EUROPEAN
UNION
AGENCY
FOR RAILWAYS

Making the railway system
work better for society.

Strategy

ICT Strategy 2022-2024

	Drafted by	*Reviewed by*	*Approved by*
Name	Israel OTURA GARCIA	Christopher CARR	Management Board
Position	Digital Transformation Coordinator	Head of EXO Unit	Management Board
Date	29/APR/2022	3/MAY/2022	23/JUN/2022
Signature			

120 Rue Marc Lefrancq | BP 20392 | FR-59307 Valenciennes Cedex   1 / 11
Tel. +33 (0)327 09 65 00 | era.europa.eu
Any printed copy is uncontrolled. The version in force is available on Agency's intranet.

1.   Context

The experience of the last years, operating as an Agency during the COVID pandemic, showed both the high quality of support the IT service provides to the agency and the need to evolve our systems as remote working and hybrid meetings become the new normal. This also underlines the need to digitalize our workflows and in doing so seek to extract any potential efficiencies that can help address the resource pressure faced by the Agency.

Currently, Agency´s information - and the data architecture where it is hosted - is of a heterogeneous nature. It is scattered all over Agency´s variety of information systems, excel files, documents, and brains (staff expert knowledge). Different operational organizational structures (Departments, Units, Teams) are responsible for most of the Operational IT systems (registers, OSS, CCM…), while the RSU Unit/ITFM Team is responsible for most of the Administrative IT systems (end-user software, server operating systems, server middleware, MS Project, SharePoint, Office365. Moreover, in most cases, rules governing our data assets are trapped in the application code of those different information systems the Agency handles.

This situation challenges Agency´s capability to manage adequately our information and to effectively extract knowledge out of the data we handle. In some cases, there is no clear documentation or awareness on how a modification on a specific data asset may impact another data asset. This situation may lead to a lack of consistency in data. Inconsistency in data means poor information. This is effectively an obstacle to turn the Agency in a data driven organization- an organization where the decisions and processes rely on data.

During the last two years, Agency has raised inhouse awareness about the value of the data we host and the importance of data management: trainings, workshops, pilots, webinars, rules, a specific data information and governance team together with a data governance steering committee in place.

There is still a long path ahead to update our processes and procedures with a digital data centric perspective. Along that path other considerations shall be taken, related to security, performance and environmental awareness.

2.   Scope

The Agency acknowledges data processing as the main driver for the ICT strategy, thus it is considered as the first influencer of its scope. Nevertheless, the Data and Digitalization roadmap is kept separate from the ICT Strategy with the clear intention to create a future where the approach to data is technology-agnostic, and aligned with the wider initiatives on European DataSpaces.

The following are in scope of Agency's ICT Strategy:

› **IT Systems** – Applications, programs and tools supporting the Agency activities. Can be grouped in:
   o **Support/Administrative IT** – provisioning office automation and end-user computing capabilities. Administrative IT systems examples are Microsoft Office, Intranet, Microsoft Project, SYSPER, SUMMA, JSIS/RCAM…
   o **Business/Operational IT** – provisioning IT services and capabilities directly related to and implementing the mandate of the Agency. Operational IT systems examples are each of the registers, the OSS, the CCM…
› **ICT infrastructure** – provision of computing, storage and networking capabilities. Can be grouped in:
   o **On-premises –** implemented by physical components located in the Agency datacentre (or rented facilities). These are managed and operated by the Agency at every level (infrastructure, platform and application). ICT infrastructure includes servers, network equipment, storage devices, laptop computers, printers, desktop computers, mobile phones…
   o **Cloud –** virtual on-demand services provided, managed and operated by third parties. Depending on the level where the management and operation is trusted to the third party, these can be

120 Rue Marc Lefrancq | BP 20392 | FR-59307 Valenciennes Cedex
Tel. +33 (0)327 09 65 00 | era.europa.eu
Any printed copy is uncontrolled. The version in force is available on Agency's intranet.

2 / 11

considered as IaaS (Infrastructure as a Service), PaaS (Platform as a Service) or SaaS (Software as a Service).

The strategy depicted in this document covers both Administrative/Support IT (systems such as SYSPER, SUMMA, TIMA, Intranet and services such as internet access, email, end-user computing…) and Operational/Business IT (including the registers, OSS, CCM, the Extranet, etc…).

3. Vision

The Digital revolution has opened up significant opportunities and puts data as a key strategic enabler to the effective and efficient functioning of the Single European Railway Area. With this development come new challenges, not least how to ensure that data does not become the new barrier after the Agency has successfully addressed many of the technical and operational barriers.

The Agency can play a central role in supporting a successful railway area by acting as the EU Railway Information Hub and the EU railway data authority, in particular for the data related to safety and interoperability. Providing a central data hub that uses open standards and protocols as the point of entry to access railway data, supporting innovation and operation.

To achieve this the Agency will migrate to a Data Centric model where citizens, companies and institutions are guaranteed connected, meaningful data independently of the tools, applications or systems used to process it. The Agency believes that Applications are ephemeral and data is the enduring asset. To support this vision the Agency will apply 7 strategic principles;

Governed	The Agency will establish a Data and IT Steering Committee, which will serve as an advisory body to the decision makers and will guarantee the coordination of the transformation actions leading to the materialization of this vision.
Self-describing, Machine Readable	Rail data, as a fundamental part supporting intermodal transport data and related knowledge, will be self-describing not requiring further interpretation nor translations from proprietary formats. One of the main outcomes will be the structuration of that information as machine-readable instruments, which can be directly consumed by automated systems, serving as an enabler for business-to-business data exchanges and founding stone to the digital railway.
FAIR (Findable, Accessible, Interoperable, Reusable)	All the data processed by the Agency will be migrated from siloed to connected data, and to reuse and connect it in accordance with the FAIR principles based on linked data. The data architecture together with the systems design, contribute to guarantee the data quality, avoiding duplication and inconsistencies. The Agency will adopt an evolvable ERA core ontology (by reusing and/or alignment of existent ontologies or by creating them - transforming current data models into semantic models). Legacy datasets will be mapped/annotated in accordance with this ontology. Data storage of the annotated data will be in the ERA knowledge graph.
Independent	The Agency IT infrastructure supporting IT solutions is independent. Location independency is implemented by virtualization and cloud, while IT systems follow open standards, technologies and tools. Those ensure data portability and vendor and technology independence. IT solutions will allow stakeholders and staff to run any interaction with the Agency over the internet, by using

Any printed copy is uncontrolled. The version in force is available on Agency's intranet.

	only a web browser. They will not be bound to physical locations or specific devices, tools, or operating systems.
Reuse-Buy-Build	When identifying IT tools for implementing administrative IT solutions, the Agency privileges those already made available by other EUIBAs to benefit from synergies. If no solutions are already made available by other EUIBAs, the Agency will exercise market research to identify COTS (Commercial off the shelf) solutions which would satisfy the needs. If no suitable tools are already available by other EUIBAs or in the market, the Agency will develop its own and make it available to other EUIBAs. Software solutions developed by the Agency will be released, as much as possible, as open-source solutions, making source code available and allowing to benefit from the community experience and knowledge by means of independent contributions and improvements
Once Only/Single Source of Truth	Agency adopts the once-only principle an e-government concept that aims to ensure that citizens, institutions and companies as data providers must provide information to the authorities and administrations only once. For its own internal data the Agency will work with Master/Reference Data to avoid multiple sources of same/similar data. Access is set according to business needs.
Secure Data	Access to and security of the data is a responsibility of the data layer, and not managed by applications. Personal data is managed on a privacy by design principle.

4.   Objectives and expected outcomes

To materialize its vision and considering the context, the Agency has set **5 objectives**, with specific outcome indicators and targets for the period 2022-2024

Objective 1	Increase **cost-effectiveness** of the Agency's ICT
Outcome indicator and target	ICT cost effectiveness (assets and services) is ranked best in class compared with other Agencies by 2024
Strategic Focus	› ICT shall be driven by business needs and requirements › ICT response shall be proportionate to the business needs. Under- and over-responses in terms of ICT complexity shall be avoided › ICT shall be proactive in presenting potential innovative solutions to business needs, without considering innovation and technology as a driver for the needs › ICT shall build on best practices from similar organisations and shall take stock of standardisation and economies of scale › The Agency shall better exploit the opportunity to resort to ICT solutions already provided by other organisations (e.g. SYSPER provided by the EC etc.), which can prove more cost-effective compared to the current setting › The Agency shall reduce to a minimum the number of systems hosted in-house and the physical infrastructure, considering external datacentres and cloud services

120 Rue Marc Lefrancq | BP 20392 | FR-59307 Valenciennes Cedex
Tel. +33 (0)327 09 65 00 | era.europa.eu
Any printed copy is uncontrolled. The version in force is available on Agency's intranet.

4 / 11

	› The Agency's ICT shall avoid vendor lock-in › The rationalisation of the Agency's ICT shall be based on a data centric approach and a once-only principle, avoiding overlaps and gaps and following a common framework (ICT architecture)

Objective 2	Maintain **reliability** of Agency's ICT
Outcome indicator and target	Reliability indicator stable/increasing from 2022 to 2024
Strategic Focus	› The Agency's legal obligations which rely directly on the availability of ICT shall be dully fulfilled (e.g. availability of OSS), thus preventing reputational and financial damages › The Agency shall also strive to meet stakeholders' expectations › The reliability of Agency's ICT services shall be continuously supported by a set of competences and skills. The latter shall be regularly updated and validated in order to keep the pace with the overall ICT trends

Objective 3	Maintain **security** of Agency's ICT
Outcome indicator with target	Security indicator stable/increasing from 2022 to 2024
Strategic Focus	› In the new Agency landscape, the processing of sensitive commercial information, as well as the obligations related to personal data protection, require a risk-based approach to assure the confidentiality, the integrity and the availability of the information assets processed by ICT systems. › A proper ICT environment is based on the identification of information assets and their security requirements, a risk analysis on the requirements and the elaboration of security plans including controls to mitigate the risks to acceptable levels. › Changes to ICT systems processing information shall include a prior impact assessment. › A zero-trust policy that ensures every entity is identified and access is granted on the basis of that identity shall be implemented allowing a full migration to access based on identity not location and reflecting role/profile based authorisation.

Objective 4	Improve **user efficiency** through ICT
Outcome indicator with target	Increasing contribution of ICT for user efficiency from 2022 to 2024
Strategic Focus	› It is necessary to identify, evaluate and prioritise those ICT developments with a high impact on the staff efficiency. This set of actions will indirectly lead to better user experience, higher productivity and better working environment › Increasingly internal data is used to measure progress, performance and to inform decision making. This data shall be easy to share between different platforms, be consistent between the different Agency tools and follow a once-only principle › The IT tools shall support automation and drive compliance, supporting the reduction of human error

	› Digitalise the Agency's processes/workflows › The Agency's ICT shall aim at strengthening the capabilities for videoconferencing in order to satisfy the needs of its stakeholders (cost and time saving related to meeting participation and Agency staff missions). This is also likely to contribute to an increased and balanced stakeholder participation in Agency's activities.

Objective 5	Establish an effectively governed and managed data architecture
Outcome indicator with target	The Agency has a documented and managed data architecture
Strategic Focus	› The Agency has a data architecture today but it is important to formally document it and to then identify if there are any opportunities for optimisation › Data assets need to be clearly identified and with that the data stewards. › The agency shall care about the data concepts it uses to ensure internal and external consistency of approach › Changes or evolution of the architecture shall be clearly governed to ensure that any changes are understood and in line with the Agency approach and then documented so that there is always an accurate understanding of architecture we have.

5. Strategic Actions over time 2022-2024

5.1. Increase cost-effectiveness of the Agency's ICT ❶
Target: ICT cost effectiveness (assets and services) is ranked best in class compared with other Agencies by 2024

Action	Output indicator with target

1. Define baseline for ICT costs (4Q2022)	› Inventory of ICT assets set up by end 2022 with information regarding:
	  o services supported by each asset
	  o entry value for each asset (CAPEX) and recurring costs (OPEX)
	  o life cycle
	  o residual value
	  o staff costs linked to the assets' life cycle
	› Catalogue of ICT services set up by end 2022 with information regarding:
	  o the ICT assets supporting the service
	  o the detailed service definition
	  o the service level agreements
	  o the cost of the service
	  o staff costs linked to the services life cycle

2. Benchmarking of the Agency's ICT against other Agencies and equivalent public bodies. (4Q2023)	› *Establish a methodology to allow level playing field comparison across Agencies and comparable public bodies that can be adopted by the Agency Management Team. (4Q2022)* › *Identify the Agency ranking and, if any, delta between position and best in class. (2Q2023)* › *Develop an action plan to be included in the IT service plan to address the delta and support achievement of the target. [Noting if we rank best in class this action is not needed] (4Q2023)*

120 Rue Marc Lefrancq | BP 20392 | FR-59307 Valenciennes Cedex
Tel. +33 (0)327 09 65 00 | era.europa.eu

6 / 11

Any printed copy is uncontrolled. The version in force is available on Agency's intranet.

5.2. Maintain reliability of Agency's ICT ②
Target: Reliability indicator stable/increasing from 2022 to 2024

Action	Output indicator with target
1. Define baseline for the reliability indicator (4Q2022)	Clear methodology of calculation for the reliability indicator and baseline value for 2022, based on satisfaction surveys to internal and external stakeholders (the systems do what they are expected to do) and availability reports (the systems are available when they are expected to be).
2. Update IMS processes, if necessary (2Q2023)	Formalised processes for: ICT Services Catalogue Management; Service Level Management; Incident Management; Problem Management; Change Management; Release Management; Knowledge Base Management; Availability Management; Capacity Management and Business Continuity. Those processes shall be aligned to industry standards and/or best practices.
3. Maintain reliability of ICT assets and services (2022-2024)	Stable/increasing trend of the reliability indicator compared to the baseline

5.3. Maintain security of Agency's ICT ❸
Target: Security indicator stable/increasing from 2022 to 2024

Action	Output indicator with target
1. Define baseline for the security indicator (4Q2022)	Clear methodology of calculation for the security indicator and baseline value for 2022.
2. Implement SECURIS@ERA provisions (2Q2023)	› information assets and their security requirements identified › risk analysis on the requirements performed › security plans developed and implemented, including controls to mitigate the risks to acceptable levels
3. Maintain security of ICT assets and services (2022-2024)	Stable/increasing trend of the security indicator compared to the baseline

5.4. Improve user efficiency through ICT ④
Target: Increasing contribution of ICT for user efficiency from 2022 to 2024

Action	Output indicator with target
1. Identify ICT services which require increased user efficiency (4Q2022)	Top 10 ICT services which need optimisation from the users' perspective (including internal and external users), based on digitalization and controls automation.
2. Increased user group consultation in the design and configuration of ICT services (1Q2023)	At least 80% of the ICT developments consult the identified user groups
3. Migrate to truly digital workflows & processes (2022-2024)	Identify top 8 processes that would benefit from digitalisation (2022) and digitalise them by end 2024 [Digitalisation is not meant to mean electronic sharing/exchange of word documents or pdf]
4. Implement software controls in tools that we use for	Control automation: Identify those tools used to support approval/permissioning and which generate current non-conformities.

120 Rue Marc Lefrancq | BP 20392 | FR-59307 Valenciennes Cedex
Tel. +33 (0)327 09 65 00 | era.europa.eu
Any printed copy is uncontrolled. The version in force is available on Agency's intranet.

7 / 11

permissioning/approving. (2022-2024)	Build in software controls that reduce human error and require clear over-ride with ex-ante non-conformity to unlock approval › *Solutions identified and implemented*
5. Increased ICT support for teleconferencing for working parties (2022-2024)	Solutions identified and implemented that support Hybrid meetings and fully remote meetings (including enhanced tools for brainstorming and voting (open/secret))

5.5. Establish an effectively governed and managed data architecture ⑤
The Agency has a documented and managed data architecture (2022)

Project/service	Output indicator with target
1. Establish Agency Data Architecture and implement Data Governance system	› *Extend scope of data governance steering committee to cover all Agency data (2Q2022)* › *Establish data governance processes under the IMS (2Q2022)* › *Source contracted support to document current architecture and identify any clear optimisation opportunities. (4Q2022) (Complete by 4Q2023)* › *Review and report on data governance steering committee by end 2022*
2. Identify the value of structured and unstructured Agency data (4Q2024)	› *From the data architecture documentation exercise identify any unstructured data and propose an action plan to either structure it or archive and support access with tools [e.g.data-mining]*

6. Implementation plan, programming and progress reporting

The implementation of the strategic actions proposed in section 5 Strategic Actions over time 2022-2024 shall result in a number of programs which will include tactical initiatives in the form of projects, services or initiatives (depending on their individual specifications).
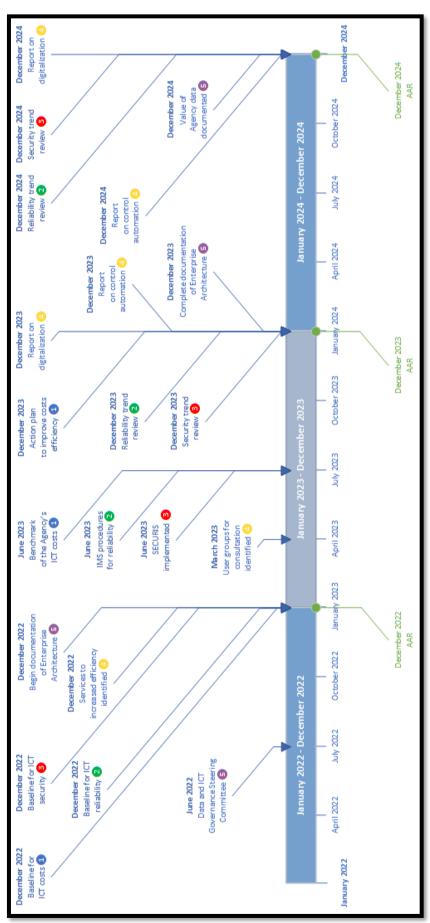
Those programs and the underlying projects/services/initiatives shall be part of SPD, to ensure that adequate priority, budget and resources are allocated to each of them in the overall context of the Agency activity.

In the same line, their progress shall be reported monthly to the Management Team by means of the PPS dashboards and yearly as part of the Annual Activity Report.

The timeline below is a rough estimation for different milestones related to the strategic actions. Each milestone is linked to its related strategic action through a colored/numbered icon, for easy reference.[1]

---

[1] Colors are randomly chosen and do not have an implied signification.

120 Rue Marc Lefrancq | BP 20392 | FR-59307 Valenciennes Cedex

Tel. +33 (0)327 09 65 00 | era.europa.eu

Any printed copy is uncontrolled. The version in force is available on Agency's intranet.

8 / 11

120 Rue Marc Lefrancq | BP 20392 | FR-59307 Valenciennes Cedex
Tel. +33 (0)327 09 65 00 | era.europa.eu

9 / 11

Any printed copy is uncontrolled. The version in force is available on Agency's intranet.

7. Annex I: Proposal for tactical actions

This annex provides a list of tactical actions which completely or partially implement and support the strategical actions detailed in previous sections.

Due to the nature of the actions themselves, their planification depends on the implementer, his/her calendar and the budget, resources and skills available, which will be allocated during the different arbitration sessions based on the Agency priorities.

1. *Organization*
   a. *Establish a Data & IT Governance Steering Committee (DITGOV)(EXO)*
      The DITGOV will provide coordination between the different organizational structures in the Agency dealing with data and IT initiatives, to ensure the benefits of potential synergies and minimize the impact of undesirable side-effects. DITGOV will guarantee the alignment of any data or IT initiatives with the ICT Strategy and the Data and Digitialization Strategy by implementing a change management procedure.
   b. *Document and formalize the Enterprise Architecture (ENTARC)(EXO)*
      The ENTARC will serve as single source of reference for the integration and development of new systems, ensuring their standardization and alignment with the current ecosystem.
   c. *Develop and implement an Information Security Management System (SECURIS)(EXO)*
      SECURIS guarantees the right balance between security needs and security measures by developing security plans for each information asset following a risk-based approach.
2. *Cultural*
   a. *Enforce a data-first approach to ICT solutions identification (EXO)*
      Develop and/or modify procedures and working instructions related to ICT solutions commissioning by setting the data as the focal point to support the business needs.
   b. *Enforce a think-digital approach to process management (both administrative and operational) (EXO)*
      Develop and/or modify procedures and working instructions related to process and procedure developments to be digital in nature, instead of paper based.
   c. *Enforce an open-everything approach to ICT solutions identification (RSU, AAM, PAD, RSYS, EXO)*
      Develop and/or modify procedures and working instructions related to ICT solutions commissioning to privilege the choice of open-source tools and applications, implementing 0open-standards and promoting open-data.
   d. *Enforce a cloud-first approach to ICT solutions design (RSU, AAM, PAD, RSYS, EXO)*
      Develop and/or modify procedures and working instructions related to ICT solutions commissioning to privilege cloud-based ones.
3. *ICT Systems*
   a. *Modernization of operational IT systems (RSU, AAM, PAD, RSYS, EXO)*
      Develop new systems and upgrade existing ones to implement the different principles mentioned in the ICT strategy (data-first, cloud-first, FAIR, only-once/single-source-of-truth,…) and to fully benefit of digital technologies, including as examples cloud, open-everything, zero-trust, paper-less and low-code solutions.
   b. *Provision of low-code Business Process Management solution (RSU)*
      Provide a BPM low-code solution enabling every staff member the implementation of her/his own digital workflows.
   c. *Evaluate the EaaS feasibility (Everything-as-a-Service) (RSU)*

120 Rue Marc Lefrancq | BP 20392 | FR-59307 Valenciennes Cedex
Tel. +33 (0)327 09 65 00 | era.europa.eu
Any printed copy is uncontrolled. The version in force is available on Agency's intranet.

10 / 11

Undertake a risk, impact and economic analysis on transitioning different ICT Systems and infrastructures as services (e.g. Network as a service, Support as a service, etc…).

4. *ICT Services*
   a. *Rationalization of current ICT Services (RSU, AAM, PAD, RSYS, EXO)*
      Identify the different ICT services provided, both internally and externally, perform a formal evaluation of their priority and performance and establish a benchmark for comparison versus other EUIBAs and external providers. Reduce and optimize the ICT Services according to the outcome of the comparison.

5. *ICT Infrastructure*
   a. *Migration to a Cloud-only infrastructure architecture (RSU)*
      Benefit of the workplace independency and the increased security and availability provided by cloud technologies by migrating all the infrastructures from on-premises to the Cloud.

6. *Information and IT Security*
   a. *Implementation of SECURIS (RSU, AAM, PAD, RSYS, EXO)*
      Take a formal risk-based approach to rationalize security measures and investments by implementing SECURIS.

7. *Human Resources*
   a. *Identification of digital competencies requirements per role (RSU)*
      Determine and document in the competencies' framework the necessary digital competencies for each role and function within the Agency.
   b. *Introduction of digital competencies requirements in selection procedures (RSU)*
      Modify the recruitment procedures to include the formal assessment and evaluation of the digital competencies required for each role and function.
   c. *Development of training plans for digital competencies (RSU)*
      For each staff member, determine the gap between her/his digital competencies and those required for her/his role or function and develop training plans to cover that gap.