probabilistic modelling, and early digital-twin thinking.

Core steps

1. **Clarify the health problem and outcomes**
    - Establish a shared understanding of the core problem (e.g. elective backlog, urgent and emergency pressure, workforce deployment, programme rollout, inequalities).
    - Capture desired outcomes and constraints: access, quality, equity, cost, workforce sustainability, public expectations, regulatory or political commitments.
2. **Map drivers, levers and programmes**
    - Disaggregate the problem using logic trees and causal structures across populations, services, workforce, infrastructure and social determinants.
    - Identify key levers such as clinic footprint, service models, workforce mix and rostering, referral and triage rules, outreach and prevention, logistics and supply.
    - Map how these levers interact across care settings, organisations, geographies and programmes.

3. **Define and refine KPIs and metrics**
    - Identify KPIs and metrics linked directly to key levers and programmes (e.g. waiting times, throughput, coverage, utilisation, avoidable admissions, travel time, cost per outcome).
    - Clarify how trade-offs will be assessed (e.g. access vs cost, speed vs quality, coverage vs workforce constraints, short-term vs long-term outcomes).
4. **Prioritise initiatives and levers**
    - Apply heuristics, cleaving maps and quantitative reasoning to rank candidate initiatives and levers by impact, feasibility, timescale and data availability.
    - Highlight the top few levers and use cases that are most suitable for simulation and digital-twin work, avoiding “boil the ocean” scopes.
5. **Develop a practical work plan**
    - Convert the prioritised levers and initiatives into a concrete work plan that can be taken into Skyral Modelling and Simulation Development as a Service or equivalent build phases.
    - Define data requirements (e.g. activity data, demographics, capacity, workforce, infrastructure, transport), stakeholders, integration points and decision checkpoints.
6. **Introduce modelling, simulation and optimisation options**
    - Show how modelling, simulation and digital twins can be applied to the top-ranked health problems: patient-flow modelling, demand forecasting, workforce optimisation, logistics and supply-chain modelling, access and equity analysis.
    - Discuss candidate approaches (agent-based models, causal graphs, scenario experimentation, optimisation and AI) in terms that clinicians, managers and policymakers can follow. These include AI-assisted search across many combinations of interventions, synthetic populations (simulated people with realistic routines) that avoid using personal data, and machine learning, such as Bayesian neural networks, that extends insight from small data samples and shows how certain each estimate is. For example, for a South-East Asian government’s national childhood stunting programme, AI-powered simulation explored thousands of intervention combinations.
7. **Build a high-level health decision model**
    - Construct a high-level probabilistic or causal representation of the problem—a “strategic scaffold” that can:
        - Capture key levers, outcomes and uncertainties across populations and services.
        - Support simple scenario exploration (e.g. “what if we move clinics?” “what if we change staffing?”) in the short term.
        - Serve as a blueprint for a more detailed health-system digital twin in follow-on work.

How the method has evolved for health

The original SSF focused on mapping strategic problems into probabilistic or causal graphs and refining them with data over time. In this health-focused, updated service:

- SSF is aligned with whole-system health planning, programme logic and population-health concepts, making outputs familiar to strategy, public-health and operational teams.
- It is designed to sit alongside existing analytics, dashboards and forecasting models, bridging the gap between retrospective reporting and dynamic "what-if" simulation.
- Probabilistic techniques are used to reflect uncertainty in demand, behaviour, uptake and compliance, while remaining transparent and explainable to non-technical decision-makers.

4. Service Outputs

At the end of the engagement, the customer receives:

- **Health decision narrative**
  - A clear articulation of the problem, context, constraints and desired outcomes across population health, service performance and sustainability.
  - A visual representation of key drivers, levers and dependencies (e.g. population, access, pathways, workforce, logistics, broader determinants).
- **Prioritised initiatives and levers**
  - A ranked list of programmes, interventions or redesign options with rationale and key assumptions.
  - Identification of the primary lever or small set of levers that offer the best value for simulation and digital-twin work.
- **KPIs and measurement framework**
  - Defined KPIs and metrics mapped directly to key levers and outcomes (e.g. access, quality, equity, cost, resilience).
  - Commentary on how these indicators will be tracked and used in future simulation, reporting and performance-management cycles.
- **High-level decision model**
  - A high-level probabilistic or causal model of the health-system problem, suitable as a scaffold for further modelling and as an aid for engaging boards, ministers or partners.
- **Follow-on delivery plan**
  - A concise plan for progressing into Skyral Modelling and Simulation Development as a Service or other delivery, including recommended focus areas, dependencies and phasing.



- Options for building a full health-system digital twin, integrating with existing data sources and running structured scenario experiments.

Outputs are provided in accessible formats (e.g. slide pack, report and, where appropriate, simple interactive views) that can be used directly in governance and decision forums. Where generative AI is used to help draft summaries, the text is grounded in model outputs and verified data, cites its evidence, and is checked by Skyral specialists before delivery.

5. Roles and Responsibilities

Skyral roles

Role	Description	Key responsibilities
SME	Health / public-sector expert leading the engagement	Form the core project team; define the health problem; shape initiatives and levers; lead prioritisation and KPI/metric definition; co-create work plan.
Applied Scientist	Modelling, simulation and analytics specialist	Understand programmes and initiatives; gather and analyse data; support KPI design; apply statistics and heuristics for prioritisation; assess modelling feasibility.
Product Owner	Owns service delivery and transition into Skyral products	Plan and manage the work; translate outcomes into Skyral services and products; define follow-on Modelling and Simulation Development as a Service scope.

Customer responsibilities

- Provide access to relevant policy, planning, clinical, operational and analytics stakeholders.
- Share existing strategies, programme plans, metrics and anonymised or appropriately governed datasets where necessary.
- Confirm regulatory, information-governance and data-protection constraints early.
- Participate in workshops, reviews and prioritisation sessions; agree scope boundaries, timelines and decision processes.

6. Service Features and Benefits for Health

Key features

- Whole-system problem definition and outcome framing across populations, services and programmes.
- Causal and probabilistic mapping of health-system drivers and levers.
- Design of KPIs and measurement frameworks linked directly to interventions and outcomes.
- Evidence-based prioritisation of initiatives and levers for maximum impact.
- High-level decision model that can be extended into a digital twin of the health system or programme.
- Clear work plan and options for follow-on modelling, optimisation and scenario testing.
- AI-assisted intervention search and synthetic populations to test options at scale.

Key benefits

- **Faster clarity for leaders and teams**: Move from diffuse pressure and long issue lists to a precise, shared picture of what matters most for outcomes, equity and sustainability.
- **Better focus of scarce resources**: Concentrate analytics, modelling, workforce and investment on the interventions and levers that deliver the greatest benefit.
- **Decision-ready simulation scope**: Enter digital-twin and modelling work with a well-framed, prioritised scope, reducing rework and delivery risk.
- **Explainable and trustworthy**: Use transparent causal and probabilistic models, and AI that is explainable by design, that clinicians, managers and policymakers can understand and challenge, rather than opaque black-box approaches.
- **Smooth path into health digital twins**: Treat this service as the front-end to Skyral Modelling and Simulation Development as a Service, ensuring any subsequent digital twin remains tightly tied to real health-system decisions and outcomes.

7. Dependencies and prerequisites (including customer responsibilities)

This service depends on access to sufficient healthcare and operational context to build a meaningful decision narrative and work plan.

Key prerequisites (customer side):

- Access to relevant stakeholders across policy, planning, clinical services, operations, finance, public health and analytics, including decision-makers able to agree priorities and scope.



- Provision of current and target-state information about the health system or programmes in scope, such as pathways, service footprints, facility locations, clinic and hospital networks, community services, and major programme or reform plans.
- Provision of representative demand, activity, capacity and cost data where available: activity by pathway and setting, waiting times, throughput, demographic and epidemiological data, workforce numbers and rosters, clinic schedules, logistics and supply-chain data, and high-level capex/opex drivers.
- Early confirmation of regulatory, information-governance and data-protection constraints, including rules for using and sharing patient-level data, pseudonymisation/anonymisation, and any cross-border or cross-agency restrictions.

Where underlying tools or datasets are immature or unavailable, Skyral can use proxy data, synthetic demand profiles or partial models to proceed, with limitations and assumptions clearly flagged in the health decision narrative and work plan.

8. Onboarding and implementation approach

Onboarding is structured as a short, time-boxed engagement that moves quickly from problem clarification to decision-ready outputs tailored to health policy and service delivery.

Indicative approach:

- Initiation and scoping
    - Confirm the health questions in scope (e.g. elective backlog, urgent/emergency pressure, programme rollout, regional inequity, surge preparedness) and success criteria (e.g. access, outcomes, equity, cost, workforce sustainability)
    - Agree the populations, programmes, geographies and services in scope, the stakeholder set, cadence of sessions, data access approach and approvals.
- Discovery and data gathering
    - Run structured workshops with policy, planning, clinical, operational and analytics teams to map pathways, drivers, levers, programmes and constraints using Skyral’s Simulation Scaffolding-derived method for health.
    - Ingest and review existing strategies, programme documents, performance reports, epidemiological analyses, workforce plans, logistics/supply-chain information and any existing models or dashboards.
- Modelling and prioritisation
    - Build high-level causal and probabilistic representations of how patients, staff, assets, logistics and infrastructure interact across services and

programmes, including how shocks and interventions cascade through the system.
        - Apply heuristics and quantitative reasoning to rank initiatives and levers by impact, feasibility, timescale, risk and data availability, highlighting those best suited to simulation and digital-twin work.
- Playback and refinement
    - Test interim narratives, initiative lists and KPI frameworks with stakeholders; refine assumptions, levers and scenarios based on clinical, operational and policy feedback.
- Final outputs and transition
    - Deliver the health decision narrative, prioritised initiatives, KPI and measurement framework, high-level decision model and follow-on delivery plan, including options for Skyral Modelling and Simulation Development as a Service and full health-system digital-twin build-out.

9. Configuration, customisation and integration

This service is primarily a consulting and decision-support engagement configured around the customer's specific health-system context, programmes and outcomes.

Configuration and customisation:

- Tailoring of workshops, problem decomposition and logic trees to the health domains in scope (e.g. acute, primary and community care, public-health programmes, mental health, maternal and child health) and to local policy or strategic priorities.
- Custom definition of KPIs, levers and scenarios aligned with the organisation's outcome goals (e.g. mortality and morbidity, equity, access, prevention), operational model and regulatory/political environment.
- Adaptation of high-level models to reflect customer-specific pathways, service models, workforce structures, logistics constraints and social or environmental determinants of health.

Integration (lightweight in this service):

- Use of exports and artefacts from existing health data warehouses, dashboards, planning tools and operational systems (e.g. activity extracts, aggregated patient-flow data, epidemiological datasets, workforce and logistics information) as inputs, without requiring deep technical integration.
- Optional definition, in the follow-on delivery plan, of how future Skyral digital-twin deployments would integrate with existing data platforms, BI tools and operational systems to support ongoing planning and operational decision support (e.g. refresh pipelines, scenario orchestration, optimisation loops).

10. Service levels and performance (including availability targets)

As a time-boxed professional service rather than a 24×7 operational platform, service levels focus on delivery quality, responsiveness and agreed milestones.

Delivery cadence

- Milestones for discovery, interim findings, draft outputs and final deliverables agreed at kick-off and tracked against the one-month (or multi-phase) timeline.
- Responsiveness during the engagement
- Target response to project-related queries within the next UK business day during agreed working hours, with priority given to items that could delay workshops or governance decisions.
- Turnaround for major document/model revisions agreed upfront (for example 3–5 UK business days), dependent on the scale of change and timely customer feedback.

For any Skyral platform components temporarily used (e.g. to host interactive health scenario views), operational characteristics will follow the underlying Skyral Core and SPORE practices in secure cloud or data-centre environments, but formal numerical availability SLAs are normally attached to ongoing managed services, not this shaping engagement.

11. Support model and service desk (hours, channels, response/resolve targets)

Support is delivered by the named Skyral engagement team (SME, Applied Scientist and Product Owner), not a generic helpdesk. The team works through agreed channels, such as email, collaboration tools and scheduled workshops, during UK business hours, with the response targets set out in Section 10.

12. Security model and accreditations (including any ISO, Cyber Essentials, data protection)

Skyral’s approach to security is built around secure-by-design engineering, cloud-neutral deployment via SPORE, and formal certifications.

Security model:

- Support for deployment into secure cloud, on-premises data centres and sovereign or air-gapped environments, with consistent operational, monitoring and governance controls through Skyral’s SPORE layer.



- Role-based access and governance mechanisms across Skyral Core components (Content Catalogue, Scenario Service, Orchestrator, Data Plane, Lens) to ensure that models, scenarios and outputs are controlled, auditable and appropriately segmented.
- Design and operation aligned to data-protection and information-assurance principles relevant to health, defence, national security and other regulated sectors.

Accreditations and standards (certificates available on request):

- Cyber Essentials and Cyber Essentials Plus – Skyral holds both certifications.
- ISO 9001:2015 – Skyral holds certification for quality management (certificate 258084, British Assessment Bureau, valid until 20 June 2027).
- ISO/IEC 27001:2022 – Skyral holds certification for information security management (certificate 258484, British Assessment Bureau, valid until 20 June 2027).

Data protection:

- Customer data used in this service is limited to what is necessary for analysis and scenario framing; where appropriate, anonymisation, aggregation or synthetic data may be used to reduce sensitivity. Synthetic populations let customers test decisions against realistic behaviour without using personal data about real patients.
- Any processing of personal data follows applicable UK data-protection legislation, with roles and responsibilities defined in the underlying contract or data-processing agreement.
- Skyral's use of AI is governed by its AI Business Purpose Policy, which covers approved tools, risk assessment, data protection impact assessments, bias monitoring and human verification of AI-generated content.

13. Data management (location, retention, backup, restore, portability)

Data used in this service typically includes health-system planning and performance data: demographics, epidemiology, activity, capacity, workforce, logistics and programme information.

Location:

- Skyral can operate in the cloud, on-premises or sovereign environments using SPORE, enabling deployment of modelling and decision-support components in regions or infrastructures that align with customer and regulatory requirements.



- For this one-month engagement, data and artefacts are usually stored in Skyral's secure collaboration and modelling environments, or in customer-hosted repositories where preferred.

Retention and backup:

- Working data and artefacts (models, narratives, roadmaps) are retained for at least the duration of the engagement plus an agreed period (e.g. 6–12 months) to support follow-on work, unless customer policies require earlier deletion.
- Underlying platforms used by Skyral provide standard backup and resilience capabilities for the environments in which they are deployed; recovery time objectives (RTO/RPO) are normally defined at the platform or managed-service level rather than for this shaping service.

Portability and export:

- Final outputs (documents, diagrams, models at appropriate granularity) are provided in commonly used formats (e.g. Office formats, PDFs, and where possible, model exports or structured configuration/parameter sets) to facilitate reuse by the customer and partners.
- On request, Skyral will support reasonable data export and documentation of model structures to aid internalisation or third-party uptake, subject to licensing and IP terms.

14. Business continuity and disaster recovery approach

- For this service, business continuity focuses on ensuring the engagement can proceed and deliver its outputs despite issues affecting personnel, tools or hosting environments.
- Formal DR metrics (RTO/RPO) and continuity obligations are normally associated with ongoing managed services, and would be detailed in platform-level or enterprise agreements rather than this shaping engagement.

15. Service usage limits and constraints

This is a scoped, time-boxed decision-support engagement rather than an open-ended modelling service.

Typical limits and constraints:

- Duration: standard engagement of approximately one month of effort, with scope sized accordingly; larger or multi-phase engagements require explicit scoping.



- Breadth vs depth: emphasis on high-value problem framing, causal/probabilistic modelling and prioritisation, not on building fully detailed, production-grade digital twins across every part of the network.
- Model fidelity: models are intentionally high-level scaffolds suitable for decision-support and roadmap definition; fine-grained engineering models are delivered in subsequent Skyral Modelling and Simulation Development as a Service or digital-twin programmes.
- Data availability: where data is limited or incomplete, outputs may include caveats and clearly labelled assumptions; this may constrain the robustness of quantitative conclusions.

16. Pricing model and units (linking to framework pricing rules)

The pricing model for this service is a fixed-scope, time-boxed engagement, with options to extend into further phases through follow-on engagements (such as Skyral Synthetic Development Services).

Core structure:

- Core one-month engagement priced as a fixed-price package based on defined deliverables (decision narrative, prioritised initiatives, KPI framework, high-level model, roadmap) and agreed stakeholder footprint.
- Extensions or additional phases (e.g. extra domain deep-dives, expanded stakeholder scope, additional scenario families) priced either as additional fixed-price work packages or time-and-materials under the relevant framework rate card.
- Any subsequent Skyral Modelling and Simulation Development as a Service or digital-twin deployment would be priced separately, reflecting model build effort, platform usage and, where relevant, managed-service components.
- Exact pricing, units (e.g. person-days, work packages) and linkage to framework pricing rules are defined in the commercial schedule.

17. Change management (how changes to scope or volumes are handled)

Change management is designed to protect outcome quality while accommodating evolving questions in complex health-system environments.

- Initial scoping defines the in-scope populations, programmes, geographies, questions, stakeholder groups, indicative datasets and planned workshops/playbacks.
- Material changes (e.g. adding additional regions or programmes, introducing substantially new policy questions, or requiring deeper technical integration



with health data platforms) trigger a joint impact assessment on timelines, effort and deliverables.
- Minor adjustments (e.g. refining KPIs, adjusting prioritisation criteria, adding closely related scenarios) are handled within the existing scope where feasible, with impacts logged and communicated through the governance structure.
- Larger changes require a formal change note or contract variation, which may add work packages, extend timelines and adjust commercial terms (price, units or rate-card usage).

Where Skyral Core is used, its governance tools record which models, content assets and scenarios are affected by an agreed scope change, so the impact of each change can be traced.

18. Exit and offboarding (including data export and handover)

Exit deliverables and handover:

- Provision of final deliverables in agreed formats, including decision narrative, visual driver/lever maps, prioritised initiatives, KPI framework, high-level model description and roadmap.
- Walkthrough session(s) to explain the outputs, underlying assumptions, and how they can be used to inform architecture, planning and operational decisions, as well as the path into digital-twin build-out.
- On request, export of relevant configuration or model artefacts (e.g. scenario definitions, parameter sets, simplified model structures) in documented form, to support internal teams or partner organisations.

Data and environment offboarding:

- Removal or anonymisation of customer-specific data from Skyral environments in line with contractual data-retention terms and any customer-specific security requirements.
- Termination of access for customer users to any temporary, Skyral-hosted interactive scenario views unless explicitly agreed as part of ongoing services

19. Key assumptions and exclusions

Key assumptions:

- The customer provides timely access to stakeholders and data sufficient to meet the agreed timeline and deliverables.



- The primary objective is decision-support, strategy and prioritisation across health policies, programmes and services, not the full production implementation or day-to-day operation of health services or IT systems.
- Initial models and scenarios are intended to compare options, highlight trade-offs and stress-test strategies rather than to deliver exact predictions at every organisational or facility level.

Key exclusions (unless explicitly brought into scope):

- Full-scale, production-grade health-system digital-twin implementation and ongoing integration with live operational systems (e.g. EHRs, PAS, command centres), which are covered by subsequent Skyral Modelling and Simulation Development as a Service and platform services.
- Detailed vendor-specific configuration of clinical or operational systems, low-level software engineering tasks or direct changes to live health-system operations.
- 24×7 operational support, incident management and availability SLAs typical of managed operational platforms.
- Formal regulatory submissions, clinical safety cases or statutory health-system plans; Skyral's outputs can inform these but do not replace formal assurance, clinical governance or regulatory processes.

20. Related services and optional add-ons

Related Skyral services:

- Skyral Modelling and Simulation Development as a Service (Health) – builds detailed health-system digital twins and agent-based models aligned to the prioritised levers and scenarios from this engagement, enabling ongoing "what-if" analysis, optimisation and operational decision-support.
- Skyral Modelling and Simulation Development as a Service (Mobility & Infrastructure) – builds detailed digital twins and agent-based models of cities, corridors, ports, airports, logistics networks and interdependent infrastructures, aligned to the prioritised levers and scenarios from this engagement.
- Skyral Modelling and Simulation Development as a Service (Network Edition): builds detailed network digital twins and agent-based models aligned to the prioritised levers and scenarios identified in this engagement.
- Mission Planning & Decision Support services for defence and national security, using large-scale agent-based modelling to explore courses of action, logistics and resilience across multi-domain operations.
- Health Policy & Programme Strategy simulation services, applying similar techniques to patient flows, resource allocation and intervention strategies for health systems.

Optional add-ons to this specific service:

- Additional deep-dive modules on specific health domains (e.g. urgent and emergency care, elective pathways, maternal and child health, public-health programmes, workforce or supply chains), delivered either as extended discovery within this service or as Skyral Advisory/Synthetics Development phases depending on need.
- Rapid proof-of-concept health digital-twin instances (e.g. for a specific region, programme or pathway) using existing data and synthetic agents to demonstrate interactive scenario analysis and optimisation beyond the initial decision narrative, delivered via Skyral Core and Modelling and Simulation Development as a Service.
- Extended roadmap and business-case support, including structured inputs to investment cases, programme business cases and ministerial decision packs for new health programmes or reforms.
- AI opportunity review: identifying where AI and machine learning could strengthen the customer's demand forecasting, planning and service design, and how to govern its use.

21. Contact, account management and reporting

- E. enquiries@skyral.io
- W. www.skyral.io