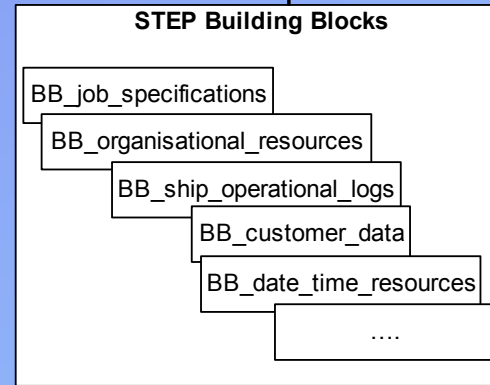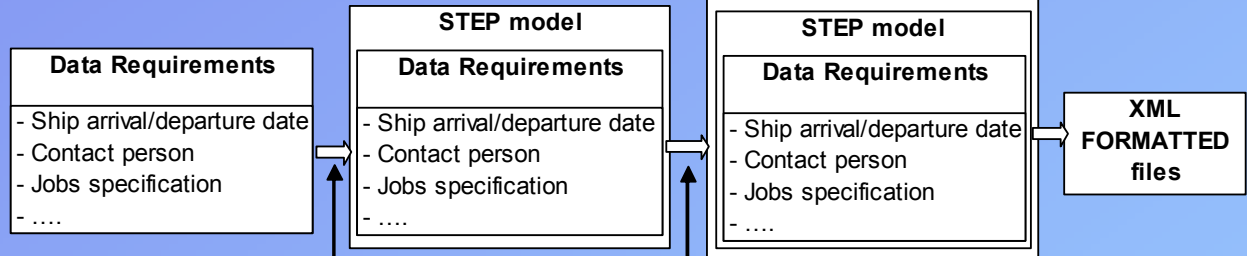# Production Systems Planning, Control & Networking

E-business and E-work Applications
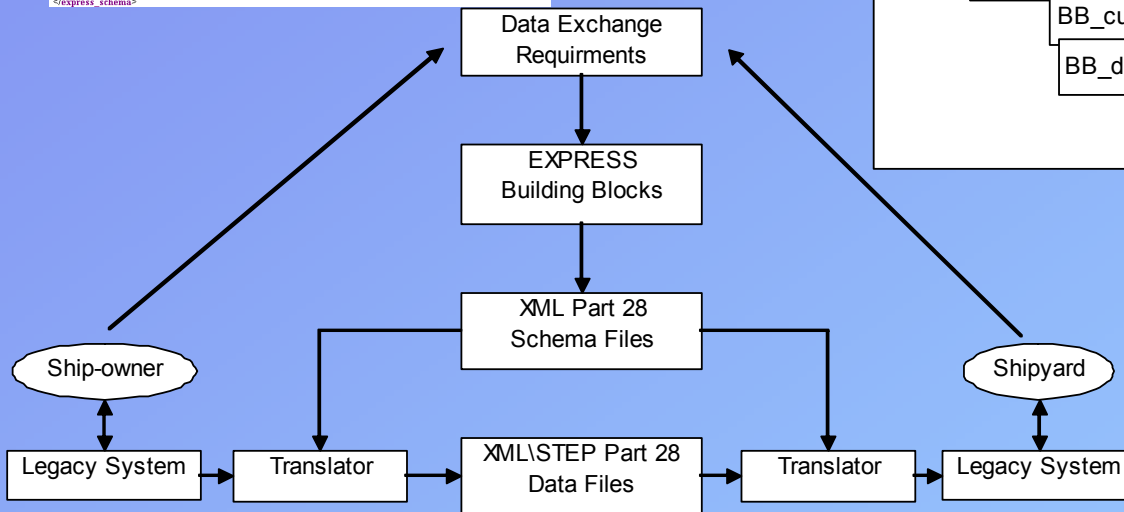### Information modeling for the electronic operation in maritime case supply chain

```
<express_schema>
- <embedded_remark>
    The entities declared in this schema can be used to describe the initial information flow between a shipyard and a shipowner.
  </embedded_remark>
  <schema_id>Enquiries_data_model</schema_id>
- <interface_specification_block>
  - <use_from>
      <schema_ref>Enquiries_data_import</schema_ref>
    </use_from>
  </interface_specification_block>
- <type_decl>
    <type_id>Main_machinery_type</type_id>
  - <underlying_type>
    - <enumeration>
        <enumeration_id>DIESEL_ENGINE</enumeration_id>
        <enumeration_id>FAST_SPEED</enumeration_id>
        <enumeration_id>ELECTRICAL</enumeration_id>
        <enumeration_id>OTHER</enumeration_id>
      </enumeration>
    </underlying_type>
  </type_decl>
- <entity_decl>
  - <embedded_remark>
      This entity describes the request of a potential customer for equipment or services or both.
    </embedded_remark>
    <entity_id>Enquiry</entity_id>
  + <subtype_of></subtype_of>
  - <explicit_attr_block>
    - <explicit_attr>
      - <embedded_remark>
          The date that the ship owner desires the ship to be in the shipyard.
        </embedded_remark>
        <attribute_id>Ship_arrival_date_from</attribute_id>
      + <base_type></base_type>
      </explicit_attr>
    + <explicit_attr></explicit_attr>
    - <explicit_attr>
      + <embedded_remark></embedded_remark>
        <attribute_id>Terms_and_conditions_of_the_repair</attribute_id>
      + <base_type></base_type>
      </explicit_attr>
    </explicit_attr_block>
  </entity_decl>
</express_schema>
```
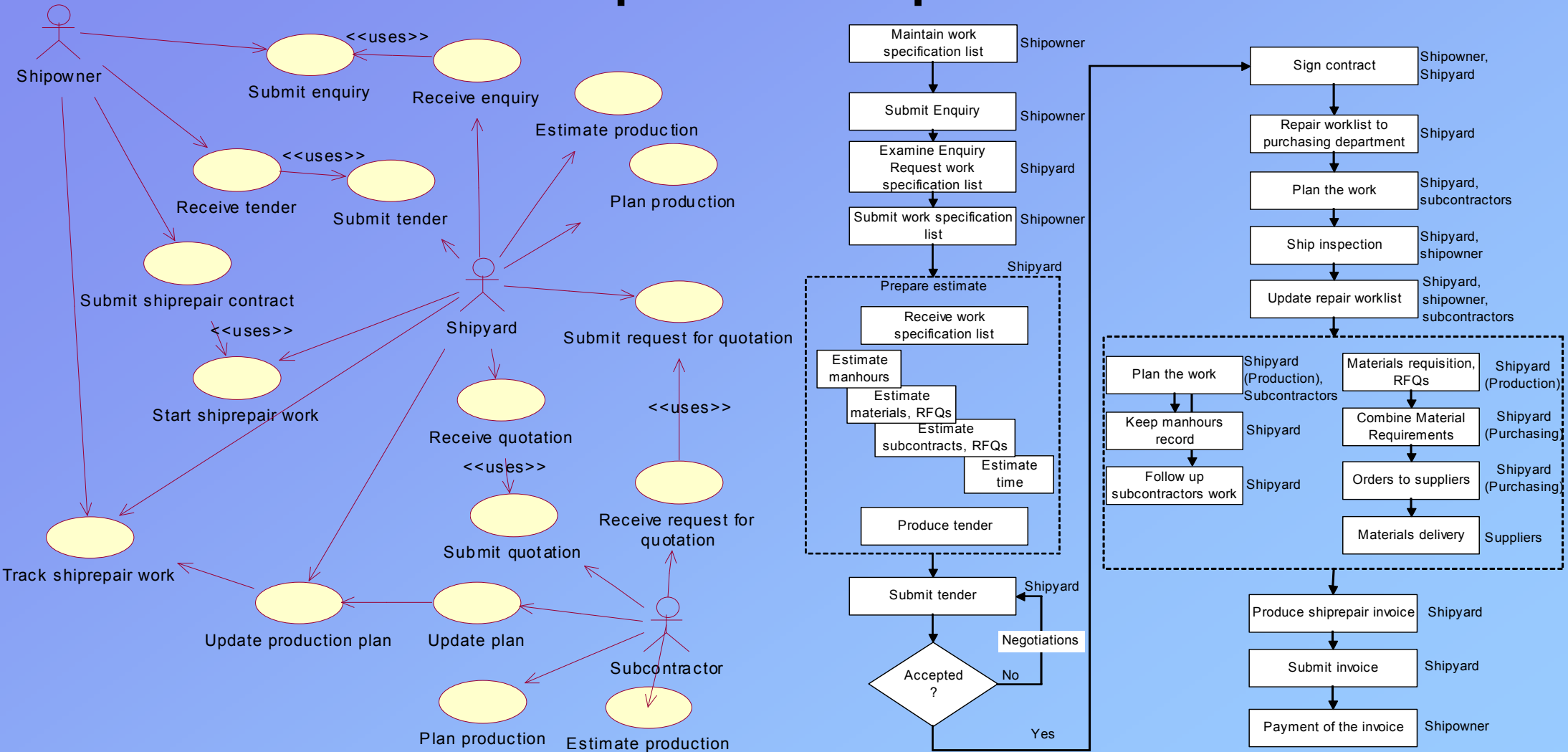
Data Requirements

- Ship arrival/departure date
- Contact person
- Jobs specification
- ….

STEP model

Data Requirements

- Ship arrival/departure date
- Contact person
- Jobs specification
- ….

XML REPRESENTATION

STEP model

Data Requirements

- Ship arrival/departure date
- Contact person
- Jobs specification
- ….

XML FORMATTED files

STEP Building Blocks

BB_job_specifications

BB_organisational_resources

BB_ship_operational_logs

BB_customer_data

BB_date_time_resources

….

PART 28 specification

EXPRESS model	XML part 28 mapping
SCHEMA persons;	<schema_decl>
ENTITY person;	<schema_id>
name : STRING;	persons
END_ENTITY;	</schema_id>
	<entity_decl>
END_SCHEMA;	<entity_id>
	person
	</entity_id>
	<explicit_attr_block>
	<explicit_attr>
	<attribute_id>
	name
	</attribute_id>
	<base_type>
	<string/>
	</base_type>
	</explicit_attr>
	</explicit_attr_block>
	</entity_decl>
	</schema_decl>

Data Exchange Requirments

EXPRESS Building Blocks

XML Part 28 Schema Files

Ship-owner

Shipyard

Legacy System → Translator → XML\STEP Part 28 Data Files → Translator → Legacy System

Makris, S., V. Xanthakis, D. Mourtzis and G. Chryssolouris, "On the information modeling for the electronic operation of supply chains: A maritime case study", Robotics and Computer-Integrated Manufacturing, (Vol.24, No.1, 2008), pp. 140-149.

Production Systems Planning, Control & Networking

E-business and E-work Applications
Functional decomposition of cooperation in maritime

Production Systems Planning, Control & Networking

E-business and E-work Applications
Internet based Collaboration

Makris, S., D. Mourtzis, N. Papakostas, G. Chryssolouris and I. Gaviotis, "An e-Collaboration Software Framework for the Ship Repair Supply Chain", Proceedings of the 12th International Conference on Computer Applications in Shipbuilding-ICCAS, Busan, -Korea, (August 2005) pp. 717-727.

Production Systems Planning, Control & Networking

E-business and E-work Applications
Standards Based Data Modeling