조선산업의 CAD/CAM & PLM

AVEVA의 조선산업 지향 SOLUTION

백창현
Project Manager, PLM Solutions
Korea-Japan Division
- AGENDA -

1. AVEVA의 기술개요
2. AVEVA의 조선용 CAD
3. AVEVA의 조선용 PLM
4. AVEVA의 업종 장점
**AVEVA’s evolutionary development**

- Allows you to control and protect your data investments
1. AVEVA Technology

- Object-based Technology

- 2D drawings, specs
- 3D model, schematic
- Model Data
- XML Data
- Doc. Data
- Object Association
- Object Management

- Access
- Security
- Revision control
- Collaboration
- Process definition
- Workflow rules
- Audit trail

www.aveva.com
Any third party application
Exchanging data with the
Technology platform
According to the same
Principles as AVEVA
Applications.

Existing Oracle
Based Solutions for:
• In-House Program
• Project Management
  (using gateway technology)

 ➔ .NET solutions focused on
 flexible modular solutions
## Shipbuilding Customers – on order dwt January 2007

<table>
<thead>
<tr>
<th>No.</th>
<th>Company Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Hyundai Heavy Industries</td>
</tr>
<tr>
<td>2</td>
<td>Universal Shipbuilding Corporation</td>
</tr>
<tr>
<td>3</td>
<td>Daewoo Shipbuilding Marine Engineering (DSME)</td>
</tr>
<tr>
<td>4</td>
<td>Samsung Heavy Industries</td>
</tr>
<tr>
<td>5</td>
<td>Hyundai Samho Heavy Industries</td>
</tr>
<tr>
<td>6</td>
<td>Dalian New Shipbuilding Heavy Industries</td>
</tr>
<tr>
<td>7</td>
<td>Shanghai Waigaoqiao Shipbuilding</td>
</tr>
<tr>
<td>8</td>
<td>Hyundai Mipo Dockyard</td>
</tr>
<tr>
<td>9</td>
<td>STX Shipbuilding</td>
</tr>
<tr>
<td>10</td>
<td>Mitsui Engineering and Shipbuilding</td>
</tr>
<tr>
<td>11</td>
<td>Oshima Shipbuilding</td>
</tr>
<tr>
<td>12</td>
<td>Imabari Zosen</td>
</tr>
<tr>
<td>13</td>
<td>IHI Marine United</td>
</tr>
<tr>
<td>14</td>
<td>Nantong COSCO KHI Engineering</td>
</tr>
<tr>
<td>15</td>
<td>Jiangnan Shipyard</td>
</tr>
<tr>
<td>16</td>
<td>Tsuneishi Shipbuilding</td>
</tr>
<tr>
<td>17</td>
<td>Sungdong Shipbuilding</td>
</tr>
<tr>
<td>18</td>
<td>Namura Shipbuilding</td>
</tr>
<tr>
<td>19</td>
<td>Nantong Rongsheng Shipbuilding</td>
</tr>
<tr>
<td>20</td>
<td>Bohai Shipyard</td>
</tr>
<tr>
<td>21</td>
<td>Hanjin Heavy Industries</td>
</tr>
<tr>
<td>22</td>
<td>New Times Shipbuilding</td>
</tr>
<tr>
<td>23</td>
<td>Hudong Zhonghua Shipyard</td>
</tr>
<tr>
<td>24</td>
<td>Sasebo Heavy Industries</td>
</tr>
<tr>
<td>25</td>
<td>Koyo Dockyard</td>
</tr>
<tr>
<td>26</td>
<td>Kawasaki Shipbuilding Corporation</td>
</tr>
<tr>
<td>27</td>
<td>Mitsubishi Heavy Industries</td>
</tr>
<tr>
<td>28</td>
<td>China Shipbuilding Corporation</td>
</tr>
<tr>
<td>29</td>
<td>SLS Shipbuilding</td>
</tr>
<tr>
<td>30</td>
<td>Shin Kurushima Dockyard</td>
</tr>
<tr>
<td>31</td>
<td>Sumitomo Heavy Industries</td>
</tr>
<tr>
<td>32</td>
<td>Sanoyas Hishino Meisho Corporation</td>
</tr>
<tr>
<td>33</td>
<td>New Century Shipbuilding</td>
</tr>
<tr>
<td>34</td>
<td>Shanghai Chengxi Shipbuilding</td>
</tr>
<tr>
<td>35</td>
<td>Guangzhou Shipyard International</td>
</tr>
<tr>
<td>36</td>
<td>Tsuneishi Heavy Industries Cebu</td>
</tr>
<tr>
<td>37</td>
<td>Onomichi Dockyard</td>
</tr>
<tr>
<td>38</td>
<td>Odense Steel Shipyard</td>
</tr>
<tr>
<td>39</td>
<td>Brodospit Shipyard</td>
</tr>
<tr>
<td>40</td>
<td>Jinling Shipyard</td>
</tr>
<tr>
<td>41</td>
<td>Zhejiang Shipbuilding</td>
</tr>
<tr>
<td>42</td>
<td>Jiangsu Yangzijiang</td>
</tr>
<tr>
<td>43</td>
<td>SPP Shipbuilding</td>
</tr>
<tr>
<td>44</td>
<td>Yangzhou Dayang Shipbuilding</td>
</tr>
<tr>
<td>45</td>
<td>Szczecinska Nowa Stocznia</td>
</tr>
<tr>
<td>46</td>
<td>Daewoo Mangalia</td>
</tr>
<tr>
<td>47</td>
<td>Jiangsu Eastern Shipyard</td>
</tr>
<tr>
<td>48</td>
<td>Kanda Shipbuilding</td>
</tr>
<tr>
<td>49</td>
<td>Iwagi Zosen</td>
</tr>
<tr>
<td>50</td>
<td>Shin Kochi Juko</td>
</tr>
</tbody>
</table>

Source: Lloyd’s Register Fairplay, World Shipping Encyclopaedia January 2007
2. AVEVA의 조선용 CAD

AVEVA Marine Portfolio

Any third party application exchanging data with the Technology platform according to the same principles as AVEVA applications.

3D Models
Schematic models (.NET applications)

2D and 3D integration:
- AVEVA Marine Diagrams
- AVEVA P&ID 3D Integrator

3D Design:
- AVEVA Outfitting
- AVEVA Global
- AVEVA Multi-Discipline Supports
- AVEVA Clash Manager
- AVEVA Room Design
- AVEVA Cable Design
- AVEVA Laser Model Interface
- AVEVA Pipe Stress Interface

3D Visualisation and Collaboration:
- AVEVA Review
- AVEVA ReviewShare

Information Access
Information Integrity
Information Management (.NET applications)

Lifecycle Solutions:
- AVEVA NET

3rd Party Integration and Gateways:
- Engineering applications
- 2D Schematic applications
- 3D Design applications
- Document management systems
- Commissioning, maintenance, and asset management system

2D and 3D Hull Design and Production (.NET applications)

Design:
- AVEVA Initial Design
- AVEVA Hull Structural Design
- AVEVA Hull Detailed Design

Fabrication and Production:
- AVEVA Hull Drafting
- AVEVA Assembly Planning
- AVEVA Hull Weld Planning

AVEVA Marine
AVEVA Marine: the ‘doing’ products

AVEVA Marine Products

Initial Design
- Geometry & Compartment
- Hydrostatics
- Hydrodynamics

Common Graphical User Interface
- Marine Diagrams
- Hull Structural Design
- Hull Detailed Design
- Outfitting
- Multi discipline supports - MDS
- Cable
- Room Design
- Assembly & Weld planning
- Review
- Clash Manager

Common Database
- Catalogues
- PML, Microsoft .NET
- Customization
- XML Gateways
- Dabacon
- 2D Drawing
- SQL
- Data Management
- Global
# AVEVA Marine: Design and Fabrication scope

## 1. AVEVA의 조선용 CAD

### AVEVA Marine: Design and Fabrication scope

**Marine Diagrams**
- P&ID, Cable, and HVAC diagrams
- Consistency Checks

**Initial Design**
- Hull form
- Compartment arrangement
- Hydrostatic analysis
- Hydrodynamic analysis
- Hull Form, Bulkheads, Decks & Compartments

**Hull Detailed Design**
- Drawings and data for hull structural:
  - Design
  - Detailing
  - Production

**Assemblies**
- Drawings and data for:
  - Build Strategy
  - Assembly fabrication
  - Planning interface

**Outfitting**
- Drawings and data for:
  - Equipment, Pipes, Vents, & Fittings plus outfit structure:
    - Design
    - Detailing
    - Production

**Outfitting Piece-parts**
- Hull Structural Design
  - Class drawings
  - FEA interface

**Weld Planning**
- Identification and Specification of:
  - Welds
  - Welding processes

**Assembly Planning**
- Share data

**Review**
- Visualisation:
  - Walk through
  - Images
  - Manikin
  - Simulation

---

**AVEVA Marine**

www.aveva.com
**AVEVA Marine Key Features**

- Most productive hull and outfitting applications for clash free, production friendly design
- Integrated Schematic model and 3D model
- Automatic accurate production information for parts manufacture
- Integrated hull and outfitting assembly production information
- Distributed concurrent design - Global project execution
- Web-based collaboration
- Open lifecycle management solutions
PLM system in shipbuilding: Designed to Streamline Business Processes

---

3. AVEVA의 조선용 PLM

---

- Design Departments
  - Initial Design
  - Basic Design
  - Detail Design

- Partners
  - Suppliers
  - Contractors
  - Manuals
  - Drawings
  - Datasheets
  - etc

- Production Departments
  - Purchasing
  - Materials Mgt
  - Production Mgt
  - Requisitions
  - Purchase orders
  - Work orders
  - Production schedules
  - Resource plans
  - Payments
  - etc

---

AVEVA's 500,000+ Documents and Drawings
Typically 2,000,000+ physical parts
Multiple revisions
Not All PLM Solutions are the Same

- Capital Equipment
- Automotive
- Consumer Goods
- Shipbuilding
- Aerospace

Product complexity

Low
High
Not All PLM Solutions are the Same

AVEVA

AVEVA NET

AVEVA MARINE

Generic PLM Suppliers

Project

Production Process

Product

Low

Product complexity

High

3. AVEVA의 조선용 PLM
### AVEVA the Specialist PLM Supplier

<table>
<thead>
<tr>
<th>No of parts</th>
<th>2.5m to 40m</th>
<th>150k to 1.5m</th>
<th>20k to 30k</th>
</tr>
</thead>
<tbody>
<tr>
<td>Product Nature</td>
<td>Multiple (&gt;20), simultaneous, <em>unique</em> products</td>
<td>Multiple (&gt;10), simultaneous, <em>variant</em> products</td>
<td>Few (&lt;10) simultaneous, <em>fixed</em> products</td>
</tr>
<tr>
<td>Development Process</td>
<td>Concurrent design, construction</td>
<td>Design, prototype manufacture</td>
<td>Design, prototype manufacture</td>
</tr>
<tr>
<td>Design Collaboration</td>
<td>1000’s</td>
<td>1000’s</td>
<td>100’s</td>
</tr>
<tr>
<td>Management Focus</td>
<td>Change Control, Work Management</td>
<td>Design safety, Production efficiency</td>
<td>Production efficiency</td>
</tr>
<tr>
<td>Management Technique</td>
<td>Integrated design &amp; construction project management</td>
<td>Project management (design), Production management (manuf)</td>
<td>Production management</td>
</tr>
<tr>
<td>Lifecycle</td>
<td>Lifecycle of product</td>
<td>Lifecycle of product</td>
<td>Lifecycle of design</td>
</tr>
</tbody>
</table>
3. AVEVA의 조선용 PLM

Lifecycle Process & Solution

AVEVA MARINE Design Solution (AVEVA Marine, Tribon M3)
3. AVEVA의 조선용 PLM

- AVEVA의 조선해양 PLM 솔루션
- 설계와 생산의 가교

Connecting systems, people, and processes ... through information...
3. AVEVA의 조선용 PLM

AVEVA NET Solution Structure

AVEVA NET APPLICATIONS
- AVEVA NET Documents
- AVEVA NET Project
- AVEVA NET Engineering
- AVEVA NET Materials
- AVEVA NET Assembly
- AVEVA NET Commissioning
- AVEVA NET Exchange
- AVEVA NET Quality
- AVEVA NET Integration
- Custom Specific Etc.

AVEVA NET DASHBOARD
- AVEVA NET GATEWAYS

AVEVA NET WORKHUB
- Content Manager
- Data Models Documents
- Visualization
- Collaboration
- Workflow Manager
- Change Manager
- Security Manager
- Configuration Manager

www.aveva.com
AVEVA NET Architecture

- Rich Client (.NET Remoting)
- Web Client
- Service Bus API
- Shared Content Services
- Content Servers
- AVEVA Marine
- Integration Servers

Rendition Server
Mail Server
SQL Server
Integration Server
Other Systems

www.aveva.com
Open lifecycle management solutions that enables:

- Information networks in a project (people, tasks, plans, drawings, models, documents and materials) to be linked together to provide a single structured view of all the engineering information in context.
- Information can be shared, exploited and managed, in a collaborative way, within and across enterprises.
전통적인 설계와 생산의 Application들은 맞춤형 개발이나 대부분 문서들로 연결을 단절시켜 놓았습니다.
3. AVEVA의 조선용 PLM

AVEVA NET은 설계 Application과 생산 Application 간의 가교로서 디지털 데이터와 문서를 완벽히 연계하여 제공합니다.
3. AVEVA의 조선용 PLM

- 자원
  - 인력
  - 조직
  - 역할
  - 책임
  - 보유기술

- 보안
  - 접근
  - 승인
  - 당당
  - 등급

- 활동
  - 프로젝트
  - 작업지시
  - 업무타스크
  - 변경지시

- 자원
  - 인력
  - 조직
  - 역할
  - 책임

- 보안
  - 접근
  - 승인
  - 당당
  - 등급

- 활동
  - 프로젝트
  - 작업지시
  - 업무타스크
  - 변경지시

- 문서/모델/도면/데이터
  - 식별
  - 분류
  - 제어
  - 설명
  - 파일 콘텐츠와 복사

- 태그 아이템 (Tag Items)
  - 식별
  - 분류
  - 제어
  - 설명
  - 상관성
  - Proposed/Fitted 아이템

- 물리적 아이템 (Physical Items)
  - 식별
  - 분류
  - 제어
  - 설명

- 가상 아이템 (Virtual Items)
  - 식별
  - 분류
  - 제어
  - 설명
  - 세분화 기능

- 태그 아이템 (Tag Items)
  - 식별
  - 분류
  - 제어
  - 설명
  - 상관성
  - Proposed/Fitted 아이템

- 물리적 아이템 (Physical Items)
  - 식별
  - 분류
  - 제어
  - 설명

- 가상 아이템 (Virtual Items)
  - 식별
  - 분류
  - 제어
  - 설명
  - 세분화 기능
OBJECT CENTRIC(Object Centric)은 우리가 원하는 것에 대한 정보를 담은 것

개개의 객체는 구조화된 데이터로 구성되고, AVEVA NET 시스템 내에서 관리할 수 있다.

 객체는 표준 데이터베이스 쿼리 기능을 사용하여 검색할 수 있다.

 개체들은 버전처리, 액세스 제어 및 워크플로우로 관리할 수 있다.

 개체들 간의 서로 다른 부분을 비교 확인 할 수 있다.

 개체들은 어떤 상황에서도 요구하는 다른 개체들과 연결할 수 있다.
3. AVEVA의 조선용 PLM

- AVEVA NET object types (examples)
  - Physical Item
  - Virtual Item
  - Document Item
  - Person
  - Role
  - Organisation
  - System (application)
  - Project
  - Task
  - Responsibility
  - Others...
  - Change Request
  - Work Order
  - Change Order
  - Others...

- Person/organisation related object types
- Activity related object types
- Item related object types

- Object
- Association
- Object
Solution Strategy

- Search, Navigate, Access
- Collaborate & Status
- Consolidate & Compare
- Workflow Control
- Data Centric Integration

Level of Business Transformation

- HIGH
- LOW

Potential Benefits

- LOW
- HIGH

Information Integrity Solutions

Content Management Solutions

Portal Solutions

AVEVA의 조선용 PLM

www.aveva.com
AVEVA NET Portal (VNET)

AVEVA NET Dashboard

AVEVA NET Workhub
Object Management, Collaboration & Validation tools

AVEVA NET Gateways

XML Gateway
Engineering Applications
- e.g. AVEVA VPE
- InTools, Excel
- In-house

XML Gateway
2D Schematic Applications
- e.g. AVEVA P&ID
- PDS 2D
- SmartPlant P&ID

XML Gateway
3D Design Applications
- e.g. AVEVA PDMS
- PDS3D, SmartPlant3D

XML Gateway
Commissioning Maintenance, Asset Management
- e.g. SAP, PHAsset
- WINPCS, Maximo

3. AVEVA의 조선용 PLM
Project Execution Benefits

Schedule protection
Project visibility that crosses document, discipline, geographic and company barriers

Global working
Collaborate to leverage economies without compromising knowledge management & quality

Decision support
Instant and intuitive access to all project information through a single portal

Rapid deployment
Highly configurable, standards based solution without lengthy & expensive development and implementation

www.aveva.com
Project Execution Benefits

Managed inconsistency
Integration of information allowing early detection of inconsistency right down the attribute level

Inter-discipline co-ordination
Unite teams and information sources through a single intuitive repository of all project information

Change Analysis
Measure the impact of change through object associations, data, documents, people etc.

Handover
Managed and controlled handover mechanism with ability to audit data deliverable completeness
Project Execution Benefits

Information & knowledge re-use
Consolidated repository linked at object level allowing rapid retrieval of all information relating to a tag, part, asset etc.

Compressed search times
Rapid retrieval of project information increasing the time available for productive engineering tasks

Process Visualisation
e.g. Integration between engineering and project planning data to simulate sequencing

Reporting
Ability to create custom pages to report on KPIs such as logistics, completeness, installed etc.

4. AVEVA의 업종장점
Project Execution Benefits

Skills management
Application neutral information to users through a highly intuitive web-based portal – no specialist skills required

Standardising
Application neutral to protect the enterprises infrastructure investment and let business decisions drive choice and not technology limitations

Competitive Advantage – Handover
Managed handover and early visibility of clients data to enable accelerated commissioning and training

Competitive Advantage – Though life
Protect the service and maintenance contract by carrying forward the portal into operations

4. AVEVA의 업종장점
The AVEVA technology originally developed for Outfitting is being deployed more widely in authoring applications.

Combined with **Microsoft technology** to provide the best possible user interaction, configurability and information exchange.

AVEVA NET utilises Microsoft’s document management, integration and workflow technologies with **ISO15926 standard data modelling**

Vision evolving towards a single platform for project and lifecycle information management.
Welcome to AVEVA

AVEVA is the world's leading engineering IT software provider to the plant, power and marine industries.

Working in demanding industries with customers who depend on AVEVA's integrated engineering software from initial design and specification, through 3D engineering layout to procurement, materials management and project control.

Future product developments will extend the use of valuable design and engineering data more widely across the enterprise through the use of the AVEVA NET products.