

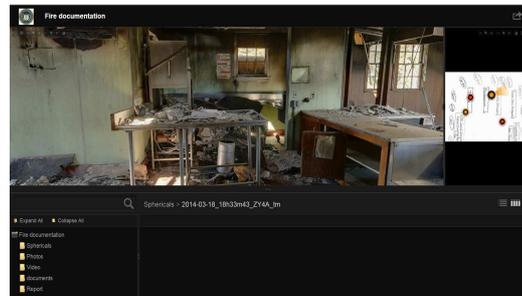
VAM

Visual Asset Management

to document, investigate, share and present massive digital data.



crime scene documentation



disaster and fire documentation



accident documentation



safety security training

from on site documentation all the way to court presentation

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1. Executive Summary

This document describes the **VAM Visual Asset Management Database** application.

Developed to provide tools and workflows to improve and simplify the management, sharing and exploration of huge multimedia data, enriched with metadata for fast cross-finding.

The basic idea behind VAM is to provide a platform that allows different experts to upload **all** digital assets to a database, classify and visually link them to provide a secure, powerful, fast and always up-to-date content-sharing application.



A tool optimizing collaborative analysis, investigation and presentation.

2. VAM design goals

Typical documentation projects like the documentation of a scene of crime, a fire, an accident or critical infrastructure typically involves many different assets in various formats.

The challenge when developing the VAM database application was to handle all digital assets in a straight forward way. Main assets are: maps, drawings and satellite images for overall orientation, still photos, full spherical images and videos for detailed visual representation, written documents in different formats (Excel, Word, PowerPoint, handwriting etc.), 3D models, record lists and important links to other software applications or e.g. a live stream from a web cam.

Other than known DAM (Digital asset management) systems the VAM extends the sorting criteria by visually linking the assets one to another hence referencing them to certain locations.

Based on the long experience of Weiss AG in the field of visual asset management, we were approached by the Shell Inc. Company to develop a database application to visually manage all their digital assets related to the documentation of gas and oil platforms. The success of Google services like Google Street-view, Google earth and Google documents show that visual linking of information is a very straight forward and user friendly method. The VAM extends these functionalities by combining them in one application without the need to host the data on Google servers, but on the users own server or even on stand-alone computers.

Besides other requirements the challenge was to develop a system that:

- Supports all digital data formats
- Stores the original unmodified data
- Allows fast data provision on low bandwidth networks
- Allows visual linking of all assets
- Contains a comprehensive user rights management with action logger
- Adds security to digital data with full audit control facilities
- Allows database access without installing additional software on the user PC
- Supports unlimited file- or project size
- Allows the publishing of projects for online and offline viewing
- Allows automated report generation for print
- Can be interfaced with 3rd party software
- Can be operated on local machines or on a client server setup

The above requirements were addressed in our design as described in the following pages.

3. VAM overall architecture

The **VAM Visual Asset Management** database application allows visual managing, exploring and deploying of all digital data and file formats.

The chosen path was to use an internet browser as client, assuming that every computer has at least one internet browser (Internet Explorer, Firefox, Chrome or Opera) installed.



Accessing the application via network (internet, intranet, mobile or satellite) connections or working with a published project only requires a Computer with an up to date Internet browser (Chrome, IE, Firefox, Opera) installed with flash enabled.

When working in the stand-alone mode (on one single PC) only the VAM application needs installing and is operated via an Internet browser.

4. Overall strategy for data provision in VAM

The database is designed to support all digital files. So there are no limitations. All digital files can be uploaded and stored as unmodified original files.

Original files can be displayed in the chosen internet browser (Firefox, IE, Google Chrome and Opera with flash enabled are currently supported) without the need to download additional plug-ins or software. We developed different viewer technologies and corresponding file converters to achieve this goal.

It is not yet possible to support all existing file formats to be displayed directly in the browser. This will soon follow therefore some special (proprietary) file formats have to be downloaded to be viewed locally in the corresponding software.

Supported file types for display in the browser

Right now supported file types for direct and fast online viewing in the browser are:

Image formats:

- Full spherical images with measurement pairs for taking online measurements.
- Full spherical single images. (No proprietary file format)
- Flat images. About 40 different image formats are supported

Video and audio formats:

- Several hundred different video file formats and codecs are supported. The different video formats are converted during upload in different resolutions allowing the observer to choose a lower resolution when only a low bandwidth is available. In this way video captures can be quickly shared while the original footage is preserved at maximum resolution.

Document formats:

- About 60 different document formats including PDF, Word, Excel, PowerPoint, Rich text format, XML, HTML to name the most commonly used document formats are supported. During the import process the original document is stored unmodified for later download. Also on the fly they are converted to a file format that can be viewed in a fast and convenient way. This has two major advantages. First the users no longer have to take care that other users have the right software installed on their machine e.g. Normally when sending an excel sheet the receiver has to have the same excel version installed on his machine to open it. This is now no longer necessary. Secondly hotspots and links can be put everywhere inside the documents linking to all other assets or to make provision to place external links like CCTV, websites or 3rd party programs like Walkinside, CAD applications, CRM and ERP database applications.

3D file formats:

- The 3D model viewer supports color textured meshed models and point clouds in popular formats as .ply .las .obj .klm and many more. It can even handle 3D CAD data. Again without the need to have more than an internet browser installed.

Html links and interfaces to 3rd party software:

- Html links to other websites, life sensors or webcams can be referenced and opened from within VAM.
- Duplex communication to 3rd party software has been established successfully for different applications.

In summary the most commonly used file formats can directly be displayed in the browser without installing extra software.

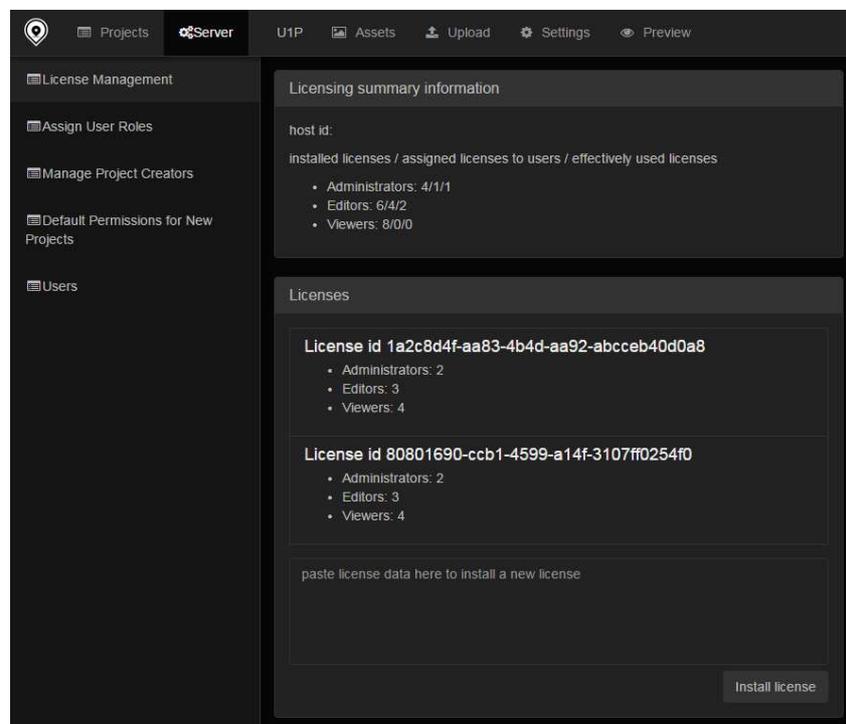
Access to content

VAM offers 4 different ways to access the content:

- login to the database for stand-alone or network usage
- publish an interactive project to a ftp- or web-server
- export an interactive project for stand-alone operation
- export a printable report as pdf or word document file

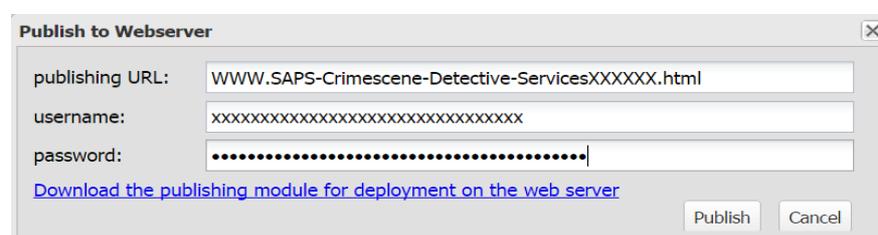
A: Access to database via secure user rights login

This option is used to create, manage, edit and share the database content in a database application. It can be run stand-alone (on one PC) or in a client server setup.



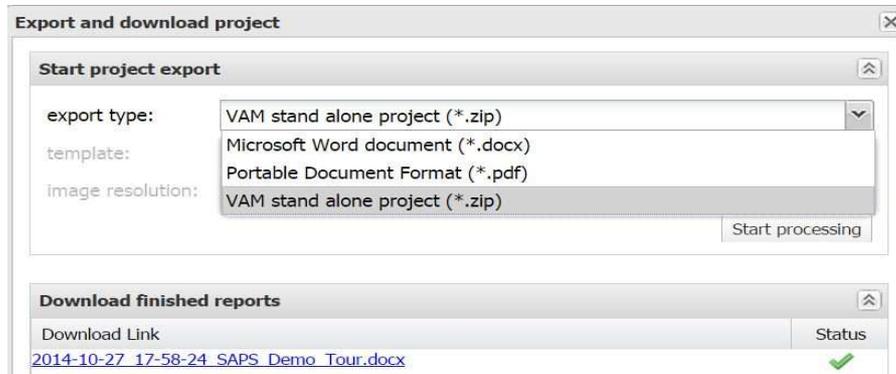
B: Publish to ftp or webservice

This option allows users to access the published project without a user license. The result is an interactive website that can be addressed via URL with or without login and also supports the publishing of different versions for different end user groups.



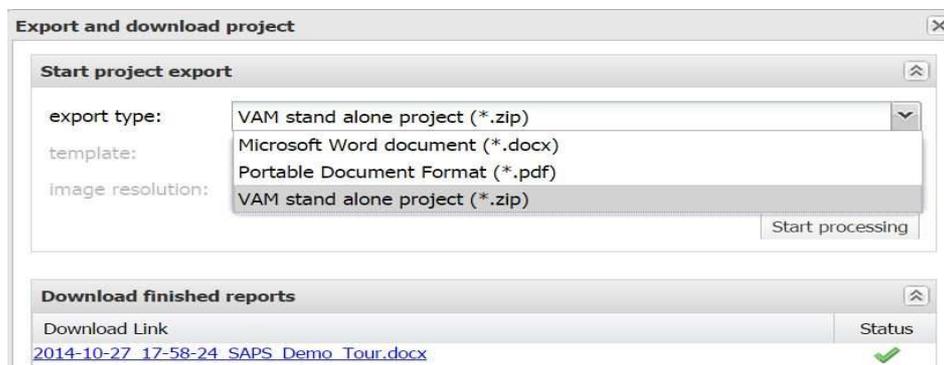
C: Publish as stand-alone project for offline viewing

This option is best when the whole interactive project is viewable off-line for example in court presentations or to hand over the project to others. Access can be password protected and the layout can be customized via template to match your corporate identity.



D: Publish as printable PDF or docX document file

This option is best utilized if a whole report is created as a printable document or as a special report in standard document format. Access can be password protected and the layout can be customized via template to match your corporate identity.



Direct link button

If a user wants to share a specific view in the database, for example to pinpoint a weapon, he can click on the direct link button. This creates a link that can be sent to someone else. When clicking on this link the project opens in exactly the same view and therefore is not only a screen shot but opens the full interactivity of the project behind it.



5. VAM user access right management

VAM has a powerful user right management integrated system allowing it to define

- which person
- is allowed to do what
- on which project and
- on which specific assets

There are 3 different fundamental roles inside VAM.

Administrator user:

The administrator can assign new users with specific user roles, but normally would not have access to the individual projects.

Editor user:

The Editor user can create, view, edit, publish and export projects. Additionally it can define which user is allowed to do what specifically.

View only user:

The view only user can access the projects to view specific (predefined by the editor) content but has no editing rights.

As the view displayed for the view only user is created on the fly by the database it is ensured that the view only user always has a real-time view of the actual status of the project.

Access policy

The standard access policy is based on a personal login with user-name and password.

All major actions performed on the database are stored in a log-file defining

- who
- did what
- at which time and date
- from which IP address

In combination with the user right management and database log-files, the username and password login procedure is very powerful, to keep track of and protect sensitive content, and provides a complete audit trail.

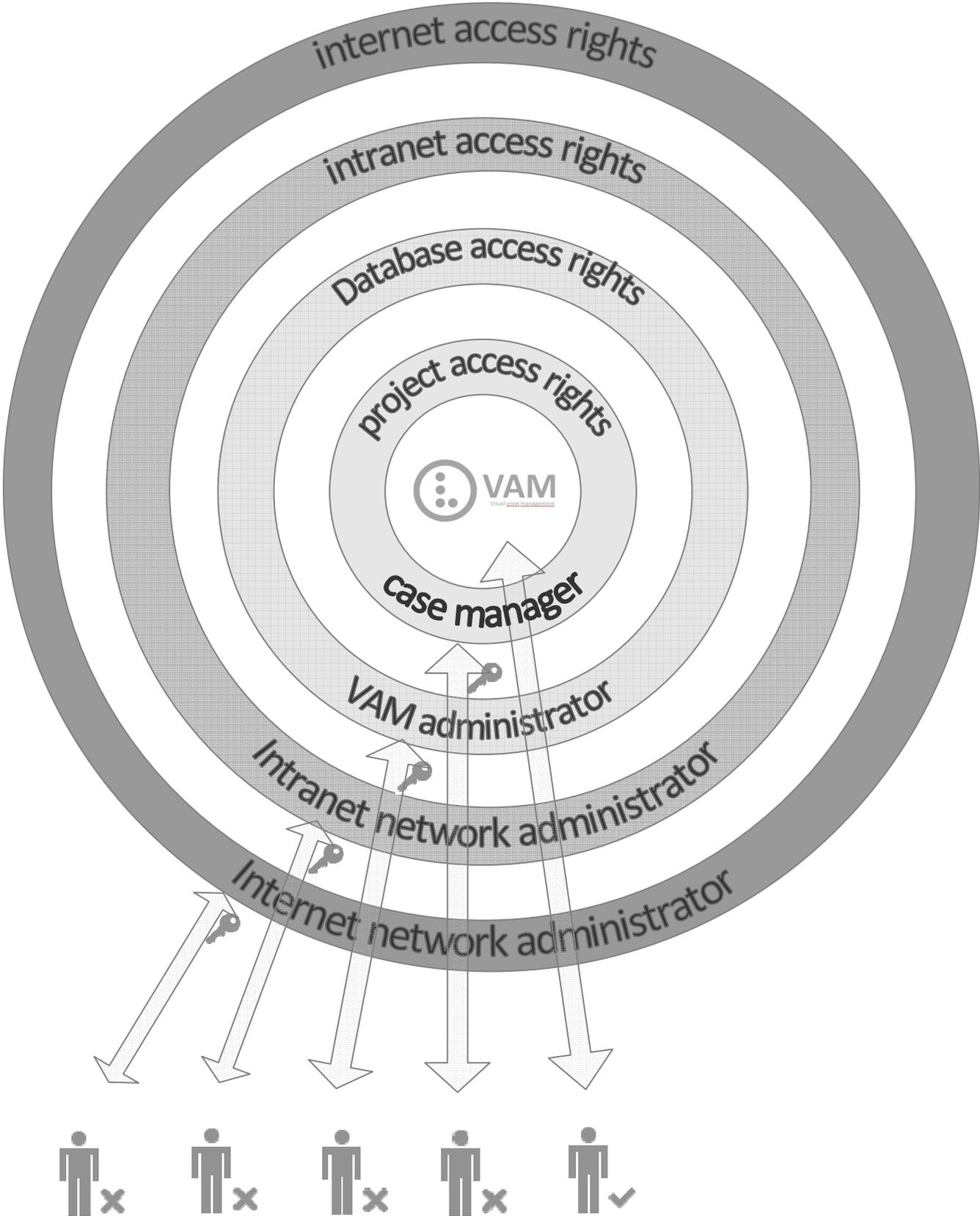
Integration with existing authentication systems

VAM can be integrated with existing authentication systems, enabling the members to use one password for all the software applications they use.

An interface to Microsoft Active Directory authentication system is provided. Other interfaces can be developed by Weiss AG on request.

6. Network security structure

Accessing VAM can be performed from outside via internet, mobile or satellite, or from inside an intranet or local machine, hence access rights are available. The following diagram illustrates the different security layers.



7.Licensing model

As the VAM application is developed and maintained completely in-house, different or modified licensing models can be implemented upon request. In the following the standard licensing model is described.

When developing the licensing program it was policy of Weiss AG to offer a secure and user friendly system. Therefore the following issues were mandatory:

No hardware-dongles:

The use of hardware dongles is not needed as they are too fragile and can easily be lost. As physical objects, they are difficult to replace and time consuming to provide.

No database access by Weiss AG:

One of the policies is that Weiss AG never wants or needs access to the database or a connected computer via network.

Fast and easy licensing:

Customers in different time-zones need to be able to add in more users directly without requesting additional licenses via mail or phone, as this creates delays and requires a response.

Temporary access license:

It should be possible to provide temporary access to people who don't actually use the database without having to purchase a license.

Simple and transparent licensing model:

Costs and work involved should be very clear and straightforward.

Licensing options

VAM can be provided as stand-alone or client-server installation.

Stand-Alone installation

This setup is utilized when VAM is operated on a single PC without the need to be connected to a network.

The user logs in to the VAM computer with username and password. This user has full admin, editor and view rights. Only one operator can work at a time. In the case where more than one person uses the computer he has to use the same user login. However the operator can grant "view only" access to others connected to the PC via network access. This might be a land-line, mobile or satellite connection.

Client-server setup

In the client server setup the VAM installation runs on one (or several) physical machine(s) and the user connects to the server with their PC, Notebook, or tablet via the network. The client uses the chosen internet browser and all operations are performed on the server(s).

In this setup the 3 different license types, administrator license, editor license and view only license are utilized.

The server installation always includes one administrator license. Editor and view only licenses can be provided by the administrator/s from within the VAM administration tool.

The server installation always includes one administrator license. Additional licenses must be purchased either with the VAM software or at a later time. To avoid having to wait for licenses a VAM administrator can generate temporary licenses online that are usable immediately. After paying the license fees the temporary license is made permanent.

User licenses are transferable, so if a user leaves the organization his or her license can be transferred to another user.

Remark: To not over extend available budgets, it is recommended to book a block of licenses in advance. When providing a new license the administrator gets feedback on the number of licenses already used and additional licenses available within the budget.

Combination of stand-alone and client-server license

In case both stand-alone setup and a client-server setup are used in the same organisation, the stand-alone licenses are also valid for working in the client-server setup.

Service and support contract

The VAM software development team continuously extends the functionalities and keeps the system up to date to keep track with changes in operation systems, browsers and new/modified file formats. The service and support contract covers service and support work and includes providing updates. When new functionalities are available they might be included in the software updates, but might also be regarded as new modules.

New modules

When new modules are available and not covered in the standard VAM installation nor covered in the service and support contract, Weiss AG will inform the client. He can then decide if he wishes to upgrade.

8. Highlights

Unlimited:

- Unlimited in the sense of data storage. The database can handle an unlimited number of assets. No limitation in file size.
- Unlimited in the sense of number of simultaneous users. The technology can handle thousands of simultaneous users and data requests.

Efficient:

- Efficient in the sense of performance, results and cost.
- Our users report significant savings in time and money with increased performance when operating their projects.

Fast:

- Fast in the sense of data access. Our asset streaming system allows access to data in a load on-demand technology. Only the data is needed to be displayed is streamed. This enables fast viewing on low bandwidth.
- Fast in the sense of operation. Creating projects via drag and drop is extremely fast, so is the time between uploading data and sharing with others.
- Fast in the sense of providing access via direct license creation without waiting for responses from Weiss AG.

Multilingual:

- Multilingual in the sense of entering data and User Interface. We can support all UTF8 characters and also right to left writing.

Global:

- Global in the sense of data access. It's possible to get access at every location around the world when you open the connection to internet or intranet. The application also works on mobile lines or satellite connection.

Individual:

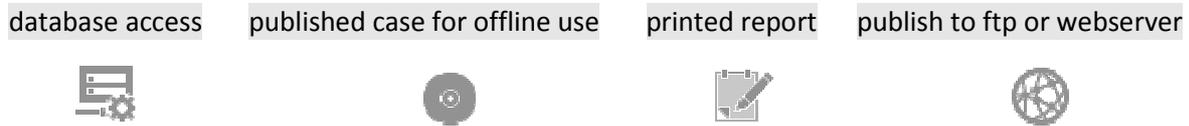
- Individual in the sense of interface layout and individual view. The user interface logos and hotspot icons can be defined to match your corporate identity.
- Individual in the sense of individual user's view. Different views for people with different viewing rights are created on the fly. For example, users with medical safety viewing rights don't have access to technical data, etc. The case manager can define which content people from different user groups shall see/get access to.

Secure:

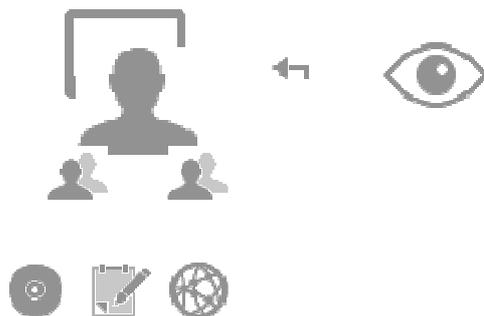
- Secure in the sense of protecting your content. Deleting data by an editor means that the data is made invisible but is not deleted from the database itself and can therefore be recovered if needed.
- Secure in the sense of preventing asset manipulation. An image verification system is integrated for the Civetta 360° capturing system and can be implemented for other hardware. As all actions of users are logged in the database, any manipulations can easily be found by cross-searching.
- Secure in the sense of keeping your original data. The database always stores the uploaded assets as original and can be downloaded as the original data as well.
- Secure in the sense of archiving your data. VAM offers to produce a complete database extract as a backup for archiving or for re-importing on a different physical machine, in case you want to move your data to a new physical machine in a different location.

Collaborative working scenarios

A variety of collaborative working and information sharing scenarios can be established as VAM offers 4 different ways of data provision:

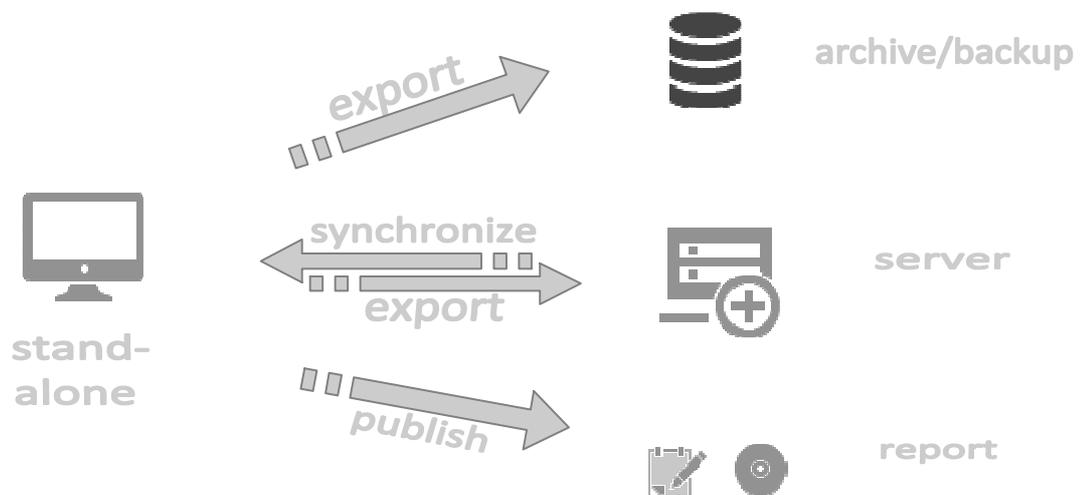


Standalone-setup



This setup allows the creation of projects/cases on location with or without network access. Colleagues at the same location can directly see and investigate the project together with the operator. Hence network via landline or mobile access is available, a view only access can be provided to others not present, e.g. to get a 3rd opinion.

The VAM database content can be exported from the stand-alone machine to a VAM server. Pre-defined user rights and possible updates are synchronised. Archiving and backup of individual projects, or the complete database, can be exported as well.

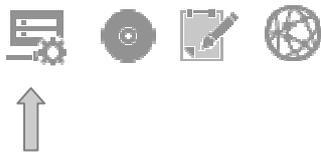


Client-server setup

This setup allows the creation of projects/cases in an outside location when a network is available. Colleagues with access rights can get real-time access to the project/case and can simultaneously work together, providing a finalised published case for storage or as a printed report, as well as publishing to ftp or a webserver.

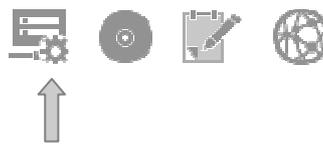
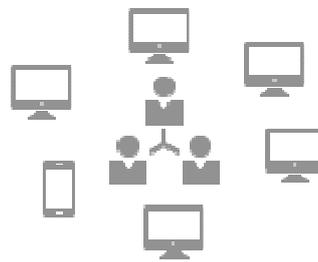
Standalone or client-server setup

team discussion and briefing



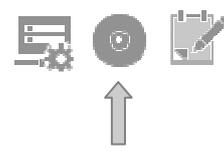
recommended

collaborative work/sharing



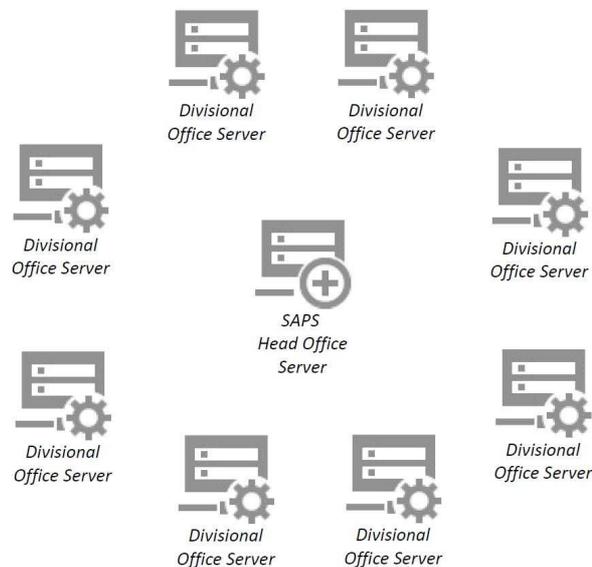
recommended

court presentation



recommended

In some cases it might be suitable to connect to and synchronize several office servers with a central server, what can also be realized with VAM.



9. Software and hardware requirements

VAM is designed for use on Computers with Windows or Linux operating systems. This can be Desktop, Laptop or Tablet devices. The graphic user interface has full touchscreen and smart board support. Screen resolution is automatically adopted and supports high resolution screens with 4K or more as well as split screen and multi screen set-ups.

Minimum and recommended specifications for different setup scenarios.

Client-User:

Defined as a user working on the projects/cases without having the database installed on his machine.

For applications operating on low-spec machines where the minimum requirements are:

CPU: 1,5 GHz, hardware accelerated graphics (CPU integrated or external) Vista, 7, 8 (32 or 64 bit) with a recent internet browser with Adobe Flash Player 11.4+ enabled. (Will work with limitations on IE7, 8 and 9 and Windows XP)

Stand-alone VAM user:

Designed to operate on low spec machines where the minimum requirements are:

CPU: 1,5 GHz, hardware accelerated graphics (CPU integrated or external) 64 bit Windows Vista, 7, 8 64 bit with IE10+, Firefox 17+ or Google Chrome with Adobe Flash Player 11.4+ (Will work with limitations on IE7, 8 and 9 and Windows XP)

For fast image processing 16 GB RAM and fast HDD or SSD storage is recommended.

Client-Server setup:

Designed to operate on a central server with many users accessing the server and working simultaneously on the same or different projects/cases.

Standard operation system for the Server is Windows 64 bit. Linux can be provided upon request as installer or pre-installed.

Remark: Due to Windows policy for more than 20 users wanting to work simultaneously, Windows © Server is required. As the application is running as a webserver, Windows © Server requires only one client license. Extra 3rd party costs are therefore marginal.

Server: Example configuration for 5 editors, 100 viewers

64 bit Quad-Core CPU, 2 GHz, 16 GB RAM, enough disk space to hold all data (recommended: 2 TB or more) RAID System to prevent loss of data in case of HDD failure is recommended.

64 bit Windows Vista, 7 or 8 or higher, windows server 2008 R2 or higher.

Java runtime environment 7 or higher (no cost)

Adobe flash player 11.4 or higher (no cost)

The application can also be installed on virtual machines.

Server: Example configuration for 50 editor user and 200 view-only user

64 bit dual quad core XEON CPU, 3 GHz, 128 GB RAM, enough disk space to hold all data (recommended: 8 TB or more).

64 bit windows server 2008 R2 or higher.

Java runtime environment 7 or higher (no cost)

Server: Example configuration for thousands of editor user and view-only user

This setup can be realized with VAM, there is no database limitation. A suitable setup requires distribution upon several physical machines with suitable bandwidth and can be designed upon request.

10. Customers worldwide

Well known authorities and companies world-wide utilize our products for different purposes to improve quality, speed and efficiency.



Governmental crime-scene, accident, fire and safety applications:

USA - FBI
Columbia - Fiscalia

USA – ATF
UK-Police

China - Guangzhou fire department
Qatar - MOI Qatar

Offshore gas and oil platform documentation and safety security planning:

USA-Shell
France-Gas de France

Brazil-Petrobras
UK -BP

Saudi Arabia-Saudi Aramco
Enbridge

Documentation and computer graphics:

USA Creative cartel
USA-Columbia pictures

Germany-BMW
China-Beijing capital museum

China-Forbidden city museum
Germany-TÜV Rheinland

11. Summary

The VAM database application is a very powerful and efficient tool to manage massive multimedia data. Using an internet browser to connect, interact and display your projects and cases opens a wide variety of applications.

To summarize some features of the VAM database application:

- Intuitive operation in a slim graphic user interface
- Easy drag and drop operation - what you get is what you see
- Support for all digital formats
- Visual asset management by linking and referencing from **all** digital data to maps, full spherical, flat images, documents and many more
- Real-time access to data without long waiting times even on low bandwidth
- Only internet browser and flash required to operate
- 4 flexible ways to access the data
- High security level for data and user management
- Easy ftp upload
- No database size limitation. The only limiting factor is the available storage capacity
- Modular in the sense of modular system architecture allowing adding in of new components and functionalities on demand.

Giving individuals a real-time view and enabling collaborative work has never been easier.

The whole work flow from data collection and managing, collaborative working and investigating in teams of experts up to team briefing and court presentation has never been faster and more efficient.

12. Contact

For further information please contact your local dealer or contact Weiss AG at:

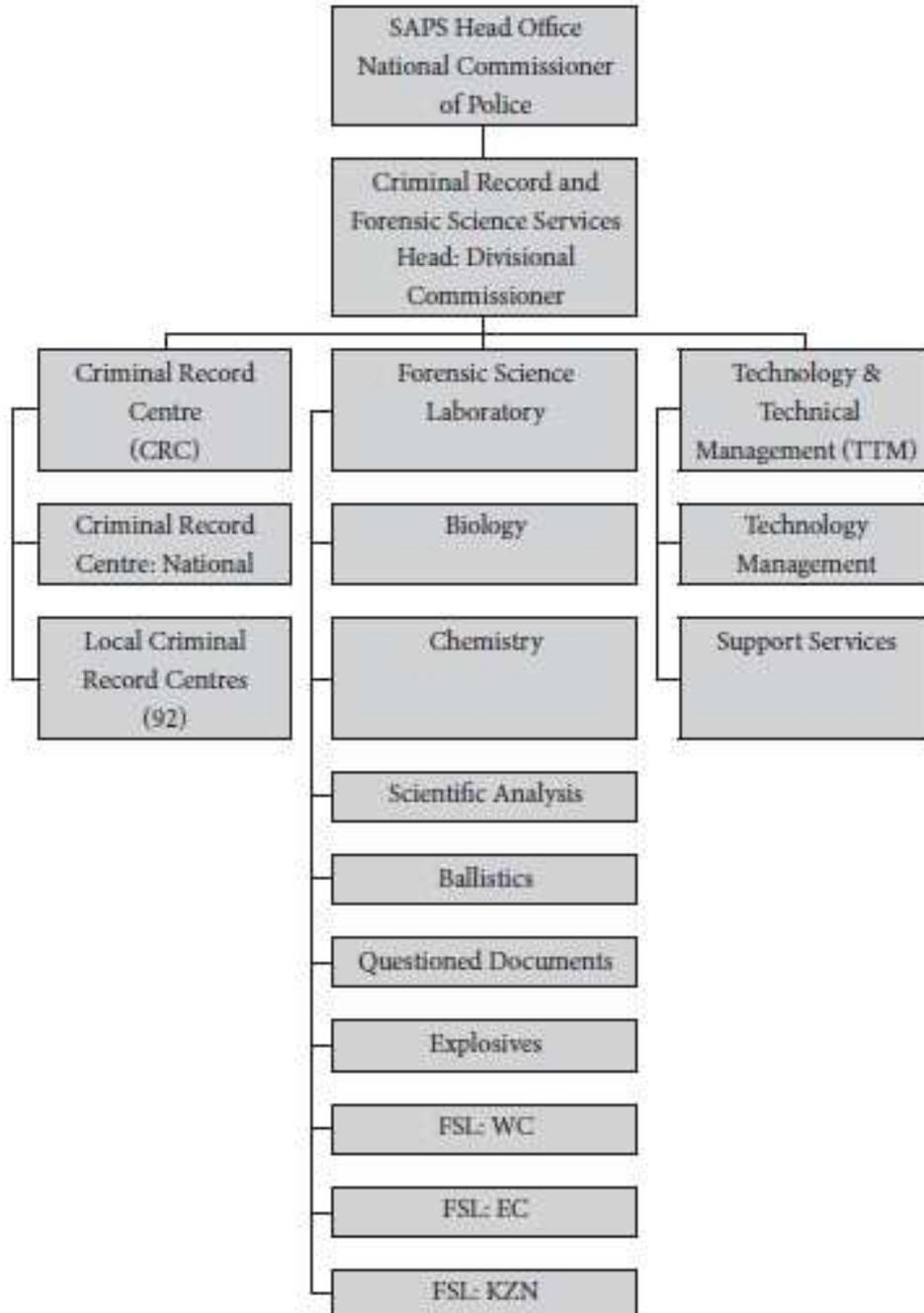
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Document created by Dr. Marcus Weiss

13. Appendix 1:

Copy from: http://www.issafrica.org/crimehub/uploads/CICH_3.pdf

Figure 2: Command and control structure of the SAPS Criminal Record and Forensic Science Service



Source: Omar in *SA Crime Quarterly* no 23, 2008

This structure can easily be implemented in the VAM application, enabling the different forces to work together on one platform, increasing speed and productivity.