**Developer Directive – READ FIRST**

* **Do NOT** rename existing folders.
* **Do NOT** create new folders.
* Only **update** the current structure and files as instructed.

# doganBS Streamlit / Python “One‑App” Feature Catalog – *Dedicated to Omar*

*100+ ready‑to‑embed modules, widgets, and engine stubs for your Strategic Intelligence Suite*

*This document supersedes all previous AFTECH‑branded catalogs; every reference has been updated to* ***doganBS****.*

## A. Core Streamlit UX Widgets (1 – 15)

1. **st.button()** – Standard action trigger.
2. **st.download\_button()** – Export any report (PDF/XLSX/DOCX).
3. **st.file\_uploader()** – Multi‑source uploads (Excel, CSV, PDF).
4. **st.chat\_message()** – In‑app AI conversation pane.
5. **st.progress() / st.spinner()** – Task feedback indicators.
6. **st.toast()** – Non‑blocking notifications (success, warning, error).
7. **st.toggle()** – Mode switches (e.g., Presentation / Edit).
8. **st.dataframe()** – Quick data preview with sort & filter.
9. **st.data\_editor()** – Editable grid for inline corrections.
10. **st.metric()** – KPI card with delta.
11. **st.slider() / st.select\_slider()** – Threshold & scenario controls.
12. **st.selectbox() / st.multiselect()** – Dynamic filter pickers.
13. **st.date\_input() / st.time\_input()** – Scheduling & timeline inputs.
14. **st.camera\_input()** – Capture signatures or document images.
15. **st.tabs() + st.expander()** – Hierarchical, clutter‑free layout.

## B. Advanced Streamlit Components (16 – 25)

1. **streamlit‑option‑menu** – Icon‑driven sidebar navigation.
2. **streamlit‑aggrid** – Spreadsheet‑like grid with formulas & conditional formatting.
3. **streamlit‑extras: copy‑to‑clipboard** – One‑click code / value copy.
4. **streamlit‑extras: keyboard‑shortcuts** – Power‑user productivity keys.
5. **streamlit‑tags** – Keyword tagging for RFQs & knowledge base.
6. **streamlit‑lottie** – Animated success / error cues.
7. **st.components.v1.iframe()** – Embed Power BI, Grafana, or Tableau.
8. **streamlit‑authenticator** – JWT / OAuth role‑based login.
9. **st.session\_state** – Cross‑page memory for drill‑through context.
10. **Custom CSS injector** – RTL/LTR switch + brand colors.

## C. Plotly & Visual Analytics (26 – 40)

1. **Bar / Column Chart** – Revenue vs Target.
2. **Line & Area Chart** – Trend lines with forecast overlay.
3. **Scatter / Bubble Plot** – Margin vs Lead‑time analysis.
4. **Treemap** – GP contribution by sector > vendor.
5. **Sunburst** – Multi‑level hierarchy (Region → Sector → Project).
6. **Sankey Diagram** – Cost flow from Budget to GP.
7. **Funnel Chart** – RFQ → Proposal → Win pipeline.
8. **Gantt / Timeline** – Project schedule & critical path.
9. **Heatmap** – Risk matrix (Impact vs Probability).
10. **Waterfall** – Variance explanation (Plan → Actual).
11. **Gauge / Bullet** – SLA health indicator.
12. **Violin / Box Plot** – Cost distribution & outliers.
13. **Polar Chart** – Capability radar for vendor scoring.
14. **3‑D Surface** – Scenario landscape (Cost, Time, Scope).
15. **Animated Choropleth** – Geo KPI play‑through (if needed).

## D. Data Processing & Quality (41 – 55)

1. **pandas pipe() chains** – Clean, join, aggregate.
2. **pyjanitor.clean\_names()** – Column standardisation.
3. **missingno matrix** – Visual null inspection.
4. **great\_expectations** – Data validation suite.
5. **pydantic models** – Strict schema enforcement.
6. **duckdb SQL** – In‑memory analytics without DB server.
7. **polars** – Lightning‑fast columnar ops for big CSV.
8. **pyarrow parquet cache** – Compressed, rapid reloads.
9. **dask delayed()** – Parallel ETL for large files.
10. **openpyxl / xlsxwriter** – Styled Excel BoQ output.
11. **pdfplumber** – Extract tables from scanned PDFs.
12. **rapidfuzz** – Deduplicate vendor names.
13. **dateparser** – Free‑text date normalisation.
14. **schema‑mapper auto‑align** – Column mismatch resolver.
15. **Custom error handler + logging to CSV & Sentry.**

## E. AI / LLM & Copilot Functions (56 – 70)

1. **OpenAI ChatCompletion** – Natural‑language query & rewrite.
2. **LangChain RetrievalQA** – Ask KPIs “why down?”.
3. **FAISS vector store** – Local semantic search over past proposals.
4. **LlamaIndex (GPT Index)** – Knowledge graph for RFQs.
5. **Haystack Document QA** – PDF contract interrogation.
6. **Auto‑summariser** – 100‑word exec brief generator.
7. **Sentiment & intent classifier** – Vendor email triage.
8. **Keyword extractor** – Auto‑tag RFQs & risks.
9. **Text‑to‑Speech (gTTS)** – Arabic/English voice briefing.
10. **Speech‑to‑Text (Whisper)** – Dictate notes.
11. **OpenAI Function‑Calling** – LLM triggers Streamlit actions.
12. **Time‑series forecasting (Prophet / NeuralProphet).**
13. **Anomaly detection (ADTK / tsfresh).**
14. **Reinforcement learner** – KPI target auto‑optimiser.
15. **Auto‑prompt memory** – Learns user preferences.

## F. KPI & Executive Metrics (71 – 80)

1. **Dynamic KPI card generator** – Plug‑and‑play metric list.
2. **Threshold slider with real‑time color change.**
3. **Drill‑down filter chain (Region → Sector → Project).**
4. **Delta vs Target badges** – 👍 / ⚠️ / ❌ icons.
5. **Snapshot comparator** – Month‑over‑Month toggle.
6. **Weighted scorecard engine** – 0–100 strategic value.
7. **Idle cost tracker** – Live SAR leakage meter.
8. **Compliance percentage ring** – NCA alignment.
9. **Resource utilisation gauge** – Head‑count vs plan.
10. **What‑if simulator panel** – Slider‑based scenario engine.

## G. RFQ / Proposal & Compliance (81 – 90)

1. **RFQ inbox parser (imap\_tools).**
2. **SharePoint list fetch (shareplum).**
3. **docxtpl proposal builder** – Arabic & English templates.
4. **BoQ margin calculator** – Auto‑VAT, markup tiers.
5. **Vendor clarification tracker** – Comment thread per RFQ.
6. **Weighted evaluation matrix with AgGrid.**
7. **NCA baseline checker (YAML rules).**
8. **Etimad form auto‑fill CSV exporter.**
9. **Risk‑flag LLM – highlights non‑compliant clauses.**
10. **PDF merger & stamp for final submission.**

## H. Vendor / Technology Scoring (91 – 95)

1. **Capability radar (Plotly polar).**
2. **CVSS vulnerability pull via NVD API.**
3. **Total‑Cost‑of‑Ownership calculator.**
4. **Cloud readiness heatmap.**
5. **Delivery lead‑time versus SLA scatter.**

## I. Business & Governance Utilities (96 – 100)

1. **streamlit‑authenticator role gates (Admin / Sales / Finance / SPV).**
2. **Audit ledger – CSV log + st.dataframe viewer.**
3. **GitHub webhook badge – show commit hash & agent notes.**
4. **Auto‑email exporter – send PDF to CEO / SVP.**
5. **Health‑check ping panel – SAP / SharePoint / Power BI status.**

## J. Architecture (Front‑End / Back‑End / Data‑Layer)

| Layer | Tech Stack | Folder Scope | Purpose |
| --- | --- | --- | --- |
| **Front‑End** | Streamlit widgets (Sections A–C) + custom CSS | /components/ & /modules/\*\_ui.py | Responsive UI, bilingual RTL/LTR, advanced navigation. |
| **Back‑End** | Python services (Sections D–I) | /modules/ | Data cleansing, AI engines, business logic, API calls. |
| **Data‑Layer** | DuckDB + Parquet cache **inside** /data/ | /data/ | Persistent yet portable storage; no external DB servers. |

*Integrity Rule → All logic must reference existing paths; no folder name changes.*

## K. Predictive Mapping & Role‑Based Guidance

| Role | Smart Screen Set | Predictive & Automation Features |
| --- | --- | --- |
| **Solution Director** | “Solution Cockpit”, “Digital‑Twin Sandbox” | Cost‑risk simulation, vendor capability radar, AI case‑study suggestions. |
| **Sales Director** | “Pipeline Command”, “Deal Acceleration” | Win‑probability scoring, price‑sensitivity curves, auto‑generated battle‑cards. |
| **Commercial Director** | “Margin Guardian”, “Contract Validator” | Real‑time GP drift alerts, BoQ optimiser, NCA/SDAIA compliance audit. |
| **SVP / CEO** | “Executive Dashboard”, “Strategic Brief” | 5‑min AI brief, weighted scorecards, scenario impact snapshots. |
| **Self‑Smart Agent (doganBS Bot)** | Appears on every page via st.chat\_message() | Learns user context, triggers reports, schedules tasks, voice briefing (gTTS). |

**Multi‑Screen Navigation:** utilise streamlit‑option‑menu with icons; session\_state remembers last drill‑path; full‑screen toggle for board‑room mode.

**Mapping & Visual Guidance:** Sankey for cost flow, sunburst for org hierarchy, interactive floor‑map for project sites (if coordinates supplied).

## L. Beyond‑Universe Innovations (101 – 150)

*Exploratory and next‑decade capabilities drawn from field experience and R&D roadmaps.*

| # | Futuristic Feature | Concept Snapshot |
| --- | --- | --- |
| 101 | **Quantum KPI Solver** | Leverages local Qiskit simulator to optimise multi‑variable margins in milliseconds. |
| 102 | **Digital‑Twin Drone Sync** | Auto‑launches a drone flight (via API) to capture live site images and embed in dashboard. |
| 103 | **AR Holo‑Dashboard** | Generates a WebXR layer; view KPIs as floating cards through HoloLens. |
| 104 | **Neural Voice Brief** | Uses Whisper + gTTS for bidirectional voice interaction in noisy environments. |
| 105 | **Blockchain Audit Ledger** | Writes critical RFQ actions as hashes on a private Ethereum testnet for tamper‑proof logs. |
| 106 | **Edge‑ML Model Push** | Exports lightweight TensorFlow Lite models to on‑prem Raspberry Pi gateways. |
| 107 | **Gesture Navigation** | Camera‑based hand‑gesture control for boardroom presentations (using MediaPipe). |
| 108 | **Predictive Cash‑Flow Waterfall** | Combines GPT‑4 trend explanation with Monte‑Carlo cash simulations. |
| 109 | **Dark‑Mode Circadian Shift** | UI auto‑tunes brightness based on local sunset API for eye comfort. |
| 110 | **IoT Sensor Heatmap** | Real‑time Plotly heatmap from MQTT topics; colors drift when anomalies spike. |
| 111 | **5G Latency Monitor** | Pings field routers; shows latency violin plots per vendor eSIM. |
| 112 | **Auto‑Ethical Risk Scanner** | Flags ESG or data‑privacy non‑compliance in proposals via NLP rules. |
| 113 | **CV‑Based Invoice Reader** | YOLO‑v8 detects tables in scanned invoices and routes to BoQ comparison. |
| 114 | **Dynamic Carbon Footprint KPI** | Calculates CO₂ per project phase using emission factors API. |
| 115 | **Gamified Sales League** | Real‑time leaderboard with achievement badges and confetti Lottie on target hit. |
| 116 | **Emotion AI for Calls** | Analyses Teams call sentiment and posts a morale metric. |
| 117 | **Real‑Time FX Hedging Predictor** | Recommends SAR hedge positions via Prophet forecasts + FX API. |
| 118 | **Satellite Weather Overlay** | Pulls NOAA imagery to anticipate logistics delays. |
| 119 | **AI‑Generated Infographic Export** | Creates branded infographic slides in PPTX automatically. |
| 120 | **Zero‑Touch CI/CD** | GitHub Actions auto‑deploy Docker image to internal Kubernetes on merge. |
| 121 | **Self‑Healing ETL** | Detects schema drift → auto‑maps fields or opens ticket. |
| 122 | **Auto‑Narrated Board Pack** | Generates a narrated MP4 walkthrough of monthly KPIs. |
| 123 | **Smart Legal Clause Builder** | GPT prompts build customised SLA clauses in Arabic & English. |
| 124 | **Crowd‑Forecast Module** | Collects distributed probability estimates from team and aggregates Brier score. |
| 125 | **Decentralised ID Login** | DID / verifiable credentials for vendor portal authentication. |
| 126 | **Zero‑Copy Data Share** | Uses Apache Arrow Flight for memory‑mapped data between notebooks. |
| 127 | **Dynamic Pricing Bot** | Scrapes competitor catalogues nightly and suggests price adjustment. |
| 128 | **Haptic Alert Wristband Hook** | Sends vibration alerts to paired smartwatch for SLA breaches. |
| 129 | **AI‑Drawn Org Charts** | Uses Graphviz + GPT to render org diagrams from HR CSV. |
| 130 | **Crowdsourced Translation Memory** | Learns domain Arabic terms across all proposals. |
| 131 | **Cyber‑Threat Feed Panel** | STIX/TAXII ingest; flags vendor vulnerabilities. |
| 132 | **Quantum‑Safe Encryption Toggle** | Optional post‑quantum key exchange for file exports. |
| 133 | **Smart Floor‑Plan Mapper** | Upload AutoCAD → converts to interactive SVG with asset tags. |
| 134 | **Realtime Budget Burn Gauge** | Burns down vs. earned value; colour‑coded. |
| 135 | **Autonomous Meeting Minutes** | Summarises any uploaded Teams recording into action items. |
| 136 | **Emotion‑Responsive Theme** | UI theme shifts hue if user stress sentiment detected. |
| 137 | **Edge‑Cache Offline Pack** | Service‑worker caches last 7 days of dashboards for plane mode. |
| 138 | **Digital‑Sign PDF Sealer** | Applies PAdES signature using corporate HSM. |
| 139 | **Multilingual OCR Extractor** | Arabic/English/French support with Tesseract 5. |
| 140 | **Adaptive Drill‑Path AI** | Suggests most insightful next drill‑through based on click patterns. |
| 141 | **Explainable‑AI Tab** | SHAP plots for every ML prediction used in scoring. |
| 142 | **Live RAG (Retrieval‑Augmented Generation)** | Vendor manuals ingested; answers queries with citations. |
| 143 | **Cloud‑Spend Optimiser** | Connects to Azure cost API; proposes SKU downsizing. |
| 144 | **Interactive KPI Storyboard** | Users drag cards to craft narrative timeline for exec review. |
| 145 | **Green‑Red‑Amber Color‑Blind Safe Palette** | Automatic switch for accessibility compliance. |
| 146 | **RFQ Probability Heat Tiles** | Matrix of win‑rate vs. bid‑load to focus effort. |
| 147 | **Regret‑Loss Simulator** | Shows cost of not bidding vs. losing vs. winning low. |
| 148 | **Dynamic Voice Command Palette** | “Show me GP variance” trigger via local Vosk model. |
| 149 | **Quantum Random Sampling for Stress Tests** | Adds QRNG noise to scenario Monte‑Carlo. |
| 150 | **Robot RPA Trigger** | Exports tasks directly to UiPath queue; opens SAP GUI actions. |

## M. Global Pre‑Built Code & Role Mapping (151 – 200)

Each line lists: **Feature # | Pre‑built Code Stub | Quick‑Start Guidance & Role Mapping**

| # | Code Stub (modules/…) | How to Use | Primary Role |
| --- | --- | --- | --- |
| 151 | predictive\_cash\_flow.py | Import, feed monthly AR/AP; returns Monte‑Carlo dataframe. | Commercial Dir. |
| 152 | ai\_board\_pack.py | Call generate\_board\_pack(date); outputs PPTX. | SVP / CEO |
| 153 | quantum\_kpi.py | Needs qiskit; run solve\_opt(model.json) for optimal margin. | Finance Dir. |
| 154 | drone\_sync.py | Set drone API key env var; schedules flight via schedule\_capture(site\_id). | PMO |
| 155 | holo\_dash\_layer.py | Launch with --webxr; auto‑creates WebXR manifest. | Solution Dir. |
| 156 | voice\_bridge.py | listen\_loop() streams Vosk‑STT commands → triggers callbacks. | Any |
| 157 | blockchain\_audit.py | Runs log\_event(event\_dict); writes to local Ganache. | Audit / Legal |
| 158 | edge\_model\_push.py | push\_model(lite.tflite, gateway\_ip) via SSH. | OT Engineer |
| 159 | gesture\_nav.py | start\_gesture\_control(cam\_id); binds to Streamlit hotkeys. | Presenter |
| 160 | carbon\_calc.py | estimate\_co2(project\_df); returns kg‑equivalent column. | ESG Lead |
| 161 | emotion\_ai.py | analyse\_call(wav\_path); returns sentiment 0‑1. | HR / PMO |
| 162 | fx\_hedge\_predict.py | recommend\_hedge(exposure\_df); prints suggested hedge lots. | CFO |
| 163 | sat\_weather.py | overlay\_weather(coords); returns Plotly map layer. | Logistics |
| 164 | infographic\_maker.py | create\_infographic(kpi\_dict) → PNG. | MarCom |
| 165 | ci\_cd.py | GitHub Action YAML under .github/workflows/deploy.yml. | DevOps |
| 166 | self\_heal\_etl.py | Wrap ETL with with AutoMap(): context manager. | Data Eng. |
| 167 | auto\_narrate.py | narrate\_pptx(pptx\_path); outputs MP4. | SVP |
| 168 | legal\_clause\_builder.py | compose\_clause(requirements); returns bilingual text. | Legal |
| 169 | crowd\_forecast.py | collect\_probs(form\_id); aggregates via Brier score. | Strategy |
| 170 | did\_login.py | FastAPI route /login\_did; uses didkit. | IT Sec. |
| 171 | arrow\_flight\_server.py | Provides zero‑copy dataset at flights://. | Data Eng. |
| 172 | price\_bot.py | Scrapes competitor XML; updates margin sheet. | Sales Ops |
| 173 | haptic\_alert.py | BLE push send\_alert(level) to smartwatch. | Field Ops |
| 174 | org\_chart\_ai.py | render\_org(csv\_path); outputs SVG. | HR |
| 175 | translation\_memory.py | update\_memory(text, lang); improves future prompts. | L10n Lead |
| 176 | cyber\_feed.py | Pulls TAXII feed; showcases table of CVEs. | Cyber Sec. |
| 177 | post\_quantum\_crypto.py | encrypt\_file(file, key\_type="kyber"). | IT Sec. |
| 178 | floorplan\_mapper.py | Parses DXF; outputs interactive SVG. | Facilities |
| 179 | budget\_burn.py | Real‑time gauge via calc\_burn(earned, spent). | PMO |
| 180 | auto\_minutes.py | Transcribes meeting MP4; summarizes. | Any |
| 181 | theme\_stress.py | Listens to mic → adjusts theme color. | UX |
| 182 | edge\_cache.py | SW script under /static/sw.js for offline cache. | Front‑End |
| 183 | pdf\_sealer.py | Signs PDF using openssl pkcs7. | Legal |
| 184 | ocr\_multi.py | Uses tesserocr; returns dataframe of extracted text. | Data Proc. |
| 185 | drill\_ai.py | Suggest next drill path via SHAP on user history. | BI Analyst |
| 186 | explain\_ai.py | SHAP dashboard for any model predictions. | Data Sci. |
| 187 | rag\_qa.py | Retrieval‑Augmented QA FastAPI endpoint. | Tech Support |
| 188 | cloud\_spend.py | Calls Azure cost API; recommends rightsizing. | FinOps |
| 189 | storyboard.py | Drag‑drop Streamlit component under /components/storyboard.js. | Presenter |
| 190 | access\_palette.py | Color‑blind safe palette switcher. | UX |
| 191 | heat\_tile\_rfqs.py | render\_heat(rfq\_df); win probability matrix. | Bid Mgr. |
| 192 | regret\_sim.py | Calculates opportunity cost scenarios. | Strategy |
| 193 | voice\_palette.py | Voice command mapping JSON under /config/voice.json. | Any |
| 194 | qrng\_sampler.py | Calls ANU QRNG API; adds noise to simulations. | Data Sci. |
| 195 | uipath\_trigger.py | Posts job JSON to UiPath Orchestrator. | RPA |
| 196 | mlflow\_tracking.py | Logs all model runs automatically. | Data Sci. |
| 197 | kafka\_event\_bus.py | Publishes KPI events to local Kafka topic. | Integration |
| 198 | meta\_prompt\_store.py | YAML store for reusable GPT prompts. | AI Ops |
| 199 | scenario\_index.py | Catalogs all what‑if scenarios with tags. | Strategy |
| 200 | role\_coach\_bot.py | Persona‑aware GPT wrapper responding per role. | All |

**Implementation Hint:** Each stub lives in /modules/ and can be imported in Streamlit pages. For a quick demo:

from modules.predictive\_cash\_flow import monte\_carlo  
df = monte\_carlo(ar\_df, ap\_df)  
st.plotly\_chart(build\_waterfall(df))

### Deliverable Expectations

* Integrate features **only by updating existing files** – **no extra folders**.
* Maintain naming conventions already in codebase (doganBS\_\*).
* Comment code clearly; log enhancements in CHANGELOG.md.
* Database paths stay within /data/; no path renames.

*This catalog is the definitive developer checklist to build a unified, predictive, role‑aware Strategic Intelligence Suite for doganBS leadership and Omar’s future vision.*