LOGICAL

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Work Package 4: Programming and Testing Cloud Computing in Logistics

BOLOGNA – LEPZIG Business Case

BOLI

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The Business Case at a Glance

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- Multimodal transport service involving traffic of general cargo in swap bodies and containers from Italy to Germany.
- It connects major nodes of Emilia Romagna and Leipzig Regions; Interporto Bologna, Verona (IT) – Munich, Leipzig Intermodal Terminal and Leipzig Halle Airport (DE)

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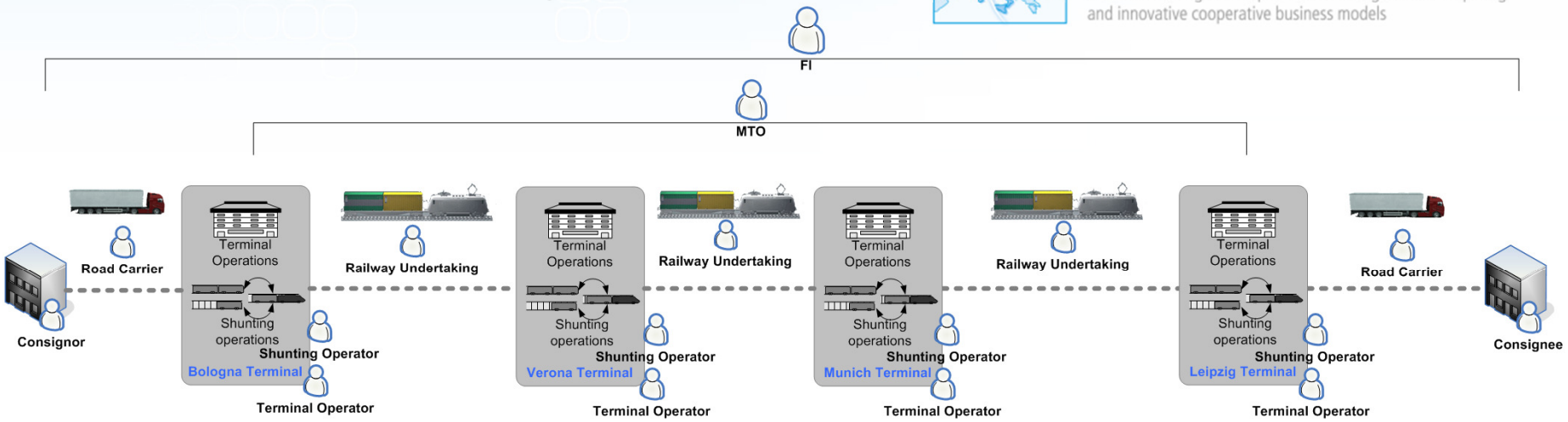
BOLI AS IS scenario



- Interporto Bologna – as a reference hub for the entire Region – consolidates the cargo coming from several regional origins as well from the South of Italy (as almost all the traffic coming from the South passes through) and it constitutes the terminal of origin.
- As it is shown in the figure, the transport starts with the first mile transport (door service) performed by road carriers, that moves the cargo from the consignor warehouse to the terminal of departure (Interporto Bologna).

BOLI AS IS scenario

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- The transport service has 2 intermediate stops: Verona Terminal and, then, Munich Terminal; in both cases, the stops are "justified" by the "business scenarios", thus the train is handled and part of the cargo is unloaded while new cargo is loaded.
- After the departure from Munich, the train runs directly to Leipzig, where the cargo is distributed in the surrounding area, including the nearby logistics hub of Leipzig Halle.
- The average transit time of the transport between Bologna and Leipzig is about 5 days (including the intermediate stops in 2 terminals).

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Analysis of the AS IS situation

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- The current situation scenario has been analysed in terms of:
  - Physical Flow
  - The three transport phases (Planning, execution, completion)
- The information flow for the three transport phases has been depicted as well as the exchange of messages between the involved stakeholders

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Stakeholders involved

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- Logistics and Transport Service providers (SMEs):
  - Road Carriers;
  - Terminal Operators;
  - Shunting Operators;
  - Railway Undertaking Companies.
- Freight Service Integrators:
  - Freight Integrators;
  - Multimodal Transport Operators.
- Logistics Service Clients (not directly involved as users):
  - Consignor
  - Consignee

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BOLI TO BE – The cloud based solution

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- IBI brings into the project the **Corridor Supply Chain Management Platforms** addressing two stakeholder communities; those of cargo managers and transport means operators. The twofold approach followed addresses:
  - the Strategic Network Design and Service Providers management and
  - the Operational cargo Management.
- In this context, the two interconnected platforms provide multimodal freight transport corridors through CoSPaM and multimodal freight transport chains through M2TC.

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Multimodal Corridor Design

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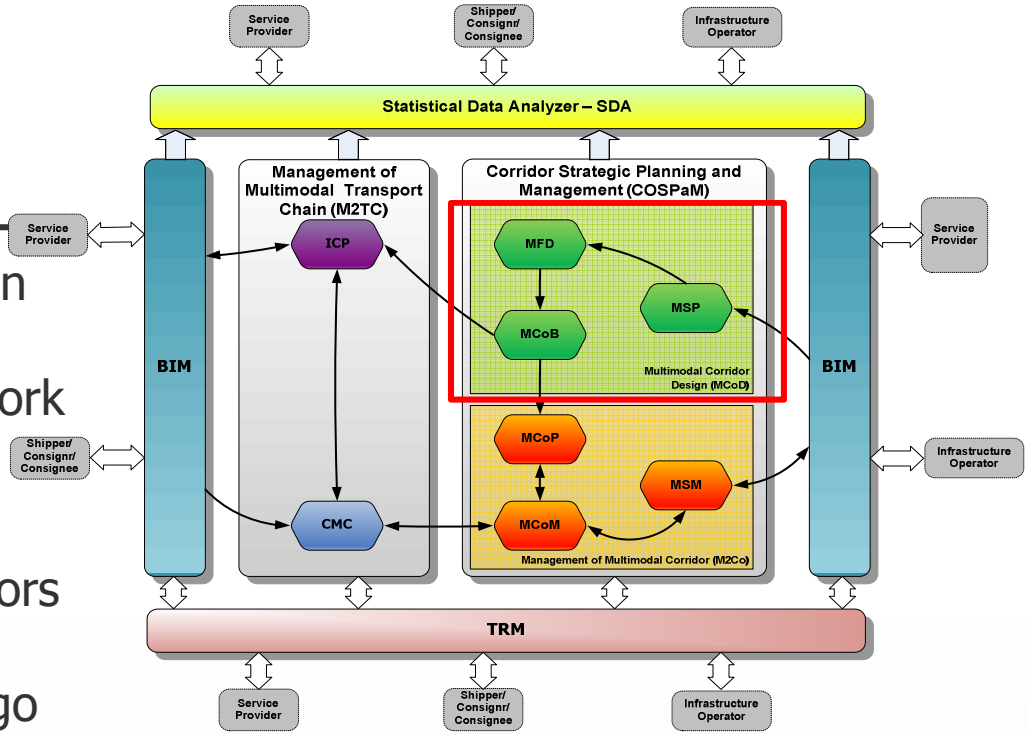
- **Multimodal Services Publishing – MSP**: supports the Services Providers towards the open publication and promotion of their services through automatic (electronic document exchange) and manual methods
- **Multimodal Framework Design – MFD:** facilitates Corridor Managers in the development of corridor frameworks tailored to specific network requirements
- **Multimodal Corridor Building – MCoB:** provides collaborative corridors that may be used for transport (shipment oriented) or corridor (cargo flow oriented) planning and monitoring



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Management of Multimodal Corridor

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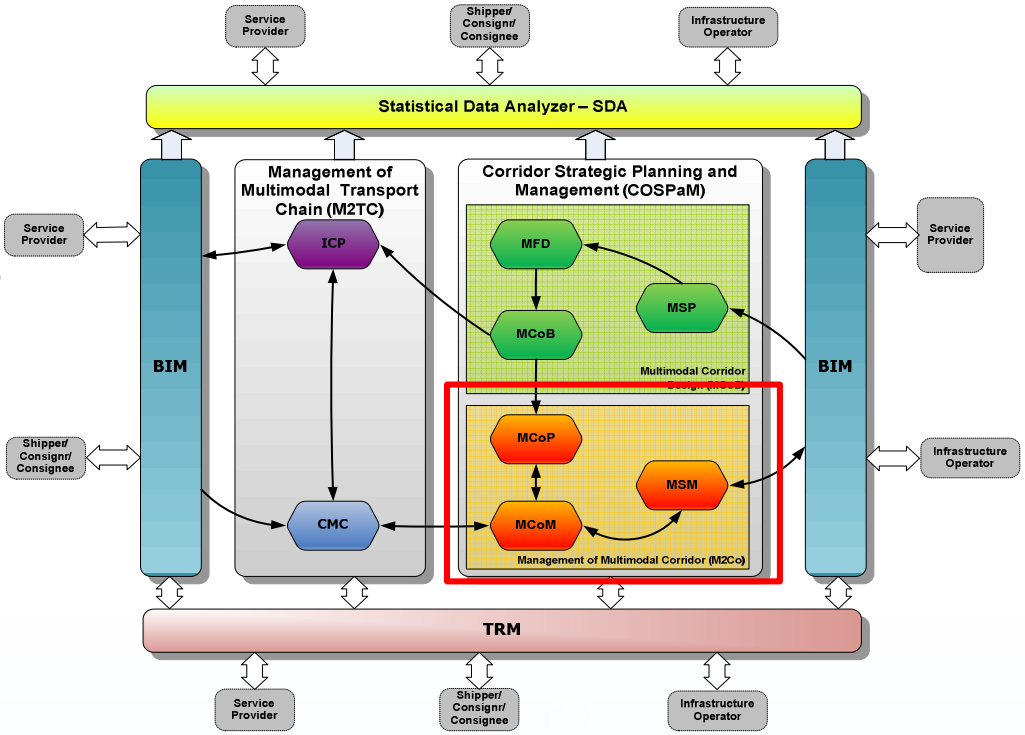
- **Multimodal Corridor Planning – MCoP:** supports the preparatory activities between service providers and corridor managers for the exploitation of corridors
- **Multimodal Corridor Monitoring – MCoM:** the Tracking and Tracing of cargo flows along corridors
- **Multimodal Services Monitoring – MSM:** supports the automated status collection from service providers through a smart subscription mechanism, using electronic documents exchange



Management of Multimodal Transport Chains (M2TC)

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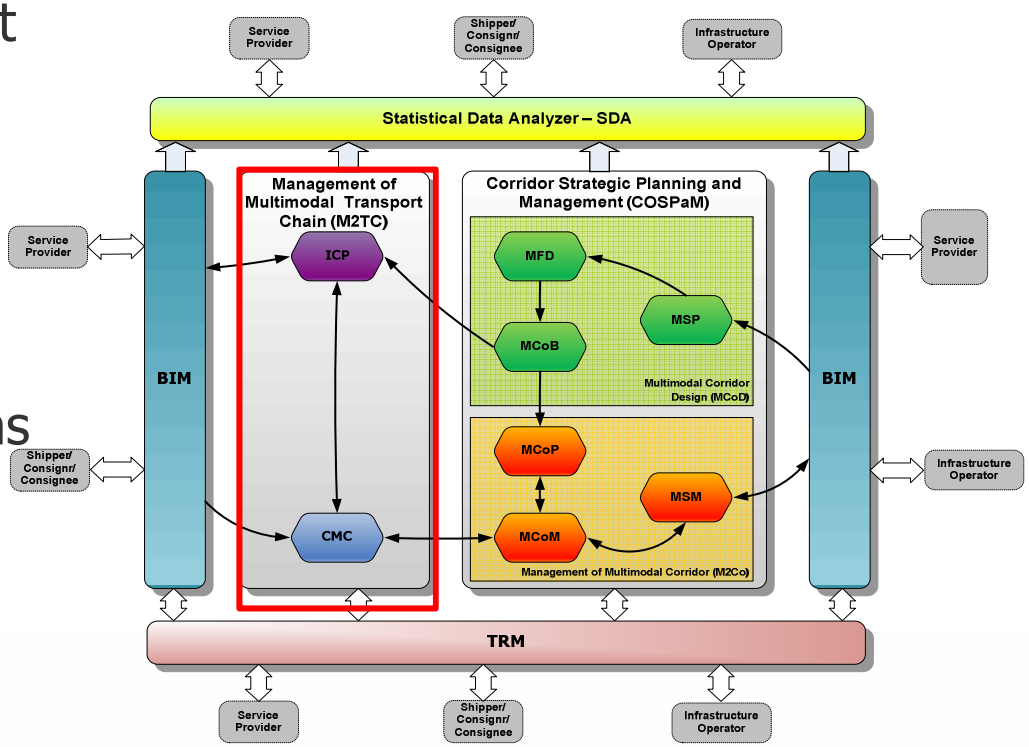
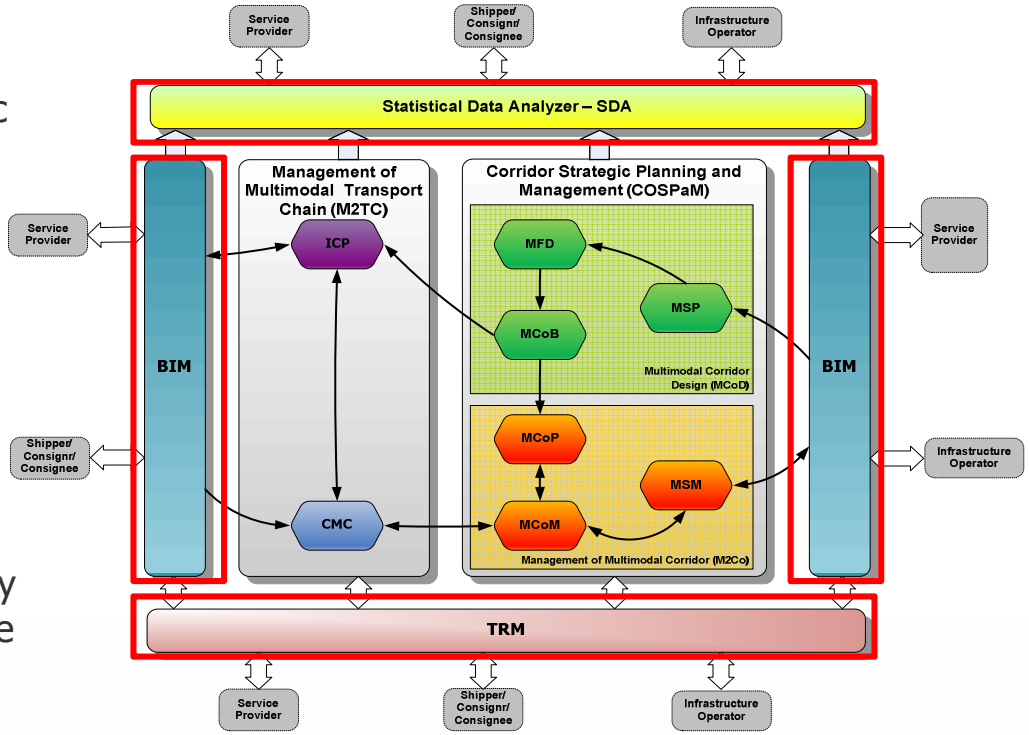
- **Intermodal Chain Planning – ICP:** supports the cargo responsible bodies, e.g. freight integrators towards the planning of D2D freight transport chains
- **Chain Monitoring and Control – CMC:** monitor and control of D2D transport chains by providing a user friendly Tracking and Tracing functionality



Horizontal modules

- **Global Gateway - G2:** effective and secure administration of all the input/output data and business environment
- **Business Interchange Manager - BIM**: allows the interaction of the private and public entities through manual and automatic exchange of structured documents using different information (e.g. XML, EDI, ASCII, Excel) and communication protocols (e.g. FTP, SMTP, SOAP)
- **Transport Reporting Manager – TRM:** provides accessibility to transport added value information for various stakeholders involved in the transport chain
- **Statistical Data Analyzer – SDA:** facilitates the exploitation of the vast quantity of data collected through the operation of the two platforms and supports the decision making of the stakeholders



Relation of BOLI with LOGICAL use cases

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- **Use case 2: Integration, synchronisation and sharing of data (optional)**. Transport services covering Leipzig region cloud could be made accessible to Logical and synchronised with the services that are stored in the Bologna cloud and vice versa (i.e. two way synchronization).

- **Use case 3: Virtual Market place (optional)**. IBI platform could provide the transport services of Bologna region to the LOGICAL cloud. These transport services can be made available , as the transport service supply, to the Virtual market place of LOGICAL cloud. A similar approach should be followed for the transport services of the Leipzig region.

- **Use case 4: Management and optimisation of collaborative business activities**. The multimodal transport management platforms of IBI will be used for planning, execution and monitoring of multimodal transport chains. The Corridor Strategic Planning and Management platform is used for the publishing of the transport providers' services and the monitoring along the multimodal corridor that will be established for this business case between Bologna - Leipzig regions.

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Preparation Phase - Steps

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1. During the preparation phase the transport services providers (i.e. road haulers) publish their transport services in the platform of Interporto Bologna. Each transport service provider uses its own interfaces specified and agreed with IBI, within the platform of IBI (CoSPaM).
2. Transport services are verified in the IBI platform and are also published to the LOGICAL cloud. Other backend systems (as in the case of Leipzig) through the intercloud linkage have access to this information.
3. In the same manner the transport service providers (i.e. road haulers) for the last mile have entered their transport service definitions in the Logical cloud.
4. As soon as the transport services are stored into the Logical cloud other backend systems can access them through the appropriate interfaces.
5. Finally the **transport services providers for the last mile in Leipzig** have been registered in the platform of IBI.

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Planning Phase – Steps (1/2)

1. The shipper in Italy, registered in the LOGICAL cloud, submits a Booking message for a multimodal transport.
2. This message is transmitted through the LOGICAL cloud to the IBI platform.
3. The Freight forwarder who is a registered user of the IBI platform receives the booking and initiates the multimodal transport planning functionality. (by using the IBI platform he selects the transport services that are defined internally in the platform of IBI and those that have been collected via LOGICAL cloud)
4. ***The latter are related to the candidate transport service providers (i.e. road haulers) for the last mile that operate in the wider Leipzig area.***
5. Using the above information the freight forwarder builds the appropriate intermodal transport chain and then sends individual booking to each one transport service provider.

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Planning Phase – Steps (2/2)

6. The freight forwarder using the IBI platform prepares and sends back to the shipper a multimodal transport booking confirmation to signal the acceptance of the original request.
7. The information is submitted automatically from the IBI platform, via the LOGICAL cloud to the Shipper.
8. As soon as the transport is ready to begin, the Shipper sends a multimodal transport instruction to the forwarder via the LOGICAL cloud/ IBI system who instructs each one of the transport services providers about the details of the transport.
9. ***The last mile service provider in Leipzig is notified through the appropriate interfaces supported by the LOGICAL cloud.***

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BOLI – TO BE

Execution Phase - Steps

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1. During the execution of the transport all statuses are collected and submitted by the Transport Service Providers to the IBI platform.
2. The freight forwarder can access the IBI platform and view the collected status information for each part of the transport chain.
3. In addition the shipper can access the IBI platform and view the status of the transport.
4. Latest statuses for a specific consignment can be provided via web services to the LOGICAL cloud on a request / response basis so that can be accessed to the users of the cloud.
5. ***Regarding the German road hauler the statuses collected for arrival in the final destination and proof of delivery, managed by the backend of Leipzig, are expected to be made available to the LOGICAL cloud and through appropriate interfaces (web services) to the IBI platform.***

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Dependencies

- Provision of a backend system in the Leipzig area capable of performing booking and transport monitoring for the last mile transport, with the development of appropriate interfaces for
  - Publishing Leipzig transport services to LOGICAL/IBI platform,
  - Receiving requests for booking/ instructions,
  - Provision back booking confirmations and transport statuses in the geographical area of responsibility.
- Development and provision of the tools of the cloud infrastructure needed for the integration of Leipzig and IBI backends (access control and security, user management, user/organisation synchronisation) ***Common for all regional clouds***.
- Development of a front end in the LOGICAL cloud that will be connected to IBI and Leipzig backends and provide status information for a specific consignment to LOGICAL cloud for users not registered in any of the backends.
- Support us in the technical aspects related to LOGICAL cloud

Added value of the BOLI case for LOGICAL and Central Europe Programme

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- ✓ Support transnationality
- ✓ Provision of a D2D co-modal solution
- ✓ Development of an interoperable solution
- ✓ Enhancement of competitiveness of multi-modal hubs
- ✓ Promotion of business cooperation
- ✓ Involvement of several actors
- ✓ Existence of cargo flow
- ✓ Real needs for improvements in transport chain management
- ✓ Major intermodal nodes involved

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Thank you

Fabio Cartolano

IB Innovation

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