Effective Container Inspection at BORDer Control Points

C-BORD Final Public Workshop

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INTEGRATION USER INTERFACE, DATA FUSION & DECISION MAKING

WP 7

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THE CHALLENGE

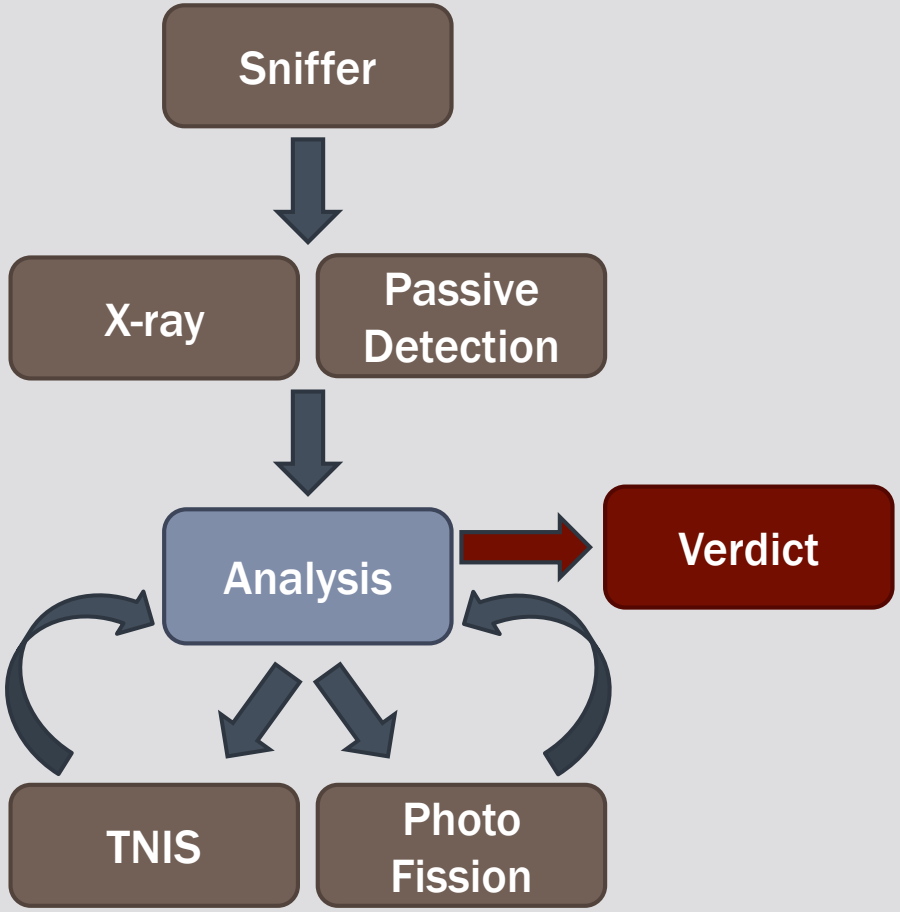
- C-BORD integrates various technologies allowing to detect different kind of threat
- Inspections take place at different time of the overall inspection process (depending of site configuration, first line or second line inspection)
- All these technologies provides data that need to be presented to an operator who must decide if the cargo is suspect or not
- Some of the data produced by the 5 technologies involved can be correlated so that it is more efficient to display them together

➢ The main purposes of WP7 are:

  - Defining a **process of inspection** integrating all the technologies
  - Defining a **data format** allowing to gather and store all the data
  - **Displaying all the results** in a way that's make the operator decision
    - Faster
    - More efficient ➔ less false negative and false positive

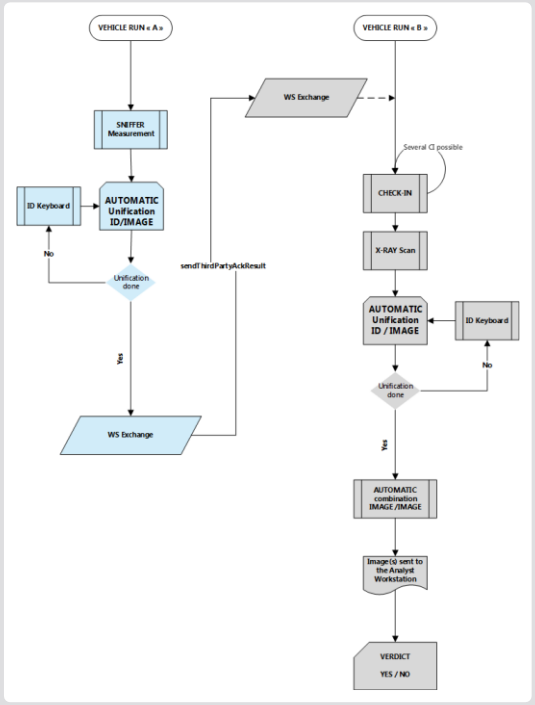
INSPECTION PROCESS

- Constraints:
  - Sniffer is the first inspection to take place
  - Passive detection portals are used before the x-ray scan
  - Embedded passive detection and x-ray are performed at the same time
  - It must be possible for an operator (using all the information already gathered) to define on the x-ray image where second line inspections (Photofission and TNIS) will take place
  - Once the second line inspection result is know, it must be displayed to an operator (together with the information already got)
  - Any technology can request some information from the server to improve its result before sharing it
  - Must be compliant with Smiths Detection systems

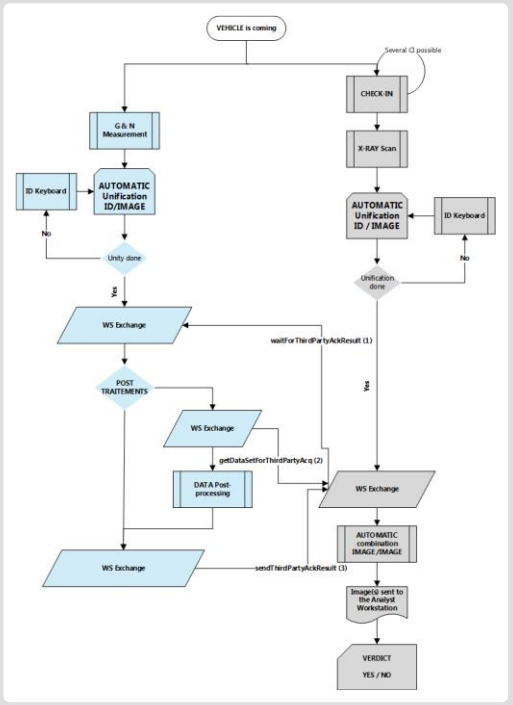


INSPECTION PROCESS

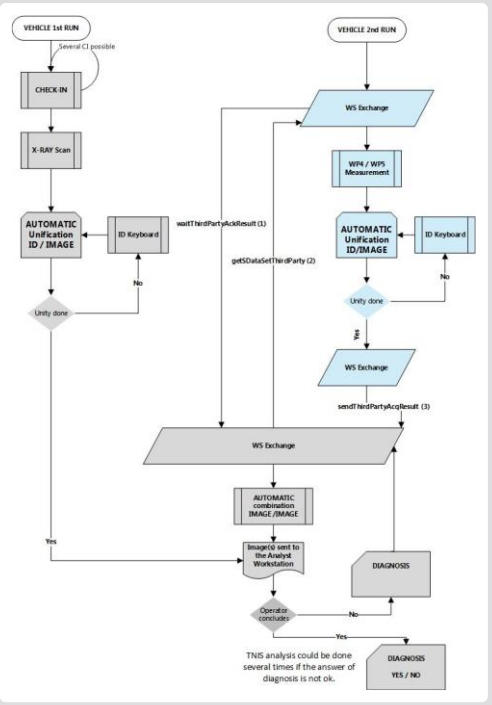
- Definition of a web service interface to support data exchanges amongst technical WPs



Before x-ray scan



During x-ray scan



After x-ray scan

DATA FORMAT

- Constraints:
  - C-BORD requires a data format allowing to carry a **various information**
  - The raw data produced by the different technologies need to be preprocessed in order to make it meaningful to an operator
  - We want to **reuse existing data format** as much as possible

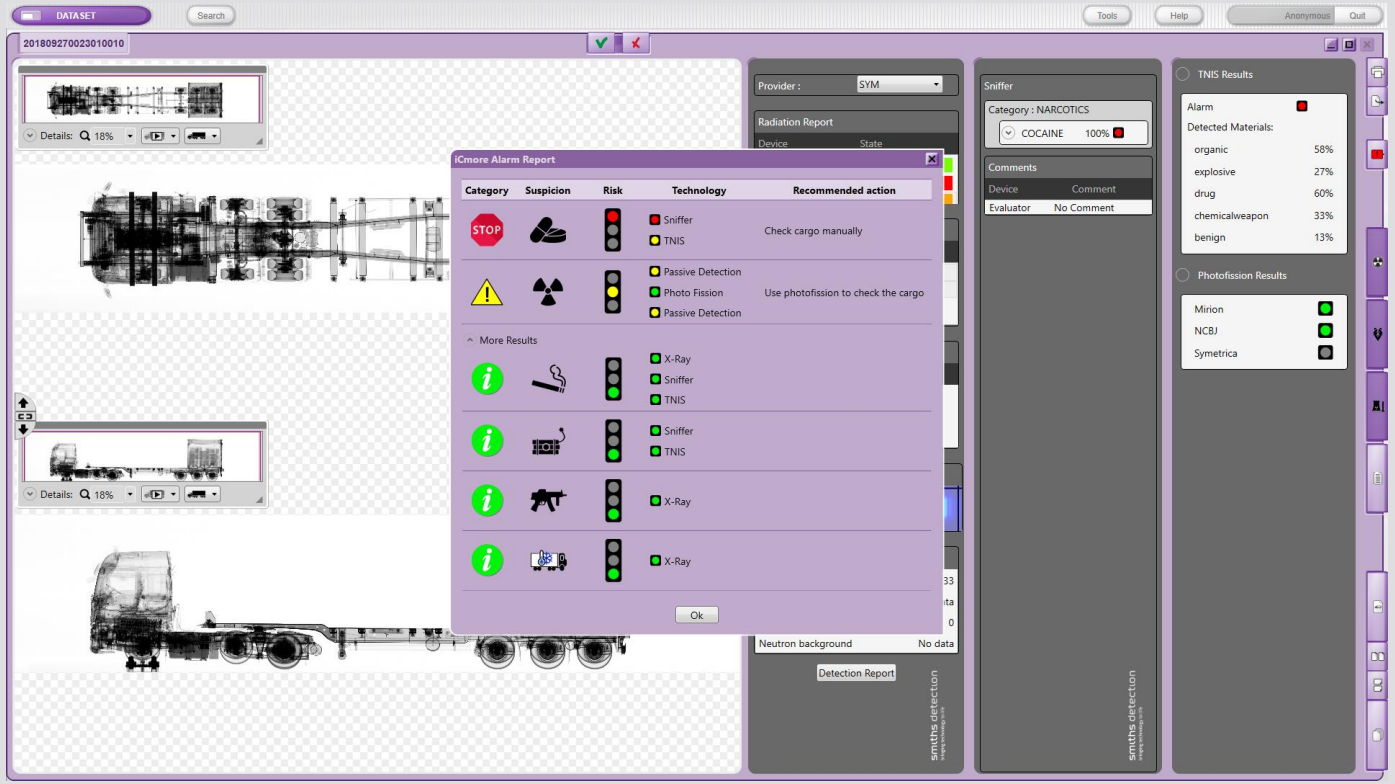
- Existing format
  - DICOS (Digital Imaging and Communications in Security): Derivated from DICOM (broadly used in the medical) is not really used and quite complex. No viewer is available.
  - N.25: As DICOS, it can store a wide variety of data but is difficult to use. Used only in the USA, all N.25 files are not readable by all N.25 viewers.
  - UFF (Universal File Format): Supported by the WCO. Less data type handled than DICOS/N.25 but guarantee that a UFF file is readable by all viewers.

DATA FORMAT

- No existing data format can be used as it is. UFF would have been the best option but it currently allows to store x-ray data only.
- Definition of our own format
  - Based on XML and other standards (TIFF, JPEG, PDF…)
  - Using ANSI/IEEE standards when they are adapted (N42.42 for passive detection)
  - Handling several information levels:
    - L1: suspect or not
    - L2: detailed information humanly readable, helping to take the decision when the system is not able to decide by itself
    - L3: not humanly readable (maintenance data)
  - Open enough to be able to handle data which were not defined at that time
  - Containing data used by other WPs (declared load of the container, position of the container in the image, position of the area where secondary inspection will take place…)

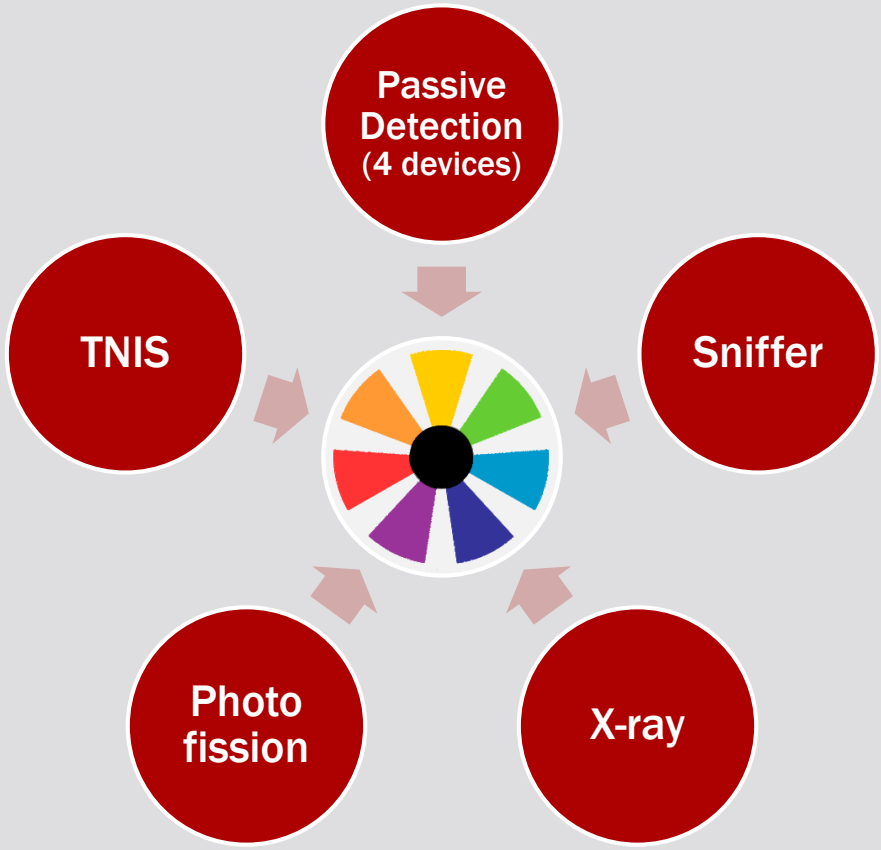
USER INTERFACE

- Based on Smiths Detection commercial software (DaiSy)
- Live demonstration of the UI
  - Overall Alarm report
  - Passive detection (Symetrica and CEA)
  - Sniffer
  - TNIS & Photofission
  - X-ray image improvement
- The example used for demonstration is a combination of results obtained during test in Rotterdam



ON THE FIELD

- Some adjustments have been done
  - Sniffer occurs after registration of the truck on the server
  - In Hungary and Poland we used the internal identifier of the server to share data (less convenient)
  - The process to share data from the server to the devices is not automated
  - Possible to display up to 4 passive detection results for each scan
  - Display of TNIS and Photofission result has been simplified
  - Stationary and mobile x-ray scanners have been connected together
  - Minor bugs remain
- Result from 5 technologies are collected and displayed together (including some features developed for the ACXIS program)



BENEFITS

- Positive feedback received from Customs officers about the unified user interface.
- Feedback collected about the user interface will help Smiths Detection to improve it.
- Integration of passive detection technology is very mature. It will shorten the time required to integrate such a solution with our products.
- More generally the accomplished integration work will help us to integrate any third party solution.
- At some point UFF will integrate passive detection and the work done in C-BORD will help us to do that in the right way.

THANK YOU

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