

Data exchange in shipbuilding using XML

... data exchange between a cooling water configurator and a web-based equipment catalogue ...

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Procesmodel

XML

Elektronische
data uitwisseling

Productmodel

Productconfiguratie

STEP

Open Mind ... (2001 >)

info + process integration

integrated

model based

digital

knowledge / data re-use

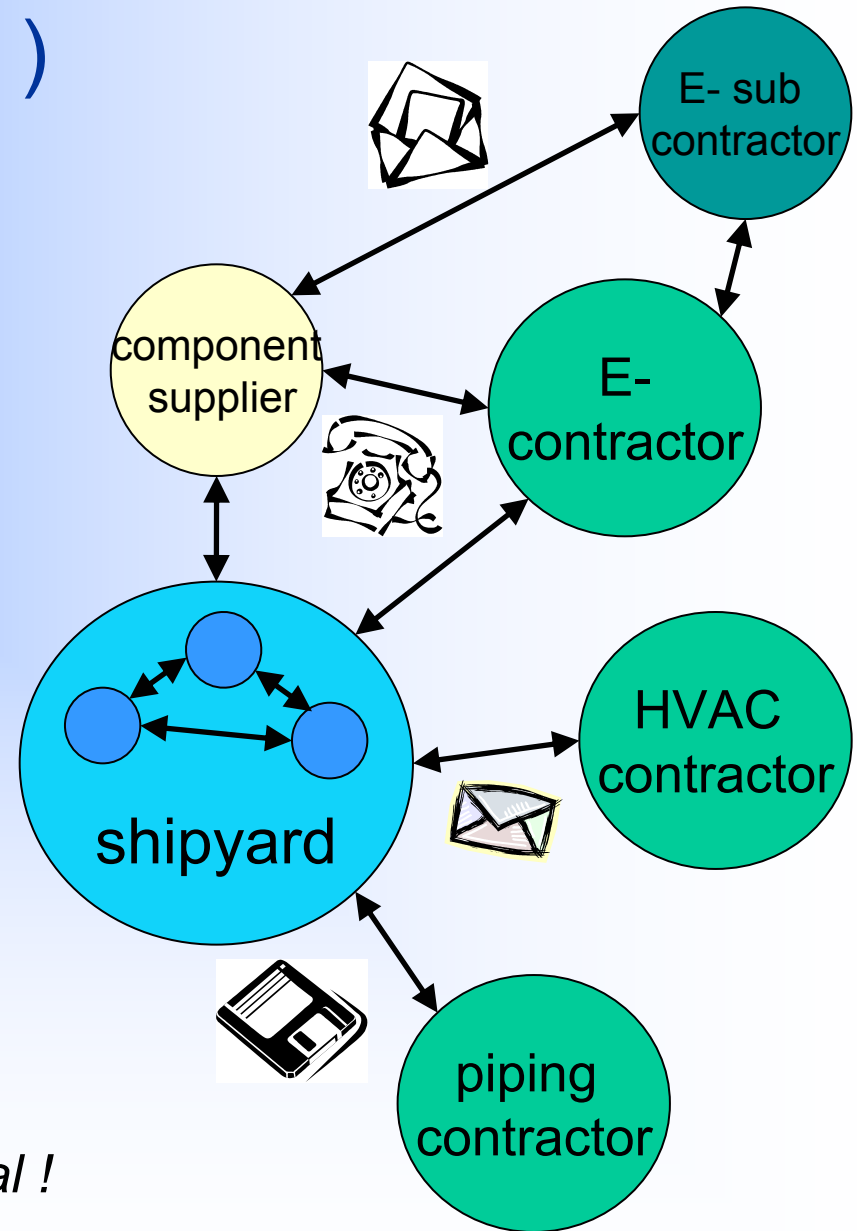
chain spanning



producing ships

efficiency / faster / better

competitive advantage: survival !



Open Mind ... (2001 >)

- pilots

- cooling water system configurator

Quaestor - IHC

- cost estimation / parametric design tool

Delft Poseidon - TUD

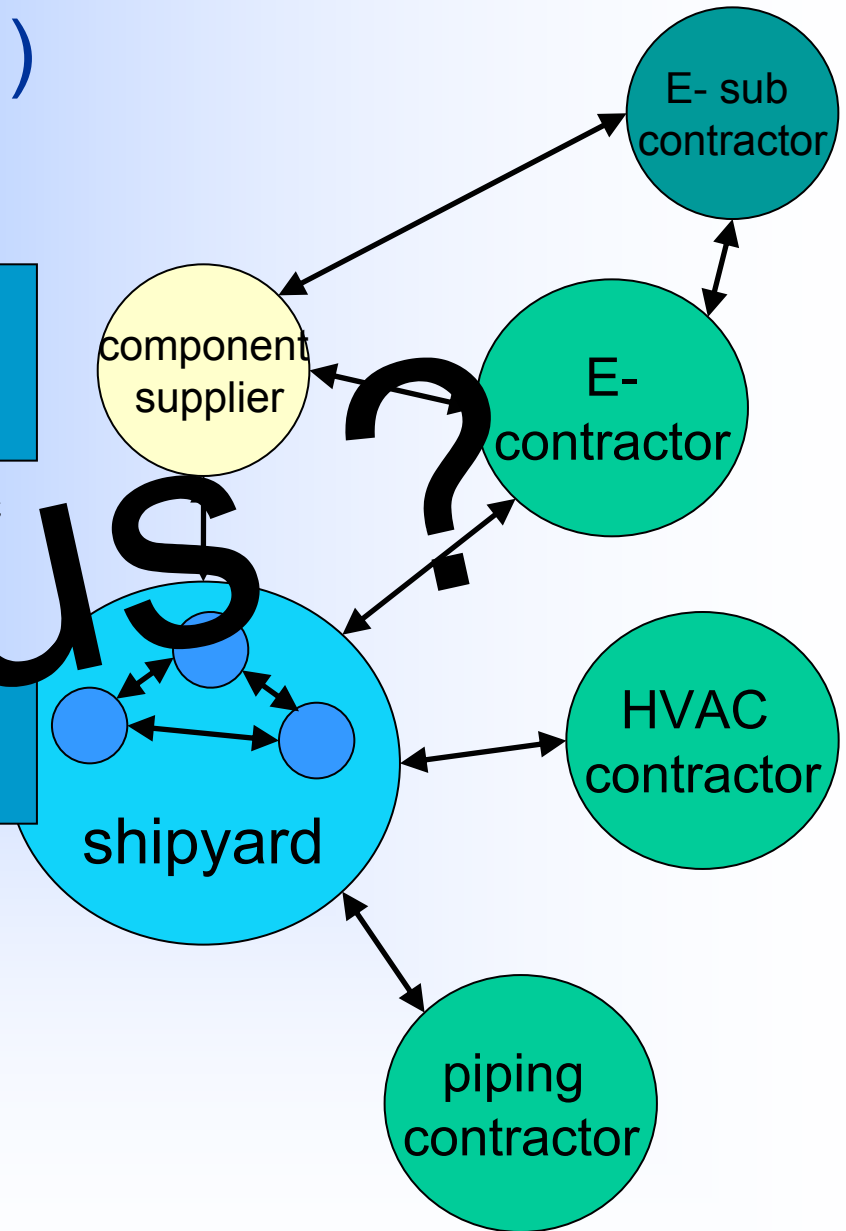
- marine equipment portal

Sea Equipment

- deliverables (a.o.)

- common product view & model for data exchange

- common dictionary



Design process

- Different calculation tools
 - Principal choices are made in pre-contracting phase
 - Interaction
 - Component data from suppliers
 - Preliminary estimations
 - Modifications
- ⇒ "The right preliminary estimation results in a smooth engineering process"

Objectives

Product configuration tool

- Design and calculate alternatives faster
- Reuse of knowledge and experience

Project

- Method for building product configuration tools
- Benefits and bottlenecks of product configuration tools

Approach

1. Collect existing knowledge
2. Build models:
 - Productmodel
 - Processmodel
3. Define software specifications
4. Select software platform
5. Build product configuration tool
 - Demonstrator
 - Prototype
6. Test product configuration tool

Product Configuration Demo

Frame Viewer [min] [max] [close]

Reference Data

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Text of: Dataset

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Slots & Properties [min] [max] [close]

Alphabetic Categorized

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Knowledge Browser Access to: Newqkb as Knowledge Engineer [min] [max] [close]

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← List →

- + Quaestor
- + Newqkb

[Q]nowledge
MODELING TECHNOLOGIES www.qknowledge.nl

Quaestor for Microsoft® Windows®

- Microsoft® Windows® 95
- Microsoft® Windows® 98
- Microsoft® Windows® NT 4
- Microsoft® Windows® 2000
- Microsoft® Windows® XP

[Q]uaestor

Version 2.33.1.22/11/2005 15:57:22
© Qknowledge BV 1990-2005
ID: 8AF0-4181-4BC9-6233-72D0-AF41-44C3
User Level: Knowledge Engineer
Valid until: 2005/12/31

[min] [max] [close]

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Benefits

- Maintainable
- Calculate more alternatives
- Reduce possible errors

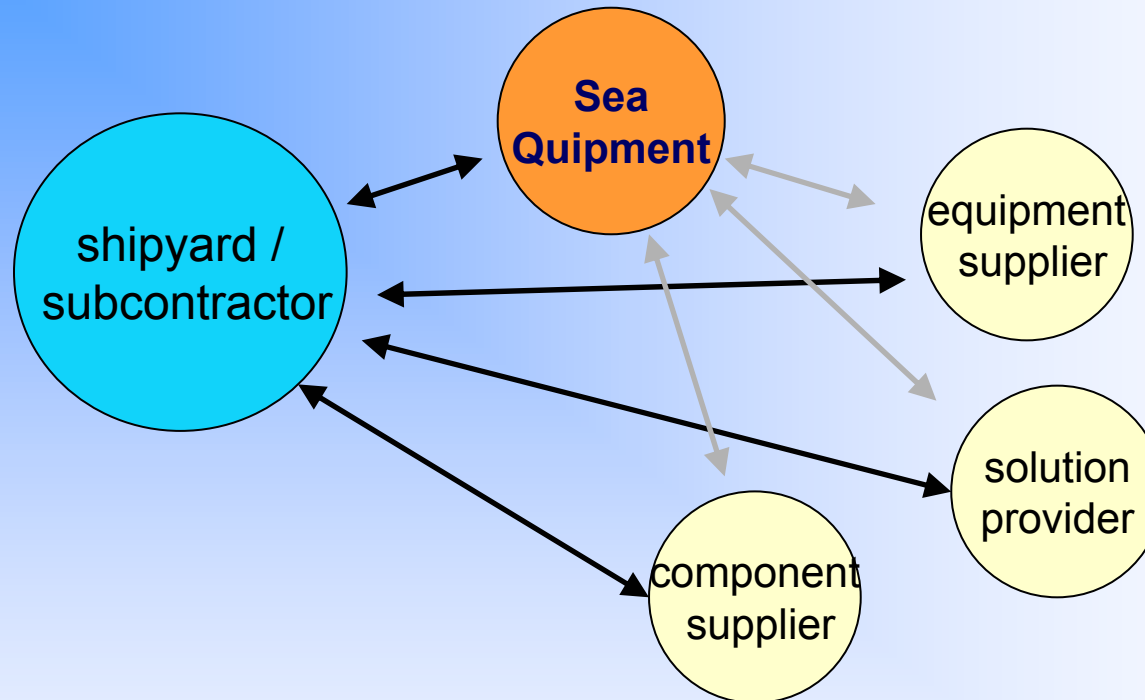
Bottlenecks

- Implementation in engineering proces
- Developing product configuration tools takes a lot of effort
 - Making knowledge explicit is time-consuming
 - Developing software platform and link with CAD

Further developments

- Prepare tool to be used in pre-contracting process
- Develop link with Nupas/Cadmatic - Quaestor
- Develop link with pipe routing system
- Develop more product configuration tools for more complicated systems

SeaQuipment Concept



- suppliers' yellow pages
- marine equipment / component catalogue
- facilitating platform Request-For-Data (RFD) messaging
- just info brokerage, NO transactions

SeaQuipment UI

The screenshot shows the SeaQuipment website interface. At the top left, the date "17-12-2005" is displayed. The main header features the "SEAQUIPMENT.COM" logo in a stylized font. Below the logo is a navigation bar with links for "home", "sign on", "log in", and "servicedesk".

On the left side, there is a vertical menu with links: "Become a member", "Free benefits", "Why present products on SeaQuipment?", "View the RFD's", "Contact us", and "E-mail this page".

The main content area is titled "Suppliers from all over the world with a complete range of marine equipment". It includes a search bar with a "Search" button. Below this, there is a grid of category links, each with a sub-link: "hull/outfitting" (hull, superstructure, etc.), "propulsion" (engine, propeller, etc.), "mechanical" (fire fighting, HVAC, etc.), "electrical" (cabling, lighting, etc.), "cargo/deck" (anchoring, lifesaving, etc.), "accommodation" (finishing, sanitary, etc.), "navigation" (positioning, sonar, etc.), "communication" (Satcom A/B/C/M, SSAS, etc.), "special systems" (dredging, sailing, etc.), "services" (design, trials & testing, etc.), and "tools" (for shipyards & on board).

Below the categories, there are three sections: "Brands A-Z", "Companies A-Z", and "Products & Services A-Z". A horizontal line of letters "A B C D E F G H I J K L M N O P Q R S T U V W X Y Z" is displayed below these sections.

At the bottom of the main content area, there is a section for "More information about SeaQuipment:" with a link to "Download the SeaQuipment media-kit". To the right of this is a "Company ID:" field with a text input box and a "Go to" button.

The footer of the page contains the text "Connecting the maritime industry!" and the contact information: "SeaQuipment BV Westerlaan 1 3016 CK Rotterdam The Netherlands T: +31 (0)10 4360112 - © 2000 - 2005 SeaQuipment BV".

SeaQuipment Specials

'intelligent' equipment / component description

- precise component classification
- supplier info
- URL's for picture, 2D/3D drawing, documentation
- structured technical property data
 - e.g. mass, dimensions, E-power characteristics
 - search support

usage char

- 380 com
- 1400 sup
- each mo
- 70 % Eu



class: cooling water pump

type: Desmi NSL 150-330/A16

mass: 604 kg

height: 1655 mm

power consumption: 27.39 kW

ews

DelftBase2



Delftbase 2.0 Network-edition Selected project :TR272 selected version :def

units Filter RollBack Commit Updates Excel SEAQUIPMENT Clear P Filter

Weight PB3 PB4 PB5

	Yg (m)	Zg (m)	WeightType (-)	MomX (-)	MomY (-)	MomZ (-)	PB3_NoU (m)	PB3 (kW)	PB3 (-)	PB3_PwrCons (-)	PB4_NoUs (-)	PB4_PwrCo (kW)	PB4_LoadF (-)	PB4_PwrCons (-)	PB5_NoUsed (-)	PB5_PwrCo (kW)
TestTrawler							888									
TR265																
TR272	0.1574	6.6531		40544	5064.765	8613.42				461.518				3564.885		
Group 0				0	0	0				0						
Group 1				11626.7	1440.896	1934.53				0						
Group 2				0	0	0				0						
Group 3				0	0	70500				194.76				194.76		
Group 4				0	0	0				57.578						
Group 5				0	0	0				26.75				26.75		
Group 6				9671.65	3214.675	8778.73				101.07				102.87		
Group 7				57313.2	5125.856	9239.16				26.1				72.72		
Group 8				0	0	0				55.26				37.44		
Group 9				61933	50964.4	16161				0				3130.345		
TRANSPORT_FISHING				0	0	0				0				533.385		
RSW-SYSTEM				21440	34682	24720				0				496		
RSW-P				14675	15840	8250				0				224.96		
RSW-compressor				114675	15840	8250					1	300	0.5733	172	2	600
Lub oil pump compressor											1	3.6	0.8333	3	2	7.2
RSW-condensorpump											1	42	0.8095	34	2	84
RSW-chilled water supply pump											1	12	0.75	9	2	24
RSW-chilled water supply standby																
RSW-chilled water pump											1	8	0.87	6.96	2	16
SLURRY-ICE PLANT				13050	23100	8050				0				116		
FREEZING INSTALLATION 1				13652	30330.4	22348				0				892.8		
FREEZING INSTALLATION 2				13652	52448	22348				0				595.2		
Realised																
User																
Calculated											1	12	0.75	9	2	24
Statistics																

Start Project1 - Borland ... Project1 8:01 PM

Open Mind pilot systems

- pilots

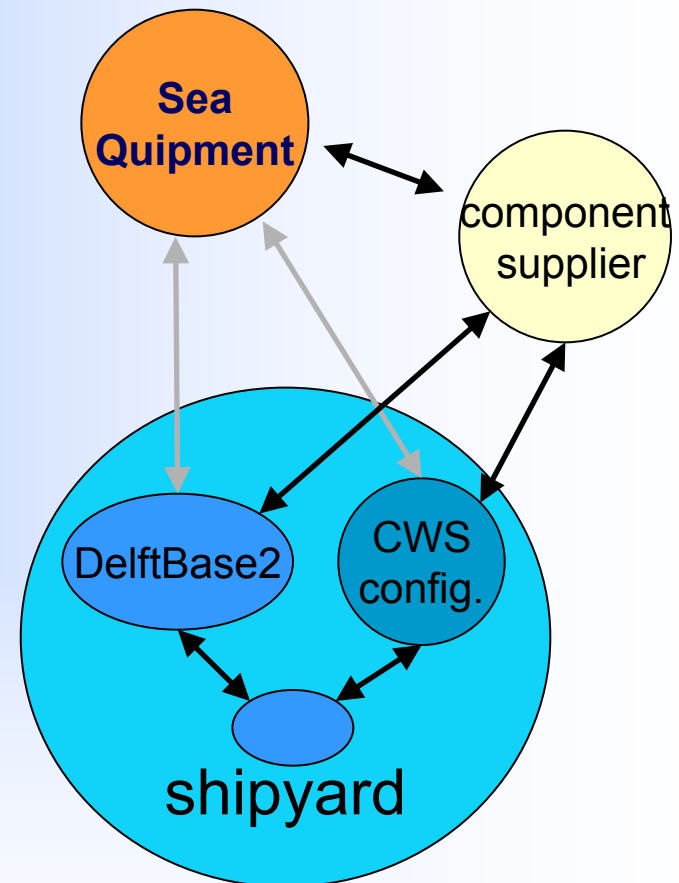
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Quaestor - IHC

- cost estimation / parametric design tool
DelftBase2 - TUD

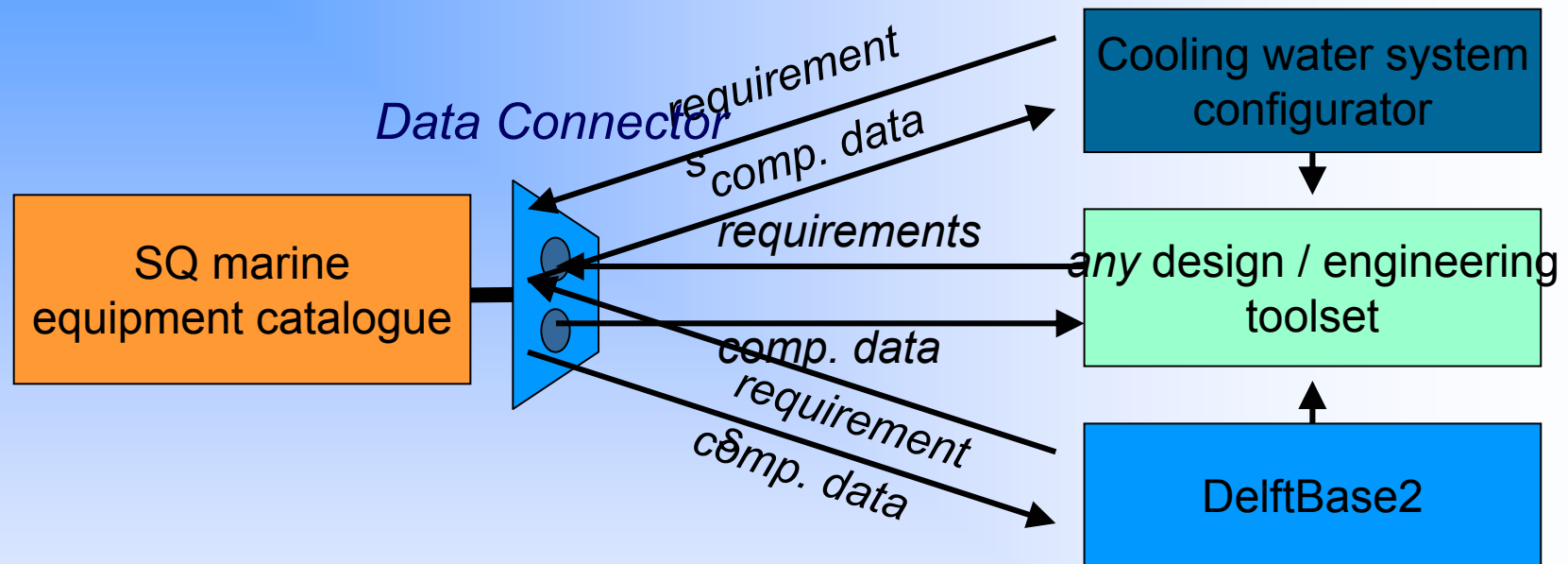
- marine equipment portal
SeaQuipment

- generic deliverables available

- common product view & model for e-data exchange
- common dictionary



SeaQuipment Data Exchange



automated interface advantage

- fast / convenient
- avoid copying errors
- early availability data

features

- simple, open SQ SOAP interface
- VNSI/OM XML file format
- VNSI/OM dictionary

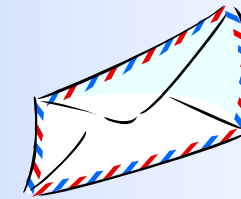
SQ Data Connector Usage Diagram

1. specification



2. reqs. posting

class: rotating pump set
head: 2.4 – 3 bar
flow: 304 – 337 m3/h



SOAP / XML

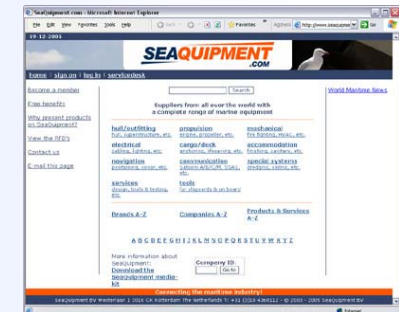
SQ server



3. SQ refine + select

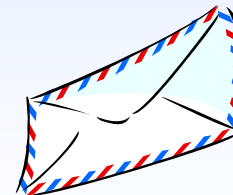
*interactive /
browsing*

SOAP / XML



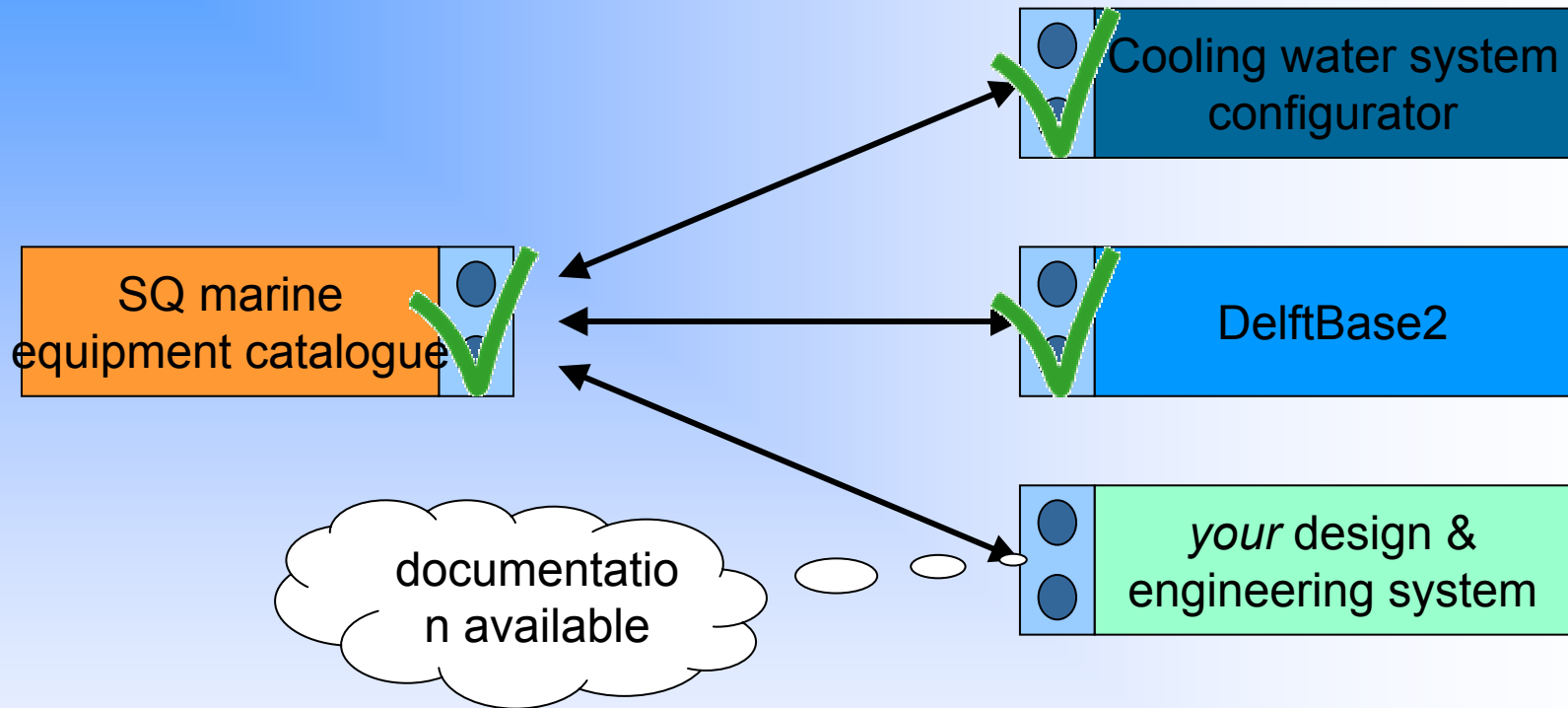
4. data retrieval

5. engineering



SQ return envelope
VNSI/OM XML file
<pump description>

SeaQuipment Data Exchange



implementation experience

- VNSI/OM file format updated
- 'proof-of-concept' partial demo dictionary

practical usability conditions

- substantial 'rich' equipment data available
- VNSI/OM dictionary completion

SQ Data Connector Demo

Work to be done

Near Term:

SeaQuipment Data Connector

- encourage / support suppliers to add 'rich' data (SQ)
- extend partial 'demo dictionary' to full dictionary
using proven principles (VNSI)

Shipbuilding Industry

- put SQ Data Connector to work
- gather useful experience (pro's / con's)
- explore further goals for data exchange

Work to be done - Horizon

Now

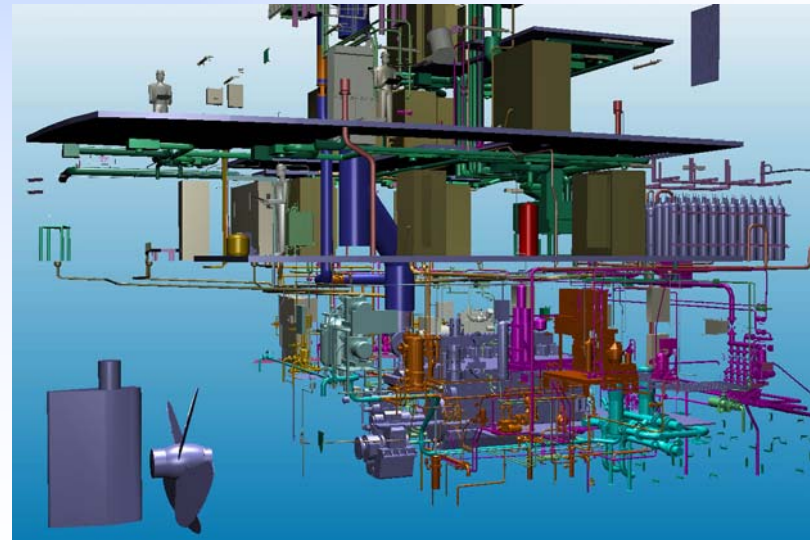
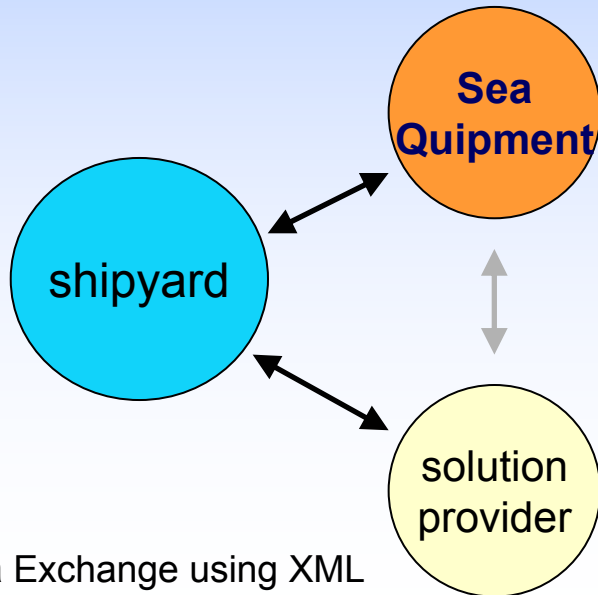
- single component download

E -
← *exchange* →



Future

- system configuration exchange
- ship configuration exchange



Data Exchange using XML

Work to be done - Horizon

we've only just started

