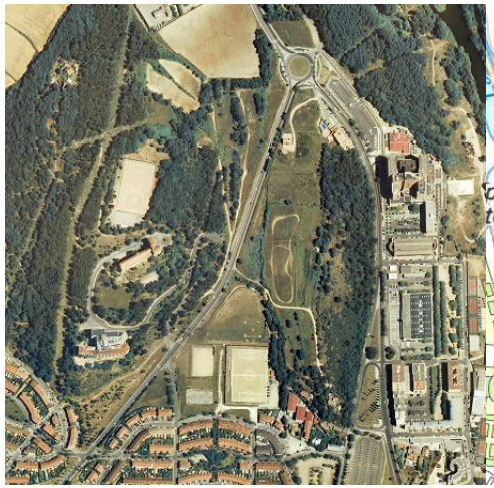

Cataloguing and visualizing aerial imagery at the Institut Cartogràfic de Catalunya

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ICC
Institut Cartogràfic de Catalunya

Generalitat de Catalunya

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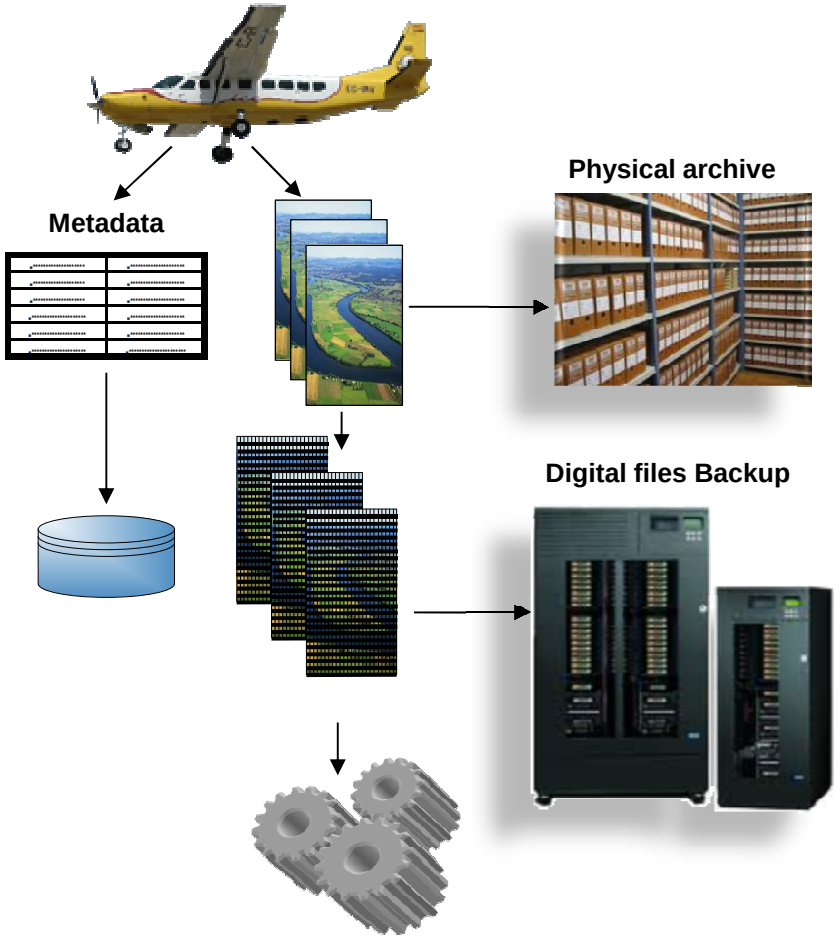
  - Cataloguing photogrammetric flights
  - Previous image catalogs and production integration
- Aerial imagery inventory
- New approach to image cataloguing and exploitation
  - Desktop exploitation

- Next steps & conclusions

Cataloging photogrammetric flights (I)



Analogical cameras

- Image negative was catalogued in a traditional way
- The metadata Data Base had information about the location of the physical file
- The images were scanned before going into production
- These images were stored on tapes for long term storage
- Little data processing was needed to meet the needs of the different production departments

Cataloging photogrammetric flights (II)

Digital cameras

- Image negative was no longer available
- New data was ready to go into production: no need to scan.
- The need of preprocessing data for different production departments was increased due to the different data structure of the DMC images
- The metadata Data Base had to be upgraded in order to store information on the digital location
- Catalogue was not “File Centered”

Previous image catalogs and production integration

- Metadata flight catalog
  - Auxiliary information on the flights surveys using analog cameras

    Code, Year, Flight Scale, Overlap, Author, Customer, Number of images, Camera, plane…
  - Information down to block/strip level (no image level)

	Vol	Subcc	Any d	Denominació	Escala del v	Emulsió	Recob	Reci	Autor	Destinatari	Data de	Nomb
−	10001	1	1963	Accessos a Barcelona	5000	B/N	60	0	CETFA	DGC		39

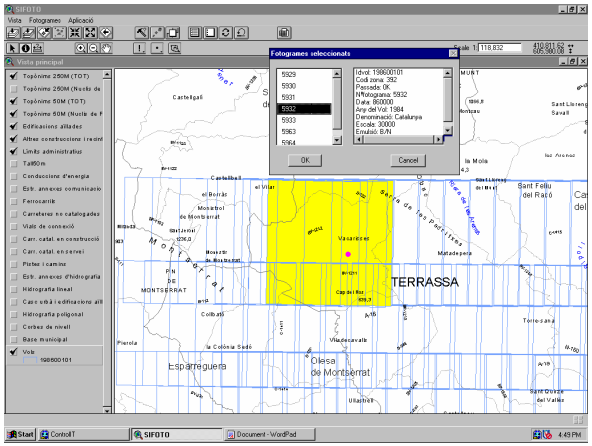
IdBloc	Bloc	Passada	Data de	Fotograr	Fotogram	Full del MTN	Fotograma inici	Fotograma final	Arxiu GPS	Rolle
67433		10	863	2331	2338	447				
67434		20	863	3178	3179	448				
67436		21	863	3201	3208	420				
67435		21	863	3201	3208	420				
67437		33	863	2962	2968	420				
67438		51	863	2850	2855	420				

+	10002	0	1963	Accessos a Barcelona C-246	12500	B/N	60	0	CETFA	DGC		42
+	10003	0	1965	Palma - Santa Ponça	5000	B/N	60	0	TFA	DGC		119
+	10004	0	1965	Sóller - Valldemosa	23000	B/N	60	30	TFA	DGC		33
+	10005	0	1965	Lleida - Tarragona - Barcelona (polígor	12000	B/N	60	30	CETFA	DGC		532
+	10006	0	1965	el Garraf	5000	B/N	60	0	CETFA	DGC		134
−	10007	0	1966	Llobregat - Besós	10000	B/N	60	30	CETFA	DGC		140

  - No information on flight surveys using digital cameras
  - No relation with the digital file

Previous image catalogs and production integration (II)

- Georeferenced image catalog
  - 70 % of the flight catalog
  - Information down to image level
  - Graphical exploitation of vector data for ArcView 3.0 and Avenue



  - No information on flight surveys using digital cameras
  - No relation with the digital file

Previous image catalogs and production integration (III)

- Scanned images stored on magnetic tapes
  - No quality control of image readability had been performed
  - Image files in non standardized formats

    Proprietary formats, different formats and compressions,…

- Catalog of scanned images
  - List of images per magnetic tape with auxiliary information on scanning data
  - No relation with the corresponding image of the flight surveys

Previous image catalogs and production integration (IV)

- Three different catalogs
- No direct correspondence with the different database registers
- No crossed verification
- No support for digital imagery
- No maintenance on the exploitation of the georeferenced metadata catalog
- No connection between data and metadata
- None of the catalogs were used for production purposes

Aerial image inventory

	# of photos	# of digital files
DIGITAL *2005-2011*	331.353	331.353
ANALOG *1942-2005*	385.504	135.099
	716.857	466.452

Aerial image inventory

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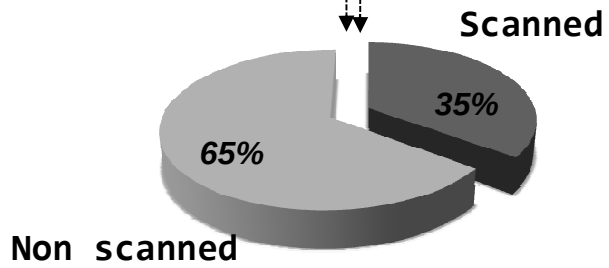

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Georeference	271.819	102.261
NO georeference	113.685	30.596
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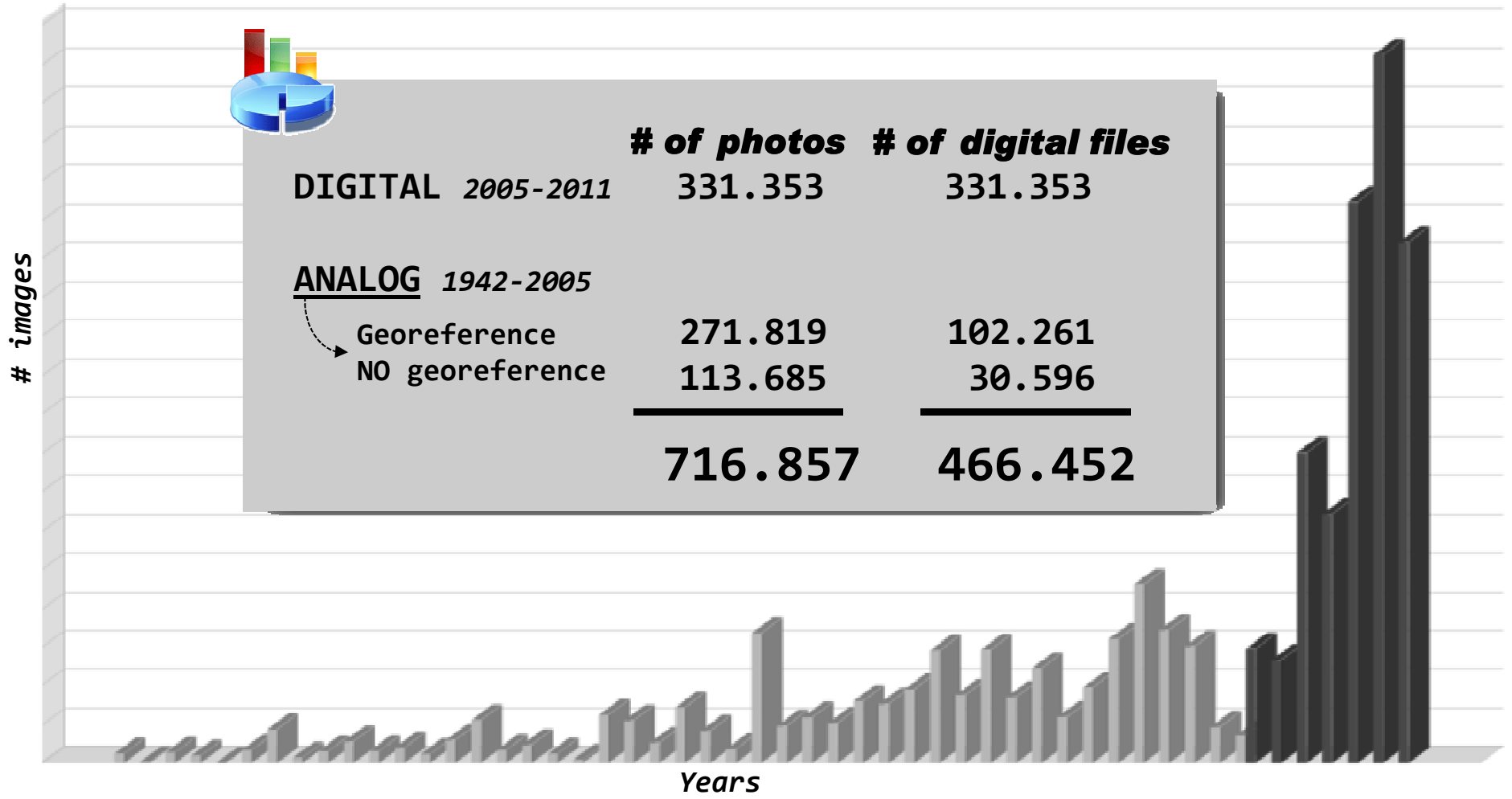
Aerial image inventory



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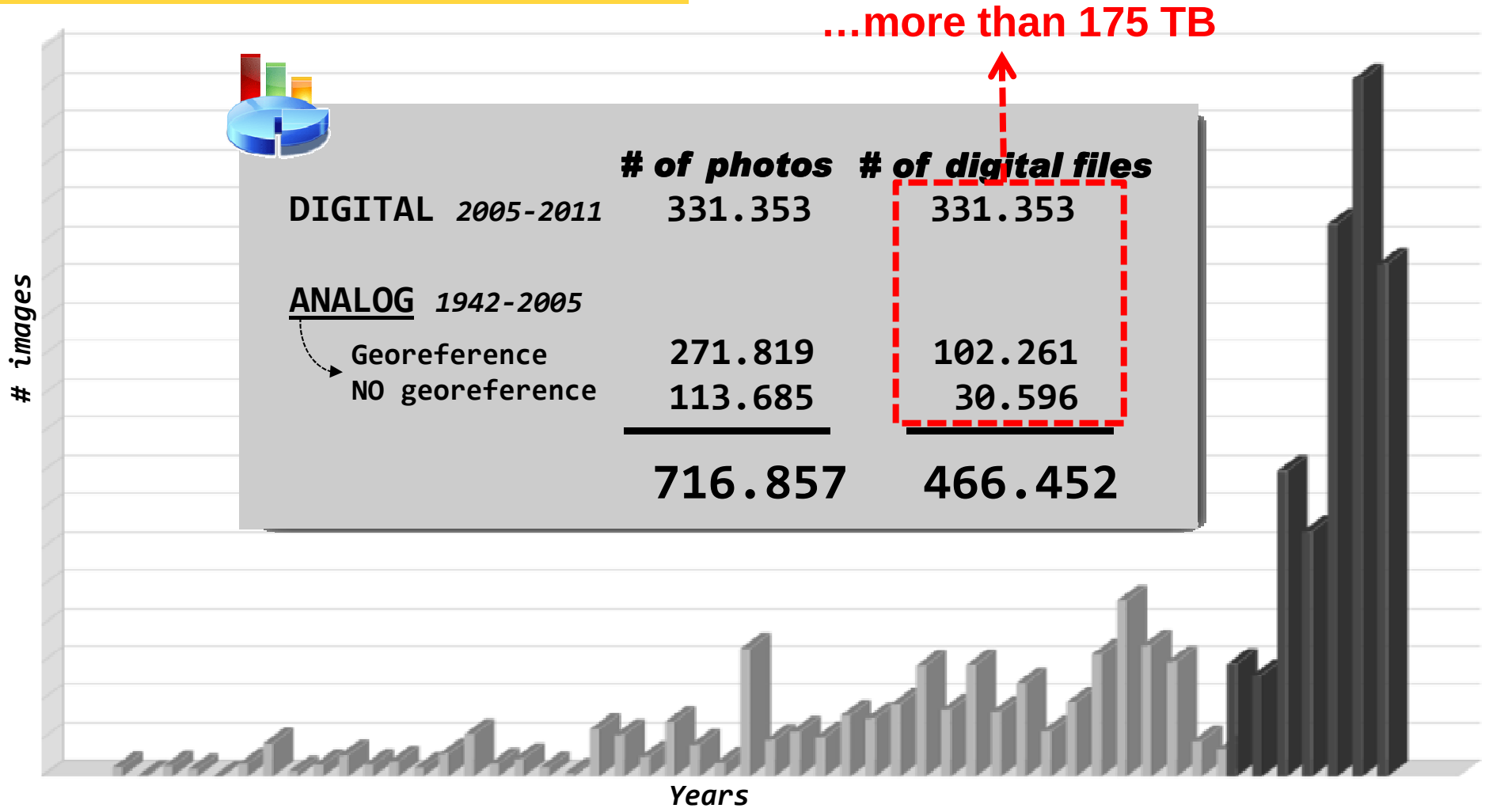
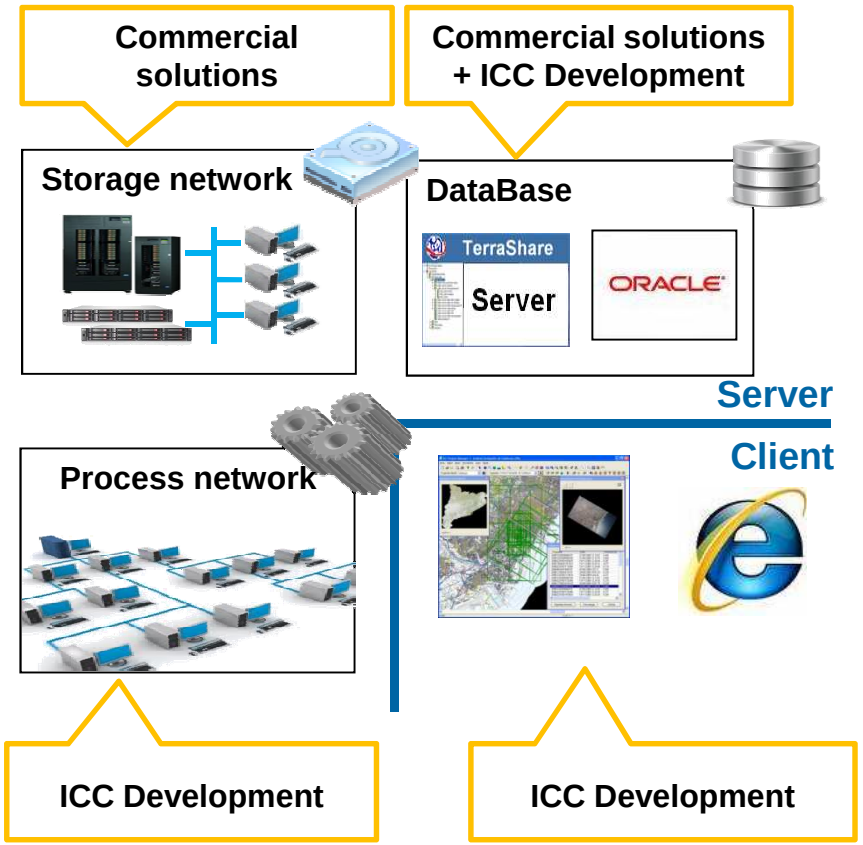
Aerial image inventory



New approach to image cataloguing and exploitation

- Image file level
  - Granting readability of all ICC images
  - TIFF format transformation (Tiled, JPEG Comp. QF 95, Overviews)
  - Image files managed by a Storage Management solution
- Catalog level
  - Single data & metadata catalog (Unique relation between image file and its corresponding metadata)
  - Information cross-checked and verified
- Exploitation level
  - Graphical and alphanumerical searches
  - Visualization of on-line low-res imagery for all digital and scanned imagery
  - Automating data retrieval processes
  - Integration with production processes for both cataloguing and exploitation

New approach to image cataloguing and exploitation (II)



Client-Server architecture

Single Metadata & Data catalog

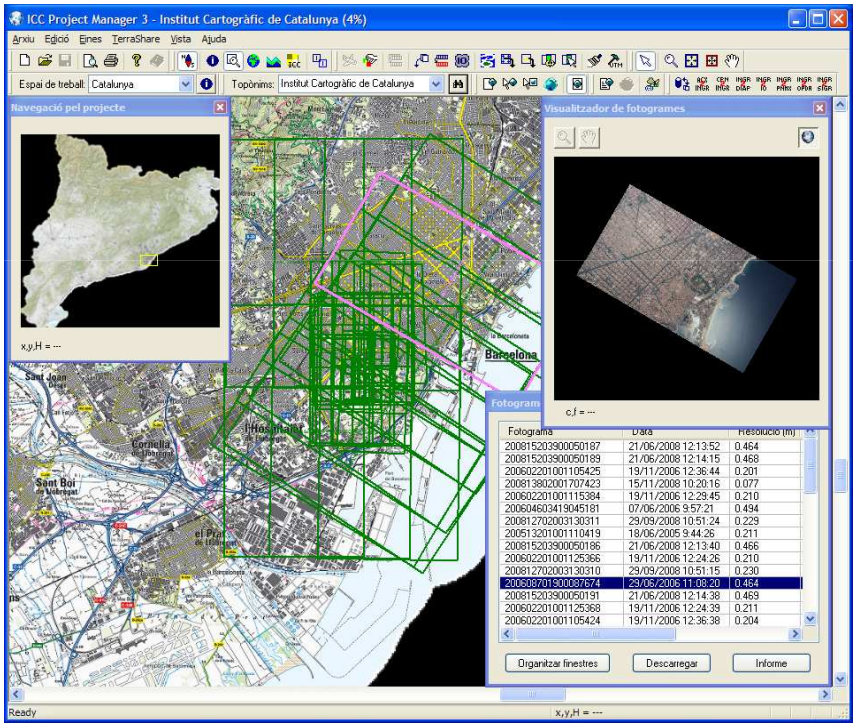
Two main storehouses in the server side

- *OnLine data storehouse: high speed disk*
- *Managed data: automatic data retrieval and data distribution on managed servers*

Direct connection to the processing network from the client without additional human intervention

ICC's applications is used in client side

Desktop exploitation



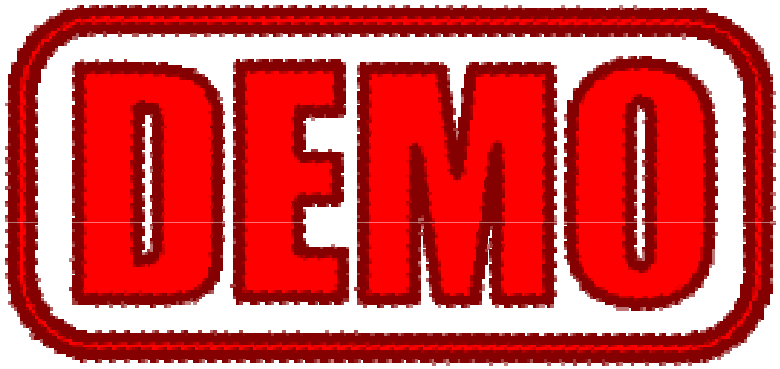
The application was initially created at ICC to manage photogrammetric flights

Integrates production tools with ICC Services:

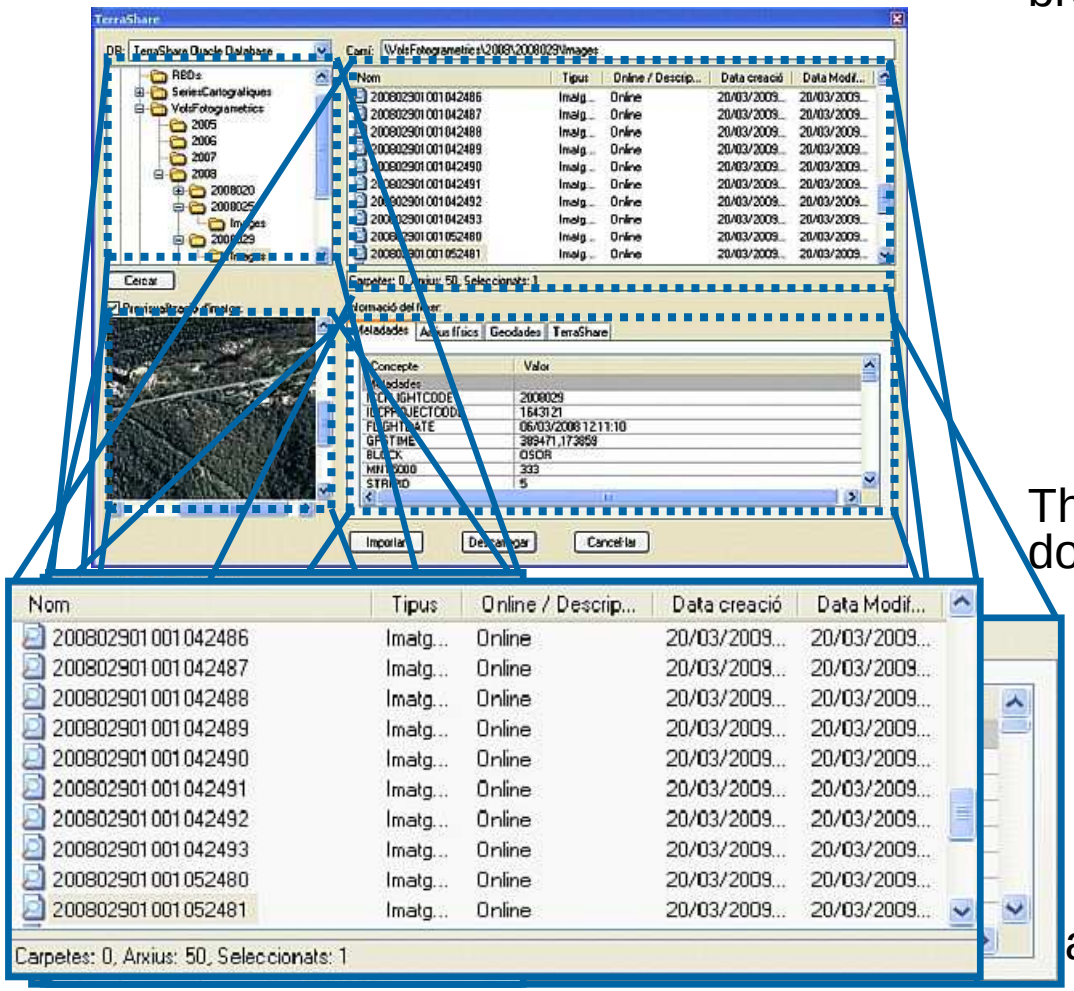
- *WMS visualization as background image*
- *Connection with terrain height data*
- *Internal geocoding tool*

Aerial imagery catalog integration

- *Data ingesting*
- *Data browsing and retrieval*
- *Graphical and alphanumerical searches*
- *Low-resolution image visualization*


DEMO

Desktop exploitation (II)



The application enables browsing throughout the logical structure as a file browser

- *Folder browsing*
- *Display folder contents*
- *Preview of the selected image*
- *Auxiliary information of the selected file:*
  - *User metadata*
  - *Auxiliary files*
  - *Georeference*

The application enables refined data downloading

- *Selection of the auxiliary files to download*
- *Connection to the processing network for image conversion*

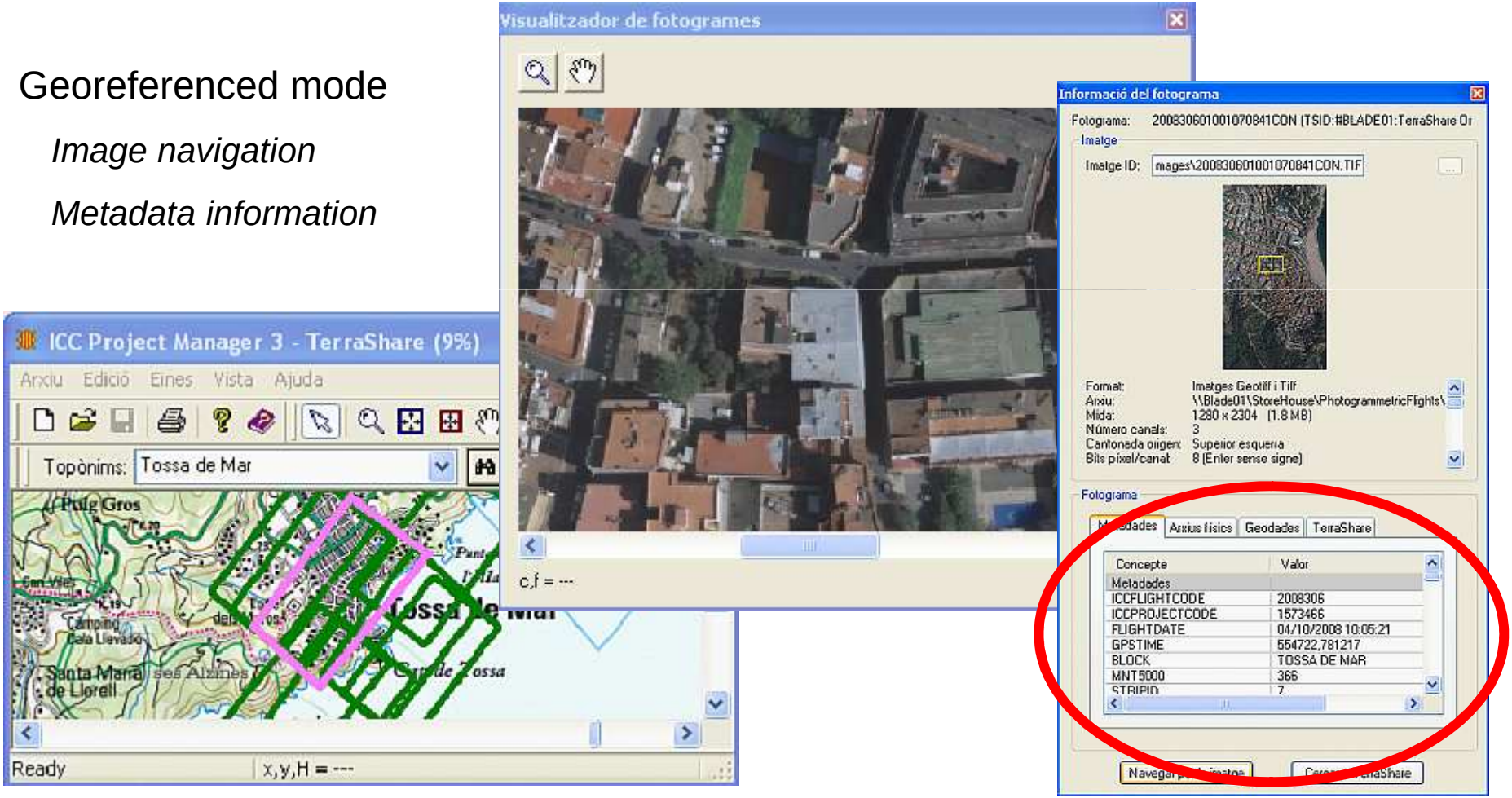
georeferenced view is available by ading the files in the main window

Desktop exploitation (III)

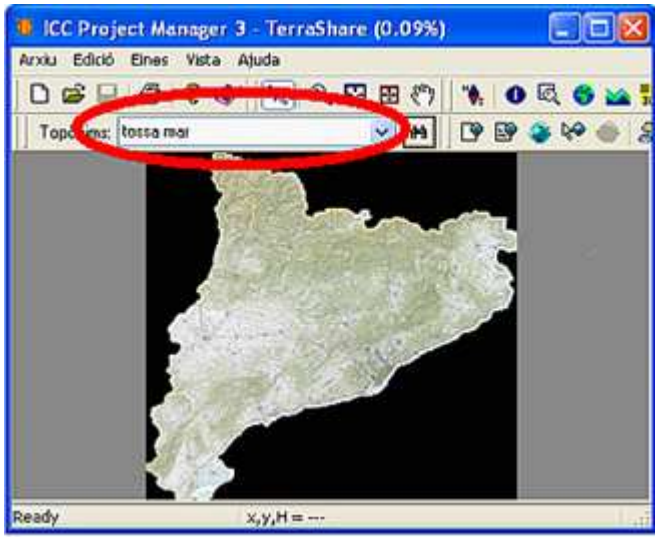
Georeferenced mode

Image navigation

Metadata information



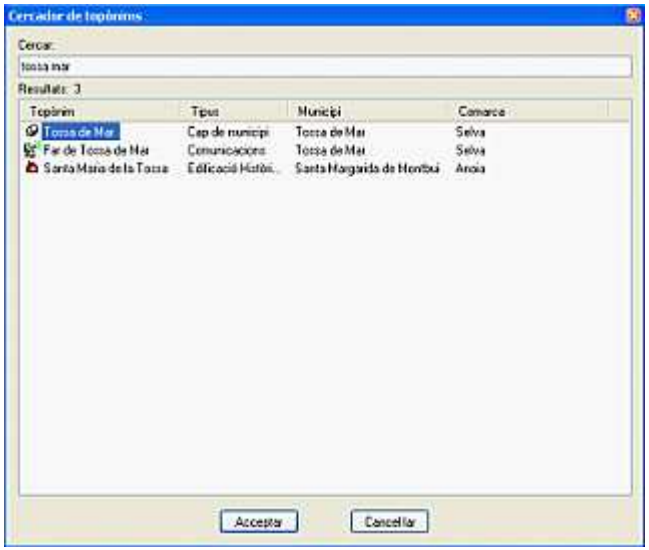
Desktop exploitation (IV)



Typing in a place name

background imagery using ICC WMS services

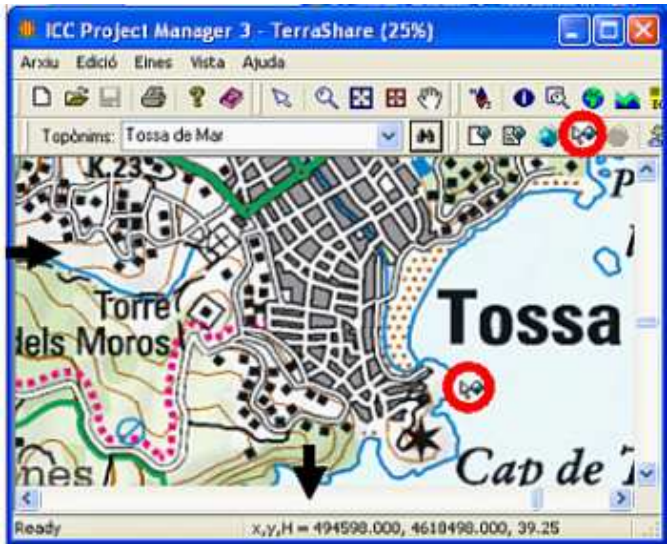
Desktop exploitation (IV)



Selecting one of the suggested place names

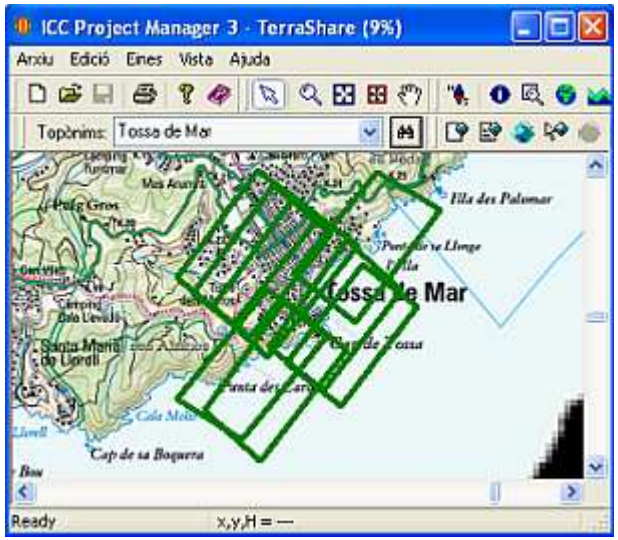
place names though ICC geocoding tool

Desktop exploitation (IV)



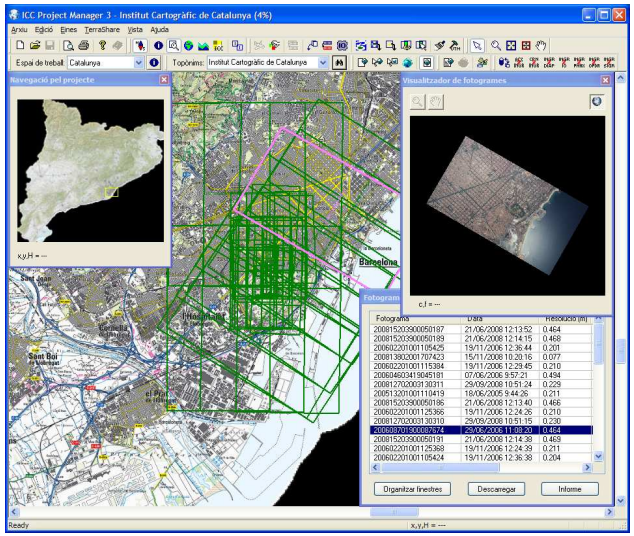
Selecting the exact desired location

Desktop exploitation (IV)



The results are shown over the map

Desktop exploitation (IV)



View low-res thumbnail & download the image

Automatic image request in background

Few minutes operation if not in cache

The user deals with logical location

Physical data handling is done by the system

Next Steps or…
still active problems

- Not all the image negatives have been scanned (***250.000 images***)
  - Scanning projects must be included in our roadmap
- Not all the images have a digital georeference (***113.000 images***)
  - Georeferencing projects depending on the existing data

    Digitizing flight plans

    Manual georeferencing of single images

    …
- Fully automation of data management
- Web access to ICC's aerial image catalog

Conclusions

- Image accessibility
  - Access to more than 600.000 image register and increasing
  - Automatic access to more than 433.000 image files and increasing
  - Automatic management of more than 175 TB and highly increasing
  - Granting system scalability
- Integration into production workflows: Cataloguing and Exploitation
- Cataloguing digital files for long-term preservation

Thanks for your attention

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