Presentation

TELS.NET

(MRO-system for aviation industry)

nonotek

Nord-Norsk Teknologi AS

- We develop TELS.NET

Finnsnes (Norway), August 2012

INTRO

TELS.NET is designed and developed to be an MRO system that offers *the most optimal and time-efficient way to manage the planning, implementation and monitoring of Aircraft Maintenance*. TELS.NET is based on the philosophy behind TELS.ACCESS, which has been used in the Scandinavian aviation market since year 2000 with good references. TELS.NET was launched in the market March 1 2012 and is undergoing continuous improvements and extensions of functionality to address market demands and needs. The system is developed by Nord-Norsk Teknologi AS (Nonotek) in collaboration with Aviation Engineering AS.

The philosophy behind TELS.NET is to *streamline work process performed by the aircraft technician in the PART145 organization, and to facilitate planning and monitoring of performed technical maintenance in the CAMO organization*.

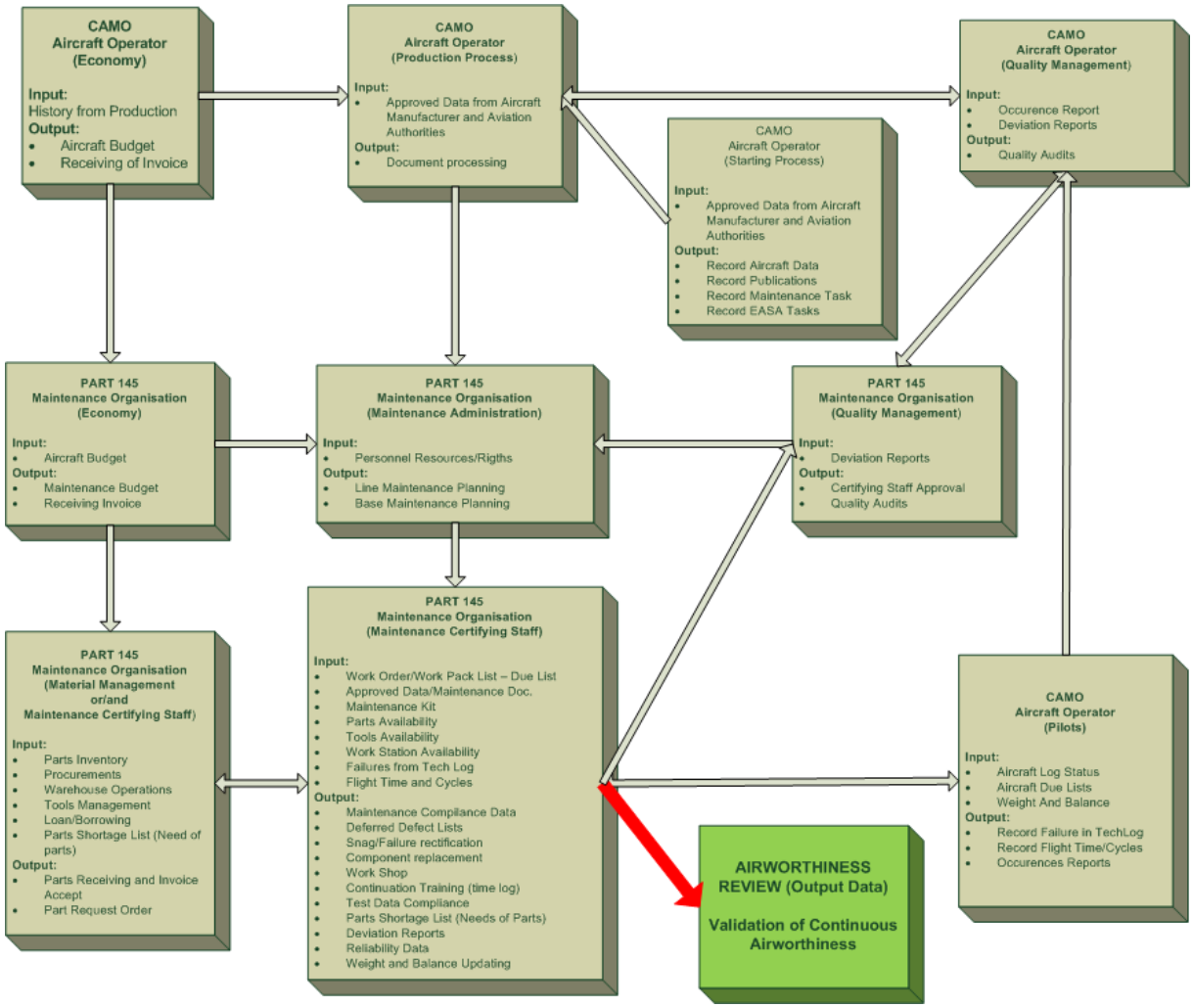
This document gives a short description of the system with its two main modules PART145 and CAMO.

Please contact Nonotek for more information.

GENERAL:

- TELS.NET is an Internet-based system and is offered as a service by Nonotek
    - The system requires no local installation on site at clients
- TELS.NET provides the ability to operate seamless on different bases, regardless of geographic location, with internet access
- TELS.NET supports mobile platforms (PC, touch-based pads and cell phones)
- TELS.NET can be updated in real time and therefore have no backlog of data
- TELS.NET is an electronic data processing system, which prints out reports for manual signing (the system can also offer electronic signature)
- TELS.NET is designed with simple and intuitive user interface that provides access to advanced functionality
- TELS.NET is designed with tight integration with the MOE's operating manual (PART145 organization) that describes the work process of each screen as it is documented in the MOE Similarly offered for CAME (CAMO organization)
- TELS.NET is an adaptive system that learns from previously recorded data
- TELS.NET is modular and can be adapted for use in small and large companies
- TELS.NET have integrated Online Help feature in each screen, which describes the functionality
- TELS.NET has general support for electronic attachment handling
    - In each screen there is support to upload electronic attachments in the form of images, documents, etc., or as links to web addresses (URL)
- TELS.NET can be used either as CAMO system or as PART145 system. But TELS.NET works most optimally if both PART145 and CAMO system modules is used simultaneously

THE BIG IDEA:


CAMO
Aircraft Operator
(Economy)
Input:
History from Production
Output:
Aircraft Budget
Receiving of Invoice
CAMO
Aircraft Operator
(Production Process)
Input:
Approved Data from Aircraft Manufacturer and Aviation Authorities
Output:
Document processing
CAMO
Aircraft Operator
(Starting Process)
Input:
Approved Data from Aircraft Manufacturer and Aviation Authorities
Output:
Record Aircraft Data
Record Publications
Record Maintenance Task
Record EASA Tasks
CAMO
Aircraft Operator
(Quality Management)
Input:
Occurence Report
Deviation Reports
Output:
Quality Audits
PART 145
Maintenance Organisation
(Economy)
Input:
Aircraft Budget
Output:
Maintenance Budget
Receiving Invoice
PART 145
Maintenance Organisation
(Maintenance Administration)
Input:
Personnel Resources/Rigths
Output:
Line Maintenance Planning
Base Maintenance Planning
PART 145
Maintenance Organisation
(Quality Management)
Input:
Deviation Reports
Output:
Certifying Staff Approval
Quality Audits
PART 145
Maintenance Organisation
(Material Management
or/and
Maintenance Certifying Staff)
Input:
Parts Inventory
Procurements
Warehouse Operations
Tools Management
Loan/Borrowing
Parts Shortage List (Need of parts)
Output:
Parts Receiving and Invoice Accept
Part Request Order
PART 145
Maintenance Organisation
(Maintenance Certifying Staff)
Input:
Work Order/Work Pack List – Due List
Approved Data/Maintenance Doc.
Maintenance Kit
Parts Availability
Tools Availability
Work Station Availability
Failures from Tech Log
Flight Time and Cycles
Output:
Maintenance Compliance Data
Deferred Defect Lists
Snag/Failure rectification
Component replacement
Work Shop
Continuation Training (time log)
Test Data Compliance
Parts Shortage List (Needs of Parts)
Deviation Reports
Reliability Data
Weight and Balance Updating
CAMO
Aircraft Operator
(Pilots)
Input:
Aircraft Log Status
Aircraft Due Lists
Weight And Balance
Output:
Record Failure in TechLog
Record Flight Time/Cycles
Occurences Reports
AIRWORTHINESS
REVIEW (Output Data)
Validation of Continuous
Airworthiness

PART145:

- Order module:
  - Purchase Orders for ordering aircraft parts (from approved vendors) with acceptance testing of parts and invoice
    - Each order item can be linked to a aircraft, deal (agreement between maintenance organization and operator / aircraft owner) and budget account
  - Support for trading in foreign currency. The system converts all prices to local currency based on a specified exchange rate (the system can set up a link to a desired exchange site e.g. Norwegian Bank's foreign exchange where you can manually fetch the rates per day)
  - Shipping Invoice is automatically created if you register a Purchase Order for external maintenance as a purchased service
  - Shipping Invoices can also be used manually and separately (outside of Purchase Orders)
  - Supply Orders for ordering supplies (equipment / parts that are not categorized as aircraft components)
  - Ability to record receipt of invoice for other kind of purchases than specified as Purchase Orders or Supply Orders
  - Ability to register outgoing invoices
- Logistics module:
  - Overview of storage for parts (serial number and batch) at various bases and stock locations
    - Serviceable Parts (parts received on Purchase Orders or made serviceable on internal workshops)
    - Unserviceable parts (parts that are removed from Aircrafts)
    - Quarantine parts (parts that have been placed in quarantine due to lack of component certificate)
  - Price of all possible groupings of materials and parts in stock
    - including calculation of inventory value
  - Ability to transfer aircraft components internally between different bases and stock locations within the PART145 organization
  - Administration of Part Numbers
    - Rotable parts (parts with serial numbers)
    - Batch Number parts
    - Definition of replacement parts / interchangeable parts for a selected part number
- Planning Module:
  - Ability to define work shifts in a date range of personnel at work, on call, off-duty
    - The system handles multiple work shifts per day
  - Hangar Visit Plan:
    - Planning Board with an overview of open due items (tasks) with the ability to distribute tasks between resource persons with the necessary certificates on Aircrafts to be maintained

- Ability to allocate tasks between resources within a tolerance period defined in the manual due items
- Graphical representations pr day level in a 14-day period showing the relation between
  - Number of available resource hours (resources at work)
  - Number of estimated resource hours (based on scheduled tasks to be performed before a due date within a tolerance time)
  - Number of planned resources hours
  - Number of actual working hours (documented on the work sheet's continuation training)

- Manual Due List:
  - A list of registered tasks (single task to be performed under the given deadline) with the ability to create new individual tasks
    - Can be defined with a due date and / or cycle (LND, Days, engine parameters, etc.)
    - Can be defined for an aircraft or a component
    - Can be imported from a requirement (see CAMO)
- Auto Order list:
  - A dynamically updated list of unprocessed requirements (planned maintenance) nearing a due date. This includes tasks that are repeated periodically
  - The system generates an estimated due date based on average cycles per day and actual time recorded in the DFR (Daily Flight Record)

- Worksheet module:
  - Work order for planned and unplanned maintenance that supports:
    - Installation and removal of aircraft components with the updating of flight time and the cycles of Landings and various parameters of the rotating parts (engine / APU etc.)
      - Parameters supported: LND, HRS, Ng, Nf, RIN, IMP etc.
      - Supports if parts are part of an assembly in which all or part of an assembly can be part of a component change
    - View / assign graphic positioning of parts on the aircraft
    - Logging of working practices / hours (continuation training) to be billed the client (supports both standard time and overtime work with special rates for this)
    - Support for Carry Forward to Deferred Defect list
      - Deferred maintenance in accordance with MEL Release codes
    - Shortage
      - Support for reporting of needs for aircraft parts to a given date and aircraft so that the logistics manager can ensure that purchases are made on time
  - Administration of signature rights
    - Remarks Signature
    - MEL signature
    - Mechanic Signature

    - CRS Signature
    - Inspection Signature
  - Support for picking due tasks from Maintenance Due List and create Worksheet Items of these
  - Support for picking due requirements from requirement list (requirements are defined in CAMO) and create Work Sheet Items of these
- Reliability Module:
  - All entries in planned work sheet can be categorized / classified based on
    - ATA code (3 levels)
    - Failure code (specifying the type of error)
    - Signification code (an indication of how critical the fault is estimated to be for operation)
    - Detection code (indication of how the error was discovered)
    - Corrective action code (specifying the actions that are performed)
    - Reason code (indication of what caused the error)
  - Update Basis for complete reliability analysis of the various findings (error) over a period of time per aircraft or aircraft type in terms of errors per 1000 HRS
    - The system is prepared for MSG3 analysis methodology that can enable the extension of the flight time between scheduled inspection intervals on the same principle as aircraft manufacturers use for the development of their maintenance programs
- Workshop module:
  - Work Order for maintenance performed in the workshop (repair of aircraft components that is removed from the aircraft (unserviceable parts) and which shall be made serviceable)
  - Logging of working practices / hours (continuation training) to be billed the client (supports both standard time and overtime work on specific rates)
  - Logging of consumption of replacement parts that will be billed the client
  - Support for registration of the capability list
- None CRS activity
  - Ability to record and cost the various tasks and parts consumption (that is not part of the work sheet / workshop (which requires a approved CRS)) to be billed a customer
- Weight & Balance module:
  - Weighing of aircraft
    - During the weighing, one can define the aircraft's actual configuration relative to the dry empty weight
    - The system calculates automatically what is the aircraft's dry empty weight with corresponding C / G
  - Administration of parts / equipment to be installed / uninstalled from aircraft after the aircraft is weighed
    - The system automatically calculates the new weight and C / G, which means you don’t have to weigh the aircraft by changing the configuration
    - This is based on a new concept for TELS.NET developed by Nonotek

- Administration:
  - Personnel registry (employees)
    - Management of Aircraft Certificates
    - User access to TELS.NET based on user rights allocations (user roles) with username and password
  - Administration of aircraft
    - Defining relationships with companies (company relations) who is the owner, operator, CAMO for the specific aircraft
    - Connection to Deal (economic agreement with the operator / owner) and Budget Account
    - Defining the average flight time per day for a date range (the basis for estimating a due date based on a due value for different cycles (LND, Ng, Nf, IMP, etc.)
    - Management of installed aircraft components (e.g. support to set up a new aircraft with existing parts - even in an assembly)
  - Administration of aircraft type
    - Definition of TC Holder
    - Definition of ATA code group (each type of aircraft can have its own ATA code group)
    - Weighing stations (positions on the aircraft on which the weighing is to be performed on the specified aircraft type)
    - ICA Documents (an overview of all received publications related to the particular type of aircraft - managed by the CAMO)
    - Log DFR parameters
      - Configuration of the measurement parameters used to update the daily status of the particular type of aircraft and components that go into / out of the aircraft of this type
        - Measurement Parameter plane: HRS, landing, PAX, RIN, SLI
        - Measurement Parameter for engine 1 - 4: Engine Torque, IMP, ITT, Nf, Ng, Oil Refill
      - Graphical positioning of engine 1-4
  - Administration of business (Company Relations)
    - Common Register for:
      - TC Holder (administration of ATA Group)
      - Document Publisher (administration of the types of documents the issuer, which is used in the Document processing (CAMO))
      - Parts receivers (companies that can receive parts that are shipped on shipping Invoice)
      - Aircraft owner
      - CAMO (company that has technical responsibility for aircraft in the workshop's portfolio)
      - Operator (company operating aircraft in the workshop's portfolio)
      - Vendors (approved suppliers of aircraft components with layout of the contract period)
      - Suppliers (manufacturers of supplies)

        - Ability to classify companies in different categories
- ATA codes
    - Administration of ATA code groups related to different types of aircraft and TC Holders
    - The system can operate with ATA codes in 3 levels within each code group
- Overtime work
    - In conjunction with the continuation Training (worksheets and workshops), it is possible to register activities performed on overtime
    - The system contains a module as well for the registration and certification of other overtime work with a load of the corresponding budget account
        - Each employee is registering his overtime work and a responsible personnel certifies this work
- Travel Expense
    - The system contains a module for the registration and certification of travel expenses associated with the impact of the budget account
        - Each employee is registering his travel expenses and a responsible personnel certifies this expense
- Economy and Budget
    - Support for defining different types of budget accounts for revenues and expenditures in different budget categories
    - Management of budgets
        - Support for setting up time-dependent budgets for each budget account
        - The system reflects the actual consumption balanced against the current budget for each budget account
        - When budgeting a new period, one can compare to the previous period's budget and actual consumption
    - Deal (Consignment stock)
        - The system supports the ability to define a deal as an agreement between PART145 organization and owner / operator of the aircraft
            - All parts to be ordered can be associated with the aircraft deal
            - If the aircraft parts reserved for an airplane is installed on another aircraft, the system can keep track of who owns and shall pay for the plane section
- Maintenance Kits
    - Maintenance Kit is a registry that defines a collection of several kit items that can be a combination of
        - Publication (relating to job description)
        - Parts (which applies to selected part numbers)
        - Tools (e.g. concerning calibration tool)
    - A Maintenance Kit can for instance be included in a publication (see Document Processing under the CAMO) describing a modification on a part / aircraft as part of a requirement
    - The same Maintenance kit can be reused in various publications

- Info module:
  - Due Soon:
    - A real-time updated list of aircraft parts, personnel (certificates, user account), tasks (manual due items and deferred defect items), requirements and agreements (with suppliers, etc.) due on a date in the near future. You can even specify how many days ahead of time that the system will check “due soon” against
  - Document processing
    - See the discussion under CAMO functionality
  - Aircraft Status
    - A screen that continuously monitors the status of all aircrafts in the portfolio
  - Reports
    - There are a number of standard reports with various pre-filters for selecting the data in the reports
      - New types of reports can be prepared if necessary
      - Reports can be customized to comply with aviation authorities' requirements for documentation of results
    - All reports can be printed on printers connected to the terminal (PC, iPad, etc) which the user disposes
      - Some portable devices (such as iPad and mobile phones) require the purchase of additional components from suppliers to support printing on printers
    - All reports can be printed in various formats (e.g. Word, Excel, Adobe - PDF, etc.)
    - All reports can be sent as attachments to e-mail
    - Work Sheet - Part 145 Organization
      - Work Sheet
      - Weight and Balance Report
      - File register
    - Logistics Reports - Part 145 Organization
      - Purchase Order (PO)
      - Rest Orders Each Purchasor
      - Shipping Invoice (SI)
      - Supply Order (SO)(Requisition)
      - Approved Vendor List
    - Unserviceable Parts - Part 145 Organization
      - Unserviceable Parts
      - History of Unserviceable Parts
    - Work Shop Reports - Part 145 Organization
      - Work Shop Report
      - Capability List
      - Authorised Release Certificate (EASA Form 1)
    - Invoice Reports

- Invoice Income
- Customer Invoice Specification
- WorkShop Invoice Specification

- Personnel Reports
  - Work Hours Documentation
  - Travel Expenses
  - Overtime Report
  - Certifying Staff Record
  - Certifying Staff Certificate
  - Man-hours Compliance Lis
  - Man-hours Compliance List – GROUP
  - Continuation Training
  - Continuation Training Time Distribution
- Other administrative reports
  - Different labels can be printed on the envelopes as
  - Other Brands and labels
    - For the labeling of serviceable and unserviceable parts, fire extinguisher and other special equipment etc.

CAMO:

- Used to set up a Maintenance program and to follow up on this after the CRS staff in PART145 organization has signed the appropriate tasks
- Document processing module:
  - Receipt and management of publications received from the publisher Document (TC Holder or legislative authority)
    - A publication form the basis for creating requirements (see below)
    - Received publication can be uploaded as an attachment, either as an electronic file or as a link (URL) to the supplier / factory website
    - Revision Control
      - The system can handle the same publication can be received in the various revisions
    - Publication can be categorized and include:
      - Aircraft
        - Can be associated with one or more aircraft types and possibly different individuals per aircraft
      - Components:
        - Can be associated with the part number (and possibly different serial number intervals per part number)
      - Modification / Repair
        - As described a modification / repair within the categories
          - Major / Minor
          - Design Change / Design repair / Unrepaired Damage
          - Relation to DOA Approval number

        - Maintenance Kits
            - As describes a combination of documents, aircraft parts and special tools
            - Can such be necessary to define in the context of a Modification / Repair
        - Weight & Balance items
            - As described equipment / parts to be installed / uninstalled fly after weighing is performed
        - Manual Tasks Due
            - In describing a simple task (not repetitive)
        - Requirements
            - In describing a repetitive task based on the interval (eg Perform 200 HRS inspection)

- Requirements processing:
    - Describes any repetitive maintenance requirements that are discussed in a treatment publication (see above)
    - Can be defined sequentially so that requirement #2 is applicable only after the Requirement #1 is performed and signed out by the CRS staff
    - Can be defined with sub-requirements related to one or more zones Aircraft
    - Can be included in a collection requirements so that one can define a 50 HRS inspection as part of a 100 HRS inspection
        - Only unique tasks are treated in 50 HRS inspection and 100 HRS inspection if 50 HRS inspection is included in 100 HRS inspection collection
    - Can be defined as accumulative or none-accumulative, which then controls the length of the interval until the next time requirement is due (as presented in the Auto Order List (See Part145))
    - Requirements / sub-requirements can be specified with MHRS estimated to complete, which then affects the planning activities in Hangar Visit Plan (See Part145)
    - Depending on the publication the requirement may apply to
        - Aircraft
            - Define intervals indicating when a requirement applies (e.g. 100 for a 100 HRS inspection, or the 365 Days as an annual inspection)
                - All intervals can be specified with a tolerance of + / -
            - For each aircraft (as defined in the Document processing module), one can define the start and stop the interval that the requirement to apply
                - One can for example specify that a 100 HRS requirement shall only apply when the aircraft has produced between 1000 and 2000 HRS
        - Components
            - Define intervals indicating when a component requirements will apply (e.g. 100 for a 100 HRS inspection, or the 365 Days as an annual inspection)

        - All intervals can be specified with a tolerance of + / -
    - A requirement can be defined for a serial number or serial number within a group of start and stop intervals
        - One can for example specify that a 100 HRS requirement shall apply only when the component has produced between 1000 and 2000 HRS
    - Each component requirement can specify action to be taken regarding which aircraft type the component is installed on
    - Mod / Repair Task
        - If the requirement is defined as Design Change, one can define one or more Modification / repair tasks as defined in the publication
        - If the requirement is defined as Inspection Check, one can define one or more Modification / repair tasks as defined in any publication. The system will then arrange and treat these as Post Mod / Repair Tasks and present them in the Auto Order List only after the modification (design change) is performed

- Electronic Flight Bag
    - A separate downscaled TELS module that is specifically designed for network access (iPad, etc) or touch-based phones (iPhone, etc.)
    - Used by the pilot:
        - Recording of flight time (Daily Flight Record - DFR). Whether per leg or total time per date
        - Overview of the next scheduled maintenance on selected aircraft
        - Registration of findings supporting to operate the aircraft based on a limited release MEL code and a MEL signature
        - Weight&Balance form - displaying the status of the aircraft weight and balance
        - Overview of available technical personnel (based on work shift list and relevant Aircraft Certificate) in the Part-145 organization
- Tech log
    - A correction document showing all the faults and fixes performed by the PART145 organization
    - Deferred Defect list that shows all of findings, which are not part of planned maintenance, but that is signed out and released by the MEL certified personnel to fly with restrictions
    - Daily Flight Record is used to record flight time (and engine data) per flight or per date
    - Weight Balance & showing the status of the aircraft weight and balance
    - Maintenance Due List showing an overview of planned maintenance
- Reports
    - As discussed in PART145 there are a number of standard reports with various pre-filters for selecting the data in reports

- Airworthiness Review Reports:
  - Maintenance Program - Aircraft Status Page
  - Maintenance Program - Airframe Inspection Program
  - Maintenance Program - Component Inspection Program
  - Maintenance Program - Airframe S.B. / A.D. Status
  - Maintenance Program - Component S.B. / A.D. Status
  - Maintenance Program - Engines Component Inspection Program
  - Maintenance Requirement List
- CAMO Reports:
  - Aircraft Task Compliance List - Authority Requirements
  - Aircraft Task Compliance List - Manufactures Requirements
  - Component Log Cards Installation and Removal
  - Component Log Card Task Compliance List
  - Component Change List (Batch)
  - Component Change List (Serial No)
  - Weight and Balance Report
  - Engine Log Book
- Tech Log – CAMO Organization
  - Daily Flight Record
  - Tech Log
  - Deferred Defect List
  - Work Order
- New types of reports can be prepared if necessary
  - Reports can be customized to comply with aviation authorities' requirements for documentation of results

Please don't hesitate to contact Nonotek for more information, or a web-based demo/presentation.

The system can be presented over net by using remote desktop services i.e. TeamViewer or Mikogo in combination with skype.

Best regards

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