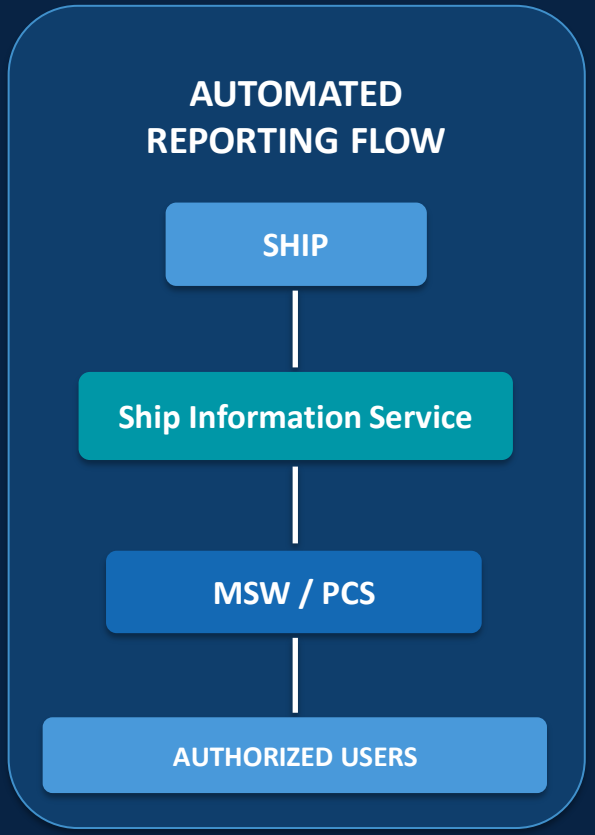
Electronic Business Processes for Planning and Executing Port Calls

From forms and point-to-point messages to governed, event-driven port-call information exchange



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Why the change is necessary

IMO e-navigation SIP Solution S2 calls for standardized and automated reporting; standardization and single-window submission are necessary but not sufficient.

IMO e-navigation Strategy Implementation Plan:
Prioritized Solution S2: "means for standardized and automated reporting"

1 Standardize

The IMO Compendium data directory provides a common, structured basis for reporting data.

2 Consolidate

The Maritime Single Window eliminates most redundant submissions to multiple public authorities.

3 Automate at scale[1]

Ships and shore representatives need Publish–Subscribe exchange to distribute current values securely and efficiently.

The missing step is a scalable, cyber-resilient mechanism for publishing approved ship data element values and allow only authorized consumers to subscribe to updates.

[1] Automation supplements formal declaration, validation, acknowledgement and retention obligations; it does not replace them.

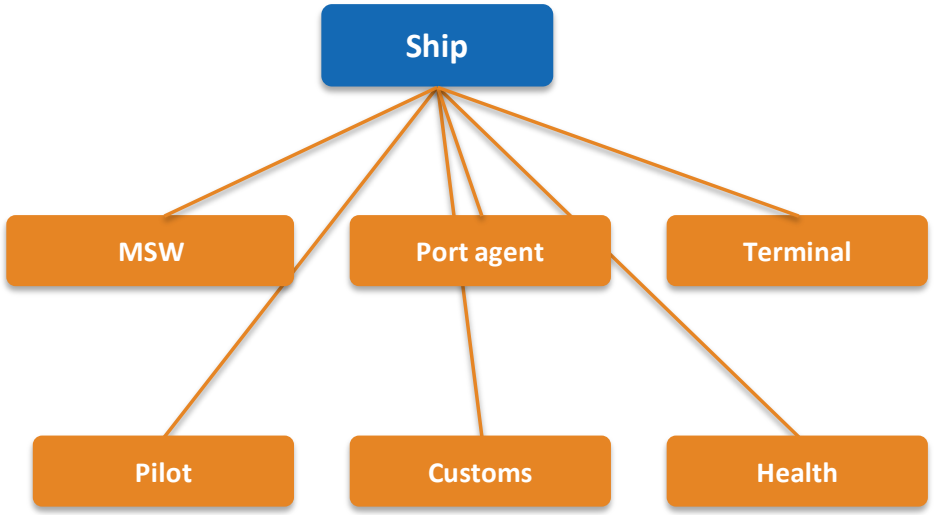
Builds on: IMO Compendium (Data Directory) • IHO S-100 • IALA S-211 • ISO 28005 • ISO 18131 • IEC 63173-2 SECOM • Maritime Connectivity Platform (MCP)

Why point-to-point reporting does not scale

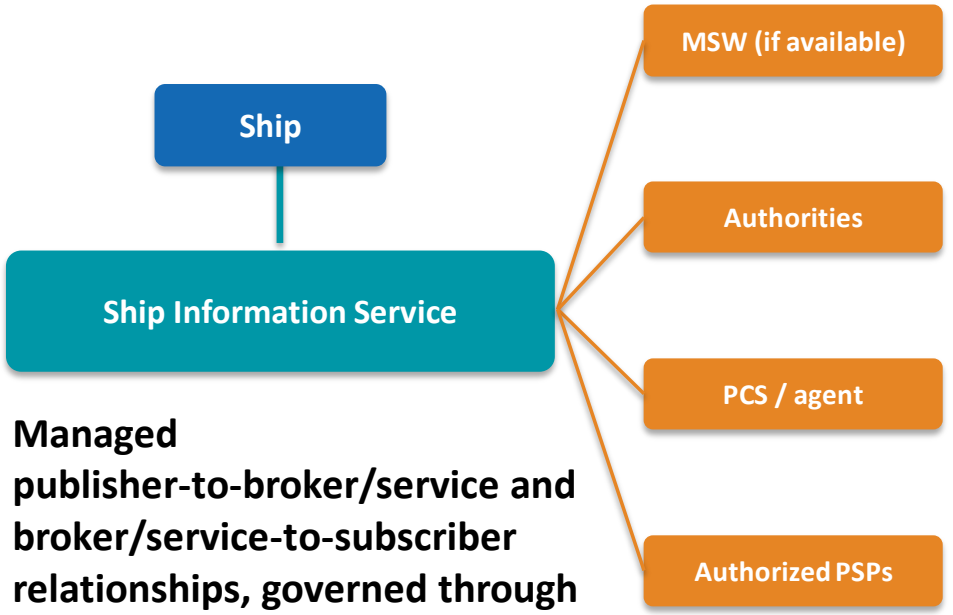
Each new recipient, interface and update creates additional connection, access-control and cybersecurity burden.

Point-to-point delivery

Many potential integrations, credentials, mappings, and update paths



Publish–Subscribe delivery



Managed publisher-to-broker/service and broker/service-to-subscriber relationships, governed through reusable policies

Scalability

One governed publication service can serve many authorized consumers without replicating bespoke ship-to-recipient integrations.

Cybersecurity

Identification, authorization, encryption, access logging and revocation can be managed centrally and consistently at the service boundary.

The port-call business process

A sequence of request, subscription, requirements, publication and authorized distribution.

1

Structured Port entry request

The vessel or its representative identifies the intended port call and invites the MSW to establish an authorized exchange.

2

Subscription and delegation

The MSW operator validates authority and establishes subscriptions for permitted government agencies and Port Service Providers.

3

Requirements and Deadlines

The MSW communicates the required datasets, business rules, deadlines, and formal-submission requirements.

4

Ship-side preparation and publication

Authorized ship/shore personnel reconcile, validate, approve, and publish current values with provenance and status

5

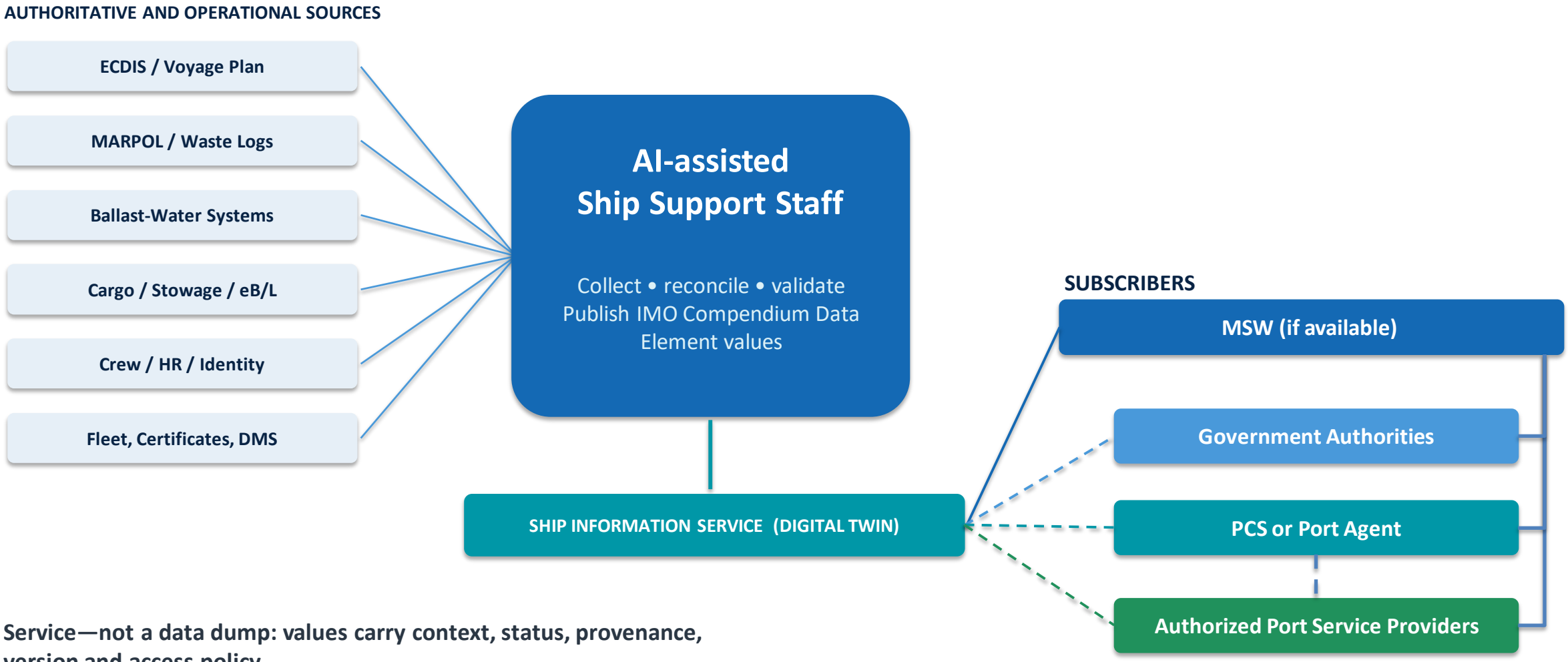
MSW receipt, regulatory processing, and controlled distribution

The MSW receives updates, performs applicable validation and acknowledgement, and distributes permitted views to authorized recipients.

The MSW (or the Port Authority) declares what is needed;
The Ship retains responsibility for the correct, current and authorized values it publishes.

The Ship Information Service: a governed publication layer

It is the governed service layer between operational source systems and port-call information consumers.



Service—not a data dump: values carry context, status, provenance, version and access policy.

What is published: values plus usable context

Automation works only when a subscriber can interpret, trust and handle the value correctly.

Identity & dataset context

- IMO vessel identifier and voyage/port-call reference
- Compendium Data Set and Data Element identifier
- Destination port and reporting deadline

Value & quality context

- Value, unit, code list and applicable period
- Source system or document reference
- Status: draft / verified / approved / superseded
- Version, timestamp and publisher identity

Access & handling context

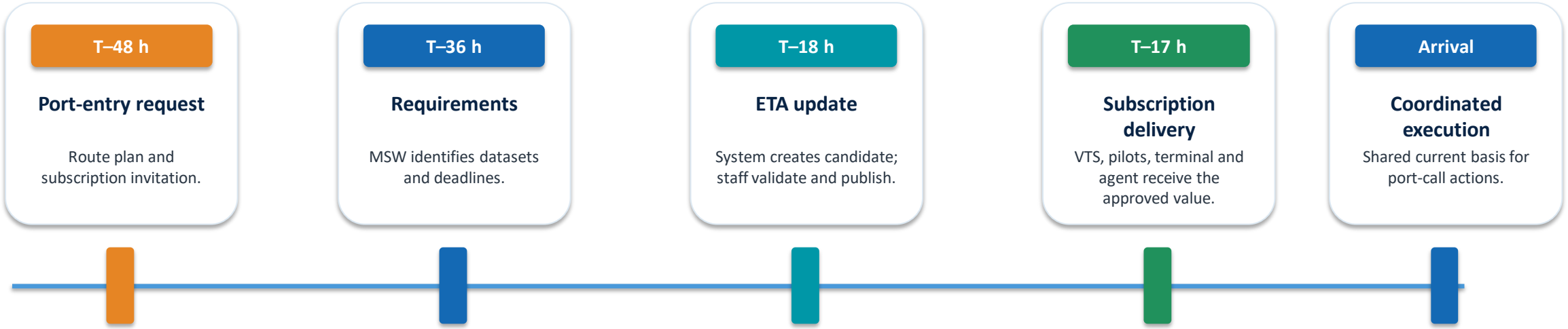
- Permitted recipients and purpose
- Personal or proprietary-data classification
- Retention, consent and contractual restrictions
- Audit record of publication and access

Publishing a value is an accountable operational act—not simply populating a form.

A subscriber needs to know not only the value, but whether it is draft, validated, approved, superseded, or legally submitted

ETA change: a simple example of automated reporting

The benefit comes from publishing a validated update once, then serving it securely to the subscribers that need it.



Each authorized subscriber receives the right update in a usable form at the right time—without sending every update to every party.

Operational result

Port side: less re-entry, fewer ad hoc messages, better MSW–VTS–pilot–terminal–agent coordination.
Ship side: fewer queries and re-submissions, less crew workload, Just-In-Time Arrival fuel savings.

Publish–Subscribe must be governed and cyber-resilient

Viable only with built-in contractual, identity, access and audit controls, e.g. MCP-based identity and service registry.

Ship Owner / Operator

Controls publication policy and allow-lists of contracted PSPs and authorized sensitive-data recipients.

SHIP INFORMATION SERVICE SUBSCRIPTION CONTRACT

Ship Owner/Operator ↔ MSW Operator

Scope • datasets • parties • service levels • liability for published values • legal status of submissions • confidentiality • termination

MSW Operator

Subscribes on behalf of participating government agencies and authorized port service providers.

Allow-lists — Only contracted Port Service Providers and expressly authorized recipients may access relevant values.

Least privilege — Share only data required for a defined regulatory or operational purpose.

Protection — Encrypt personal and proprietary data; apply handling and retention controls.

Auditability — Record subscriptions, versions, access, revocations and exceptions.

Candidate building blocks: IEC 63173-2 SECOM (subscribe/upload, secure ship–shore interfaces; designed for S-100 data products) with MCP identity and service registry – named as reference technologies in IMO draft S-100 connectivity guidance (NCSR 13); extending to Compendium datasets depends on IMO–IHO harmonization.

Call to action: complete the path to automated reporting

Compendium standardization + MSW consolidation + secure Publish–Subscribe exchange = scalable automated reporting.

The implementation priority

Enable Ship Support Staff to publish validated Compendium Data Element values through a secure Ship Information Service.

Start small

Pilot one corridor (e.g., Busan–Singapore) with a few high-value, changing datasets.

Define the controls

Map sources; establish roles, approvals, provenance, access policies and audit trails.

Implement subscriptions

Register each Ship Information Service in a federated MCP Maritime Service Registry (restricted visibility); configure MSW requirements, authorized subscribers, update delivery and revocation.

Measure and scale

Measure timeliness, completeness, re-entry avoided and operational confidence; then expand.

Standards gap: publish–subscribe mechanisms exist (ISO 18131:2025 broker architecture, SECOM, and a subscribe pattern in ISO 28005-1:2024), but no profile yet applies them to Compendium Data Sets with MSW authorization, value status and provenance.

The ship becomes an active, accountable publisher—not merely a reporting endpoint.

Discussion: What is the first port-call dataset your organization could make publishable, subscribable and auditable?

Sources: ISO 18131:2025 • IEC 63173-2 (SECOM) • ISO 28005-1:2024 • IMO Compendium. Gap statement is our reading of published scopes and contents.



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Backup: hosting options and automation trade-offs

Every option can publish the same Compendium data; the choice is about control, cost and integration effort.

Hosting options	Owner/operator hosted	Customizable open source e.g., MCP code	Vendor SaaS e.g., Kongsberg, LR OneOcean, Wärtsilä
Data control	Full; data stays in own systems	Full; owner or chosen host runs it	Set by contract and vendor cloud terms
Cost profile	High build cost; in-house staff	No licence fee; integration and support effort	Low upfront; recurring subscription
Source-system integration	Custom-built for own fleet systems	Self-built or community adapters	Often strong within vendor ecosystem
Lock-in and exit	Low	Low; depends on in-house skills	Moderate to high; check export and API terms
Best fit	Large fleets with IT capacity	Mid-size operators, ports, administrations	Fast, managed rollout

Automation levels	Manual / form-based	Semi-automated pre-filled, then reviewed	AI-assisted automated
How values are derived	Re-keyed from documents	Pre-filled from voyage, crew, cargo systems	Derived from sources; AI flags exceptions
Source-system integration	None	Selected interfaces	Broad, maintained interfaces
Cost and effort	Low tooling; high crew effort per call	Moderate tooling and crew effort	High investment; low effort per call
Main risk	Re-keying errors, stale values	Gaps where interfaces are missing	Integration upkeep; over-trust in AI

In every option and tier, authorized people approve published values. Automation pays back as port-call volume and reporting complexity grow.

Vendors listed alphabetically as examples, not endorsements. Source: Kongsberg Vessel Insight, LR OneOcean, Wärtsilä Navi-Port, MCP Consortium (GitHub)