



*"With the financial support of the Prevention of and Fight against Crime Programme
European Commission - Directorate-General Home Affairs"*



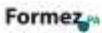
Protection System for Cultural Heritage



Psyche will be an **independent subsystem** that manages:

- **communication**
- **persistence**
- **validation**
- **synchronization**

of the information entered by the member states with the INTERPOL database.



According to information received, the Interpol database consists of a set of applications built with different technologies and languages (PL / SQL, Pro * C, Visual Basic, etc. ..) that currently rely on an Oracle DB 10g.

The heterogeneous nature of such a database could make it difficult to integrate the software modules provided in the PSYCHE project with the systems currently in use at the Interpol data center and thus, to guarantee an optimal design, development and maintenance of the entire system, it is considered desirable the creation of a separate and independent subsystem

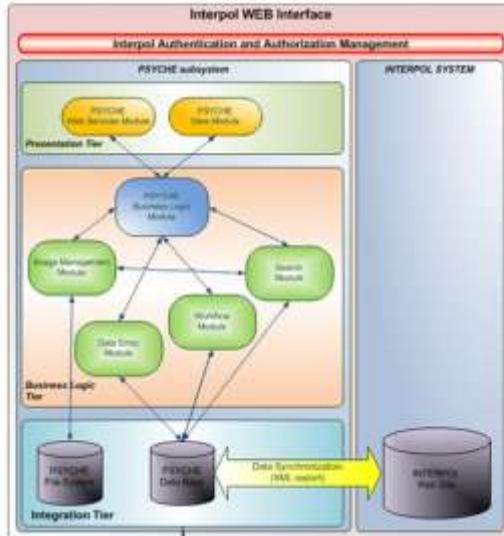
The PSYCHE subsystem will provide the following features:

- records management, i.e. insert, modify (eg change the status of an asset from “to be found” to “recovered”), delete the information on stolen artwork and associated events;
- validation, investigative and quality check of exchanged information;
- synchronization of its own database with the Interpol’s one. A suitable batch process will sync the two databases. The information will be permanently recorded in the INTERPOL database and will therefore be searchable by other member states, only after having undergone the process of validation;
- search for stolen artworks included in the database with both traditional research methods based on textual fields with the aid of visual search.

The INTERPOL web site (including application, presentation and management) will be under IPSG responsibility; it is not part of the scope of the PSYCHE project.

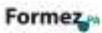
PSYCHE will include an interface allowing for regular data downloading from PSYCHE to the INTERPOL web site, based on XML

Architecture overview



Web application based on the MVC pattern:

- **Presentation tier:** expose web services and graphic user interface (GUI)
- **Business logic:** realize all the system functionalities
- **Integration tier:** store and synch the data with INTERPOL system

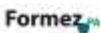


Open Source Architecture based on Java paradigm and MySQL database.

System connections

The project provides three alternative scenarios:

- **No connection** between Law Enforcement Agency (LEA) and NCB: **standalone application** will enable asynchronous channel
- **VPN over internet** between LEA and NCB: **web application** will be available for the users
- **Dedicated network** connection between LEA and NCB (I-24/7): **web application** and **web services** will be available for the users



In order to prevent any security, availability and connection issue the PSYCHE subsystem will be configured within INTERPOL infrastructure.

For all member states, the access to PSYCHE will be granted by the network connection between NCB and INTERPOL: each NCB has a dedicated network (I24/7) that can be used by member states, under National Security Officer policies, to reach PSYCHE subsystem.

In order to allow this communications, each member states must be able to connect to the NCB network. It could be possible three different scenario:

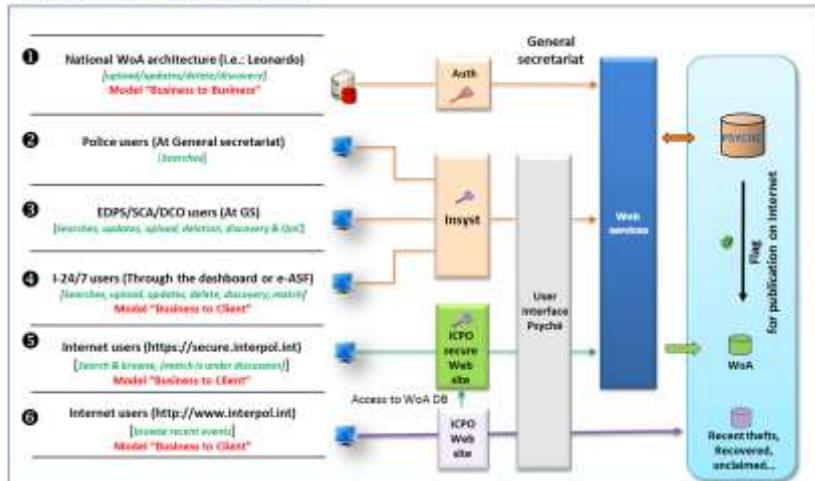
- No connection between Law Enforcement Agency (LEA) and NCB
- Connection between LEA and NCB through a VPN over internet
- Dedicated network connection between LEA and NCB

In the first scenario, will be evaluated the possibility to create a standalone application that enable LEA users to operate through asynchronous channel (like email) for exchanging formatted message that can be imported by the NCB users in the subsystem.

In the two other scenarios, authorized LEA users can access the I24/7 network to connect and operate on PSYCHE subsystem. In case of VPN over internet configuration, the credentials and user account will be managed by a dedicated NCB user.

Identity access management

Six different type of users:



INTERPOL is providing an IAM (Identity Access Management so called INSYST) for all INTERPOL applications. PSYCHE will be able to benefit from this IAM. This implies that Carabinieri will not need to develop tools and interfaces for User Management, Password Management and Management of Access Rights. INTERPOL provides this tool in high availability mode. The NSO will be responsible for creating and updating user accounts, and for assigning Roles.

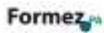
- The **National WoA architectures (N°1)** represents a user of the member countries that uses the GUI of his system, not PSYCHE user interface, to operate and exchange data with PSYCHE DB. In this case, the national WoA architecture communicates with PSYCHE using B2B interface. This is available only for the member countries that access with the I-24/7 within NCB network.
- Access to PSYCHE data by **users located within General secretariat (N°2 and n°3)**, within INTERPOL infrastructure, will be provided through a GUI or a free text field in which the user in charge of data entry should input the PSYCHE reference code of the interesting WoA.
- **I-24/7 users (N°4)** are all law enforcement users that have been authorized by their National Security Officer (NSO) within their respective NCBs to access the I-24/7 network and its information (accesses are provided on an ad-hoc basis by the NSOs). For PSYCHE this implies for example that the I-24/7 users will have access to the formatted message to upload, update and delete information. They will also have access to the PSYCHE database to perform searches and matching.
- **Internet users (N°5 and N°6)** are most commonly civilians (museum curators,

students, journalists, auction houses, etc) that will have access to the PSYCHE database via INTERPOL web site (<https://www.secure.interpol.int>). They will only be able to perform searches and browsing on the database, but no upload, update or deletion by Internet users will be possible. The possibility for them to match and inform the responsible NCB of the matching is still under discussion.

System actors

The relevant actors that interact with the system are:

- **B2B client (n°1)**
LEA software system interacting through Web Services (e.g. CCTPC Leonardo)
- **IPSG users (n°2)**
EDPS
- **IPSG (WoA team) user (n°3)**
EDPS/SCA/DCO
- **B2C users (n°4)**
Law Enforcement agencies of member states (e.g. CCTPC user)
- **NCB user (n°4)**
National Central Bureau of member states (e.g. NCB Rome)
- **Web site users (n°5 and N°6)**
Internet users
- **INTERPOL Synchronization**
Data downloading from PSYCHE to INTERPOL web site for publication on Internet
- **Administrator**

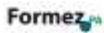


Data validation

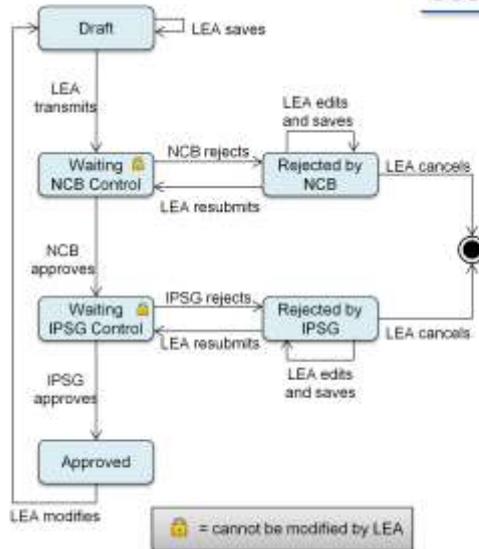
Independently of the access type (also for B2B communication), the information entered by all authorized users in member states **will not be automatically written in the PSYCHE database.** Instead, it will reside in a **staging area awaiting validation.**

The system will provides two levels of validation:

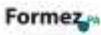
- **Police/Investigative check;**
- **Quality check.**



Use case: Data Entry / Update



The LEA user **enters** or **modifies** the data of the stolen artwork and submits them to the control process.

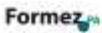
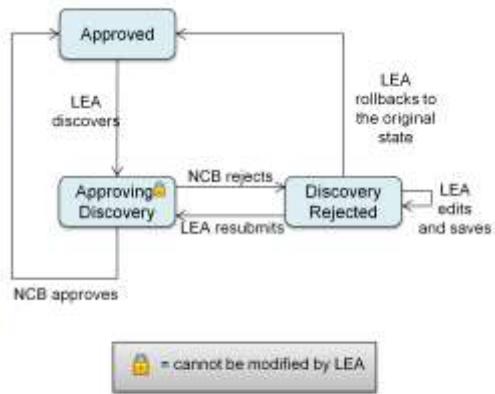


1. LEA user insert/modify an event and work of art and submit it to get approval. He receives a receipt containing the PSYCHE Reference. Data provided by LEA user is correctly added to the police control queue (and cannot be modified until the process is over)
2. NCB user can modify, approve and reject the entry and the system notify the entry's owner via email. Data is correctly added to the quality control queue. An ICIS message containing the PSYCHE Reference Code is correctly generated
3. IPSP user can modify, approve and reject the entry and the system notify the entry's owner via email. Data is correctly saved in PSYCHE and becomes available for search and modifications.

Use case: Discover

A **discover** event modify the "status" of the record relative to a stolen artwork.

In this case a quality control of the data is not necessary since the change is not related to the information about the artwork, previously validated, but only to its condition.

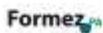
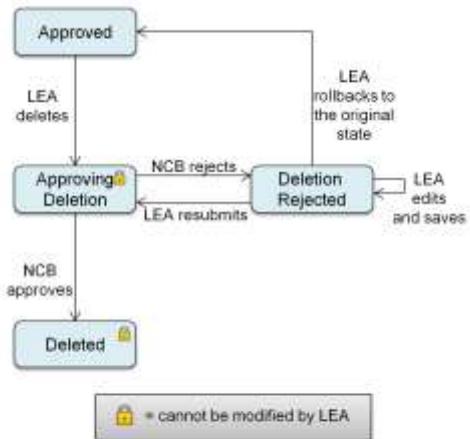


1. LEA user searches and selects the data record pertaining to the stolen artwork of which he needs to change the "status" attribute, and submits the change to the inspection process
2. PSYCHE updates the state of the record to "Approving Discovery"
3. PSYCHE notifies the interested NCB users (those in the same Country) that there is data waiting for police control
4. NCB user checks the status change request and approves (or reject)
5. PSYCHE persists the changed record (that becomes "Approved") in the database
6. PSYCHE sends a specific alert (e.g. by email) to the INTERPOL database management staff to notify the data update

Use case: Delete

PSYCHE record can be **deleted**.

In this case a quality control of the data is not necessary since the change is not related to the information about the artwork, previously validated, but only to its condition



1. LEA user searches and selects the data record he wants to remove, and submits the removal to the inspection process
2. PSYCHE updates the state of the record to “Approving Deletion”
3. PSYCHE notifies the interested NCB users (those in the same Country) that there is data waiting for police control
4. NCB user checks the removal request and approves
5. PSYCHE removes the record from the database
6. PSYCHE sends a specific alert (e.g. by email) to the INTERPOL database management staff to notify the data update

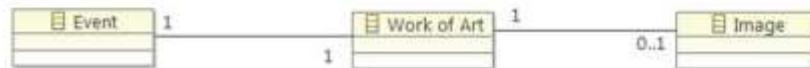


The graphical user's interface (GUI) will be a light web application developed in Java technology; the graphical chart that shall apply to all INTERPOL web sites will be forwarded to the Carabinieri, so that PSYCHE's GUI can be built accordingly.

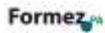
Web Services to interoperate with the system:

- data entry
- search queries
- Results

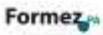
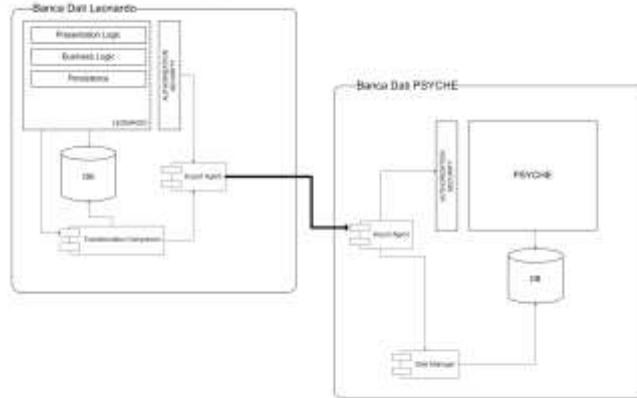
and exchange the structured information with **XSD (XML Schema Definition)**



Linking Italian “Leonardo” and INTERPOL Stolen WOA Databases will be set up a **standard** to the future integration of other national Databases to the Database managed by the IPSCG



Inserire schema web services



Images comparison tool

To enrich the **INTERPOL WOA DB** search features based on textual data by a specific automatic software to:

- Find images that are exactly the same or have been edited
- Find photographs taken of the same visual content
- Find images that are visually similar in shape and color
- Identify fine differences by comparing pairs of images



[Visual search: demo of italian woa db](#)

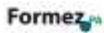


 Reply
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Sharing the results of the project

- Development of interactive **e-learning** modules explaining how to use the new services and tools of the INTERPOL Stolen WOA DB
- Delivering of national/regional **training sessions** to the Partner Countries
- Realizing a **Handbook** to provide information and best practices to better curb illicit trafficking of cultural heritage





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