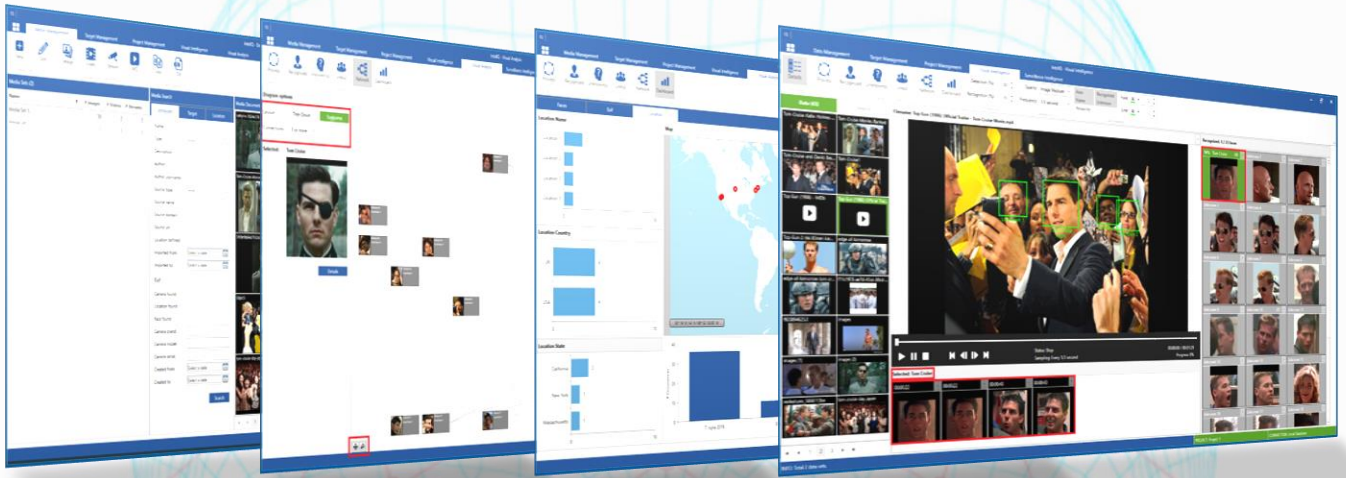


Facial Recognition Visual Intelligence Solution for strategic and tactical application



IQ Media Management module / Target Management module / Project Management module / Visual Intelligence module / Visual Analysis module / Surveillance Intelligence module / GIS & SNA subsystems

KEY FEATURES

Server / Client / Studio / WEB / Mobile application system architecture

Artificial Intelligence algorithms for Biometric Detection, Identification and facial recognition

Real-time Alerting subsystem and actions (pre-defined or ad-hoc defined)

Functionality of analytical processing of faces collected from group of Images and videos

Target Profiling functionality for creating a gallery of images of targeted persons for facial recognition purposes with manual and automated data entry of all master data as Name, Surname, Additional Description, Age, Gender, Priority etc.

Social Network link Analysis subsystem - SNA with the functionality for visualization of the complex social relationships detected and defined by IntellQ VIS link analysis engine and enriched by data collected from open SN sources

Geographic Information subsystem (GIS) with the ability to display the locations on the map for all detected, recognized or anyhow associated Images (EXIF supported)

Project Collaboration functionality for flexible two-way communication between all project stakeholders (exchange of project tasks and information of importance related to relevant investigation cases)

Project Management Module for designing and managing of the investigation cases

Flexible administration module for user rights and user authorisations

IntellQ VIS system

IntellQ Visual Intelligence Solution (here and after also IntellQ VIS) is specially designed for integration with existing video surveillance systems, image and video repositories as well as a quick and efficient tactical Facial Recognition (FR) solution to capture, find and recognize faces from surveillance photos and videos of any kind. While detecting faces those are immediately compared with a list of targeted and tracked individuals from a target database. When the system identifies a face of interest (target), it issues a warning so that appropriate measures can be taken quickly in order to reduce the risk of public and national security threats and to take the security and business procedures defined by the Security staff and/or Law Enforcement Agencies.

Independent testing by our users and other relevant FR authorities confirms that **IntellQ VIS Artificial Intelligence (AI) system technology** with applied advanced Machine Learning algorithms implemented inside **IntellQ VIS Machine Learning Engine** provide the fastest and most accurate syntax and facial recognition verification and is most resistant to age variation, race variation, angle of view, and person's face coverage.

IntellQ VIS Machine Learning Engine uses highly complex computations to achieve the best possible match of all face(s) (enrolled under a "Target") against data defined in "Media Sets".

Versatility of Architecture: Server / Client / Studio / WEB / Mobile device

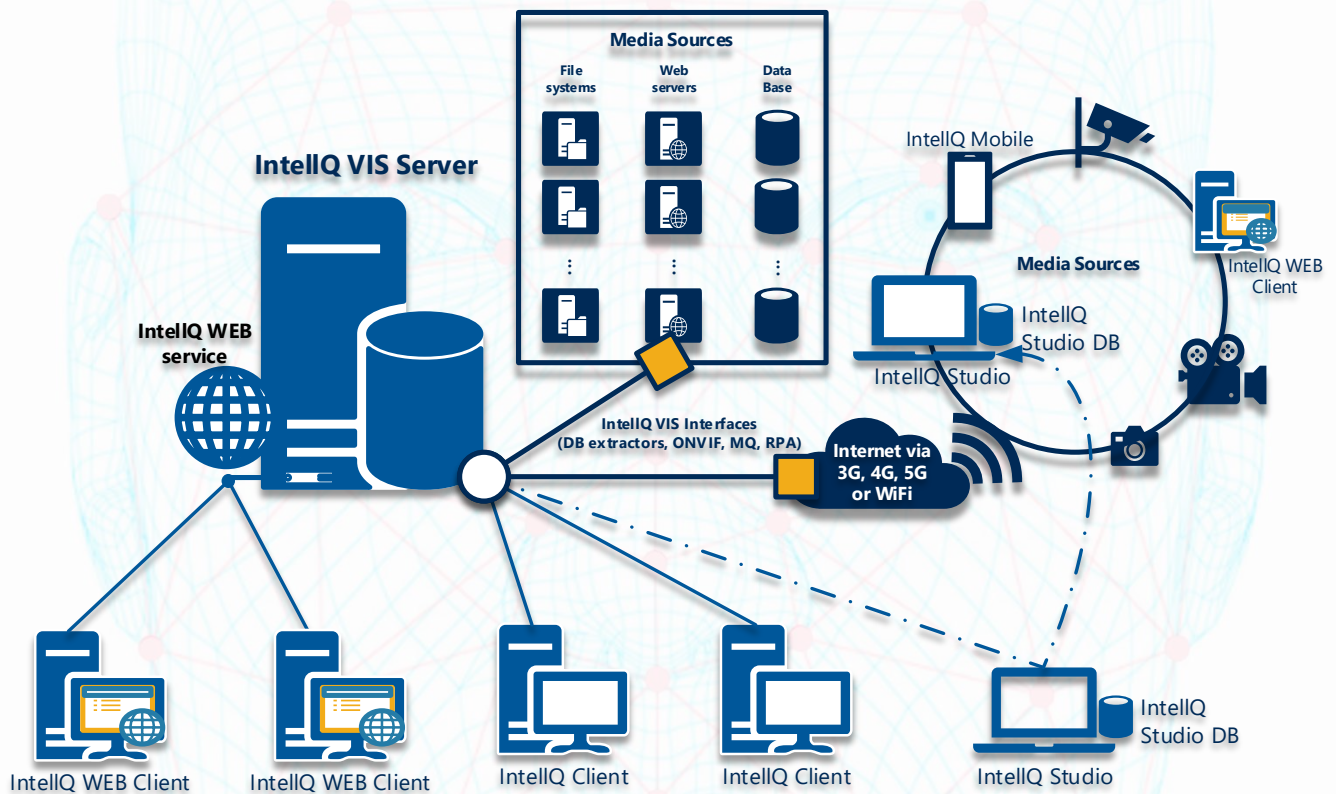


Figure 1: IntellQ Architecture: Server / Client / Studio / WEB / Mobile device

IntellQ Architecture

IntellQ VIS Server, Client and Studio are in fact the same software. Diversity is defined by the license.

This ensures the implementation of the IntellQ VIS versatile Architecture that provides a multi-user platform to support all „use-case“ operating conditions.

IntellQ VIS Server and Studio have Interfaces to databases, file systems and media sources which contains targets and media sets to analyse. Those are accessed, extracted and loaded to IntellQ DB via IntellQ pre-defined interfaces and extractors.

Interfaces to databases and file systems with FR targets:

- IntellQ VIS pre-defined extractor to all major databases (MySQL, MS SQL, Oracle, DB2, PostgreSQL...)
- IntellQ VIS MQ (Message Queuing)

Interfaces to strategic media systems, tactical devices and open source media content (Internet):

- Harmonized IntellQ VIS high performance interface (ONVIF technology platform for SOAP, RTP, Motion JPEG, MPEG-4, H.264, H.265 and other)
- IntellQ VIS wired/WiFi MQ (Message Queuing)
- IntellQ RPA – Robotic Process Automation with media crawling content capture

IntellQ WEB

NEW

IntellQ WEB runs on a browser (e.g. Google Chrome) and serves particular facial recognition requests. It facilitates and accelerates the deployment of the IntellQ facial recognition network and makes it easily and quickly accessible to all IntellQ users.

IntellQ PDF

NEW

Data exchange between national LEAs is very often done via PDF documents. IntellQ „push-button“ PDF module extracts images and accompanying text from PDF files and automatically enrolls recognized faces into the target IntellQ databases.

IntellQ OSINT

NEW

IntellQ OSINT module uses software robots to crawl and collect content from open sources on the Internet. IntellQ OSINT does Information retrieval, Information extraction, Trend analysis, Link analysis (SNA), Data visualization and Collaboration. While collecting content from the Internet IntellQ OSINT automatically does text indexing and Natural Language Processing and automatic enrolment of all detected and recognized faces into the target IntellQ databases.

Early Alerting

When IntellQ finds the targeted face in the monitored media set(s), an alarm is raised and the notification is sent to the IntellQ operator(s).

Early Alerting Subsystem operates in real-time via following services:

- e-mail messages
- SMS messages
- POP-UP screens

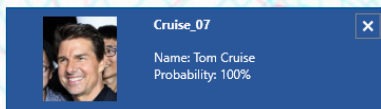


Figure 2: Built in notification (Alert)

Visual Analysis module

Visual Analysis module provides User ability to cross-check all data in Media Sets against Targets, Target sets and all Unknown faces.

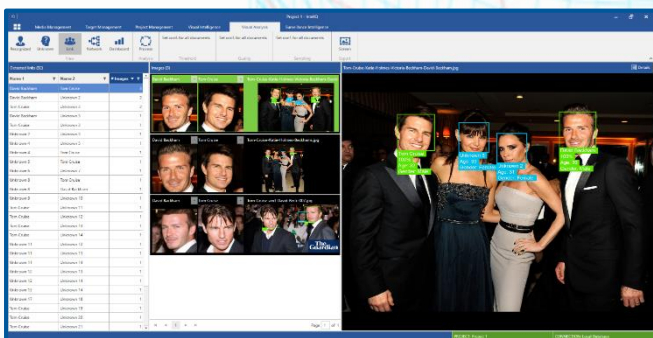


Figure 4: Visual Analysis module

- most commonly recognized faces & in which documents faces have been found
- most commonly unknown faces & in which documents this faces were found
- most commonly related faces & in which documents (Images / video records / streams) have been found associated (several people are together in several images or videos)
- Deep analysis functionality for an “undetected” face

Map View / GIS module

Map View Dashboard displays locations on the map for all faces (detected, recognized or associated), cameras (EXIF supported) or any other entities within IntellQ DB with GEO location.

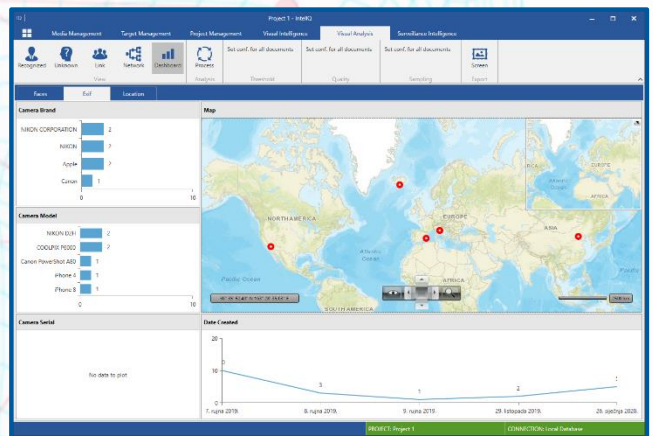


Figure 5: Map View / GIS module

The two main views are in the Map View focus:

- Point-view on the map
- Tracking the movement of the target(s) in time and space

Map View Dashboard is also enriched with:

- EXIF meta-data: Camera Brand, Camera Model, Camera Serial, Date of origin etc.
- Location: Name, Country, State, City, Address, Postal Code

Target Profiling

Creating a gallery of images (targets)

- Manual and automated data entry of all master data (Name, Surname, Additional Description, Age, Gender, Priority ...)
- Manual and automated data entry of all additional attributes collected during IntellQ VIS processing, such as data collected from open source: web portals, forums, social networks, etc. (e.g. nicknames, user accounts, target person movements (GEO points), time of occurrence, area of interest etc.)
- Priority represented with different colours
- Type: Black/White List, Employee, Management, VIP, Wanted, Missing, ...

Network Analysis / SNA Module

Network Analysis Dashboard visualizes complex social relations detected and defined by IntellQ VIS link analysis engine.

A Network Analysis tool will show connections between all detected faces out of processed "Media Set(s), regardless Recognized or Unknown.

By enriching recognized and/or Unknown faces with additional meta data the Network Analysis Dashboard will be capable to perform even deeper Data Mining Analysis via setting up different filters.

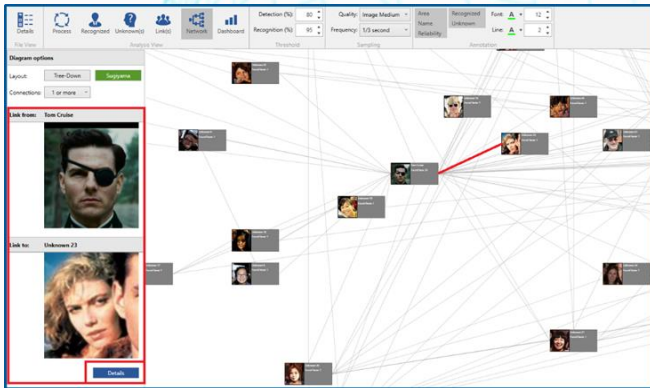


Figure 6: Network Analysis / SNA Module

IntellQ Mobile

IntellQ Mobile is an Android application for mobile phones and tablets working on Android Operating Systems.

IntellQ Mobile is served by IntellQ Server or IntellQ Studio instance.

Main IntellQ Mobile app functionalities are:

- Capturing photographs using mobile phone camera
- Capturing videos using mobile phone camera
- Sending captured photograph and video documents for processing to IntellQ Server or Studio
- Receiving information of processed photograph/video documents

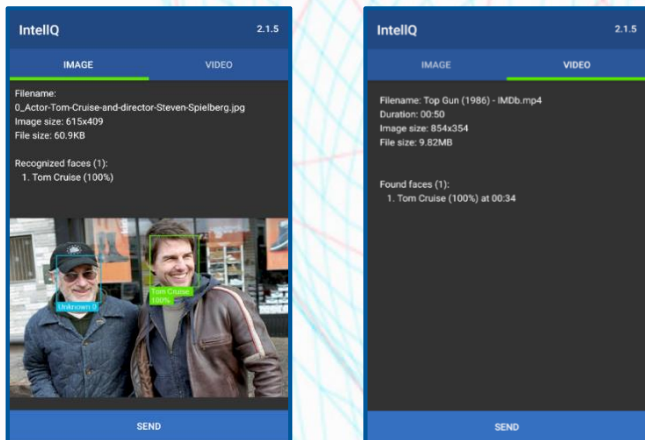


Figure 7: IntellQ Mobile Image and Video processing results

Project Management

- Case opening with unique ID and definition of the scope of the investigation
- Defining collections of multiple investigation materials such as image, video, IP stream, camera stream documents
- Describing investigation cases and storing a large number of materials (images, videos, IP streams, camera streams)
- Case monitoring, case supervision, case closure
- Secure export of collected investigation case materials for further processing by 3rd party tools

Project Collaboration

All Users within to the same Project may communicate to each other using internal "Project Activity" messaging service. System administrator may communicate to all users in the system.

User rights and user groups

User Groups define User's rights and roles in IntellQ VIS system. According to given rights and roles, User may access given IntellQ VIS projects, modules and tasks.

Minimum HW & SW requirements

IntellQ	Server	Client	WEB app	Studio
CPU	Intel Xeon 16 Cores	Intel Core i3	1.9 (GHz)	Intel i5 or i7
GPU	Graphics full HD	Graphics full HD	Graphics full HD	Graphics full HD
Display	15.6" LED Full HD	15.6" LED Full HD	22" LED Full HD	15.6" LED Full HD
RAM	32 GB	4 GB	2 GB	16 GB
HDD-SSD	2 TB	500 HDD	250 HDD	500 SSD
NIC	1GbE LAN	1GbE LAN	1GbE LAN	1GbE LAN
Wireless Network	n/a	n/a	n/a	Wi-Fi 5 (802.11ac)
Optical drive	DVD+/-RW unit	n/a	DVD+/-RW unit	DVD+/-RW unit
Power Supply	redundant	tailored	tailored	tailored
OS	MS Windows Server® 2012	Windows 10 Home 64	Web Browser (e.g. Google Chrome)	Windows 10 Pro 64

Mobile
NETWORK Technology: HSPA (3G) / LTE (4G)
DISPLAY Type: Capacitive touchscreen, 16M colors
Resolution 1440 x 2560 pixels, 16:9 ratio
CPU: Quad-core
MEMORY Internal: 32GB
MAIN CAMERA: Single 12 MP
Video 1080p@25fps
COMMS WLAN: Wi-Fi 802.11 a/b/g/n/ac, dual-band
GPS: A-GPS, GLONASS, BDS
USB: microUSB 2.0 for easy loading IntellQ VIS Mobile application

Table 1: IntellQ HW & SW requirements

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