Revolutionizing Technical Fleet Management in the Maritime Industry

White paper

How to improve efficiency and reduce costs by introducing Software as a Service (SaaS)

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Revolutionizing Technical Fleet Management

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Revolutionizing Technical Fleet Management

How to improve efficiency and reduce costs in the maritime industry by introducing a Software as a Service (SaaS) delivery model

Shipping companies running traditional technical fleet management software are often sobered by the high investments and operational costs of running and maintaining the software. In addition, they are disillusioned by the limited additional benefits the software offers, for instance in terms of reporting functionalities.

Although many shipping companies are thinking about employing a professional technical fleet management software, they often hesitate to introduce such a third party system. There are several reasons for this: companies are wary of time and costs involved in evaluating different products and implementing the system, as well as training the users. In addition, implementing a traditional software system also means shipping companies have to invest heavily in hardware, IT personnel, security, and support, on an ongoing basis.

Yet, in times where affordable bandwidth and increasingly powerful processors are simplifying how we do business, many companies are revisiting the choices they made with regards to the type of software they use, and how they run it.

Software as a Service (SaaS) is one of the most important recent innovations in terms of deploying and using software, and it has eliminated many of the negative aspects associated with running software systems. As a consequence, the Software as a Service (SaaS) concept is becoming more and more widespread.

This white paper discusses two things:

- it explains the pros and cons of SaaS, and
- it takes a snapshot at how the Maritime Industry can employ SaaS to improve its technical fleet management operations.

SaaS is the new reality

Not long ago, SaaS was almost exclusively limited to CRM (Customer Relationship Management) applications such as Salesforce. Today, typical SaaS applications include accounting, E-commerce, ERP (Enterprise Resource Planning), database applications, project management, and many other applications. Previously, such applications were expensive on-premise products that only large companies could afford.

Today, with SaaS, even small companies can access state-of-the-art applications for a reasonable fixed subscription fee. The web-based model allows businesses to maintain a single system, and to make use of applications operated by service providers rather than themselves. That relieves them of the need to buy, operate and maintain IT infrastructure and application software.
What is SaaS?

The concept of Software as a Service (SaaS) has been in use for a number of years. The acronym SaaS first appeared in an article published in 2001. Its concept is based on the idea to provide, support and run software via the internet. Simply put, SaaS means delivering software over the Internet.

SaaS has become increasingly popular for its ability to simplify deployment. It also permits software providers to support many customers with a single version of a software. It is far more cost-efficient to develop and support one version of a software centrally – and to offer the application as a web-based service – than to maintain a variety of software versions locally and on a number servers.

Not only does the SaaS concept allow for more efficient resource utilization, it also eliminates the high costs of proprietary hardware and applications, and the IT resources to maintain and operate the infrastructure.

SaaS: IT trend with potential

With SaaS, a software provider licenses an application to customers as a “service on demand”. This approach to application delivery is part of the utility computing model where all of the technology is in the “cloud” – accessed over the Internet as a service. This is in contrast to the traditional approach where every application is licensed, installed, maintained and supported on every device or computer.

Today, many companies in a variety of industries have adopted SaaS applications. The main aim is to optimize reliability and costs by offloading the burden of hardware maintenance (i.e. server, network) and software maintenance, as well as data backup.

In a 2010 study of “Computerworld”, almost 50% of the respondents mention “Cloud” and “SaaS” as belonging to the most important IT issues over the next two years.

In the next two years, what do you see as some of the main forces driving your areas?

![Cloud computing is a new way of delivering computing resources, not a new technology.](image)

Source: “Computerworld” August 2010, Top 500 ICT companies in Switzerland. Multiple answers were possible.

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1 Article called "Strategic Backgrounder: Software as a Service"; published in Feb. 2001 by the Software & Information Industry’s (SIIA) eBusiness Division.

SaaS versus traditional on-premise systems

While there are different SaaS models available in the market, a few key characteristics are common to all SaaS models:

<table>
<thead>
<tr>
<th>On-premise Software</th>
<th>SaaS delivery model</th>
</tr>
</thead>
<tbody>
<tr>
<td>▪ The software is purchased upfront and integrated into the IT landscape of the company</td>
<td>▪ SaaS suppliers provide customers access to the software via the internet</td>
</tr>
<tr>
<td>▪ The software is owned by the customer</td>
<td>▪ Software is not owned by the customer; it’s owned by the SaaS provider</td>
</tr>
<tr>
<td>▪ The software is deployed, managed and supported as well as maintained by dedicated inhouse IT personnel</td>
<td>▪ The services noted on the left are offered by the SaaS provider as part of the subscription fee.</td>
</tr>
<tr>
<td>▪ The customer provides the in-house infrastructure to support the software, such as servers, hardware, networks and security measures.</td>
<td>▪ The SaaS provider is responsible for maintenance, upgrades, support and security of the software and infrastructure.</td>
</tr>
<tr>
<td>▪ It’s the customer’s decision whether or not to utilize the latest version of the software. If so, additional costs are incurred.</td>
<td>▪ The software provider makes available the latest version of the software to all its customers, at no additional costs.</td>
</tr>
</tbody>
</table>

Total costs of ownership (TCO) comparison

When comparing the costs of an on-premise solution with a SaaS solution, one has to be aware of the different cash outflows incurred by inhouse data centers and server infrastructure:

▪ The direct costs that go with running a server: server, power, floor space, storage, backups, various licenses, and IT operations to manage these resources.

▪ The indirect costs of running a server: network and storage infrastructure, IT operations to manage the general infrastructure and data security.

▪ The overhead costs of owning a server: procurement of server infrastructure, administration and accounting personnel, IT management, depreciation.

Once the infrastructure is put in place, the above costs are incurred regardless of whether the software application is being used or not. This could be compared to buying versus renting a car.

Even if the car owner doesn’t like his car anymore, the full purchase price is due for payment, and the ongoing costs such as insurance, maintenance, new tires and so on are incurred. When the car has reached the end of its useful life, one has to buy another car. By contrast, if a car is rented, the driver is committed to it only as long as he wants to use it. Once the driver paid for that use, there are no further financial obligations. It’s the rental car company’s obligation to pay for insurance and other disbursements to keep it in excellent shape. And it’s in the rental car business’s best interest to keep its cars in good shape, or else the company won’t stay in business for long.

Similarly to the above analogy, SaaS presents a low-cost, flexible alternative to the do-it-your-own-software approach. The software is neither installed nor operated on the company’s IT landscape, but is offered as a hosted service. Employees utilize the application via a web-based frontend, or open an offline software client which regularly synchronizes with the central database.
This is particularly important in the maritime industry, i.e. for ships that have no continuous internet connection. No server needs to be hosted at the client’s site, nor do clients have to worry about security, backups or installing software updates on users’ computers.

**SaaS presents a low-cost alternative**

<table>
<thead>
<tr>
<th>On-premise Software</th>
<th>SaaS delivery model</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Capex</strong></td>
<td><strong>Capex</strong></td>
</tr>
<tr>
<td>• Costs for hardware, networking equipment, infrastructure and security measures, plus costs for replacements and upgrades of hardware over time</td>
<td>• No capital expenditure incurred if the company already has sufficient internet access.</td>
</tr>
<tr>
<td>• Purchase and licensing price of software, plus recurring costs for software upgrades</td>
<td></td>
</tr>
<tr>
<td>• Additional costs for licenses and hardware when the business grows, i.e. when new users are added</td>
<td></td>
</tr>
<tr>
<td><strong>Opex</strong></td>
<td><strong>Opex</strong></td>
</tr>
<tr>
<td>• Integration and deployment</td>
<td>• Subscription fee (e.g. per user, per transaction, per month, per year, per company)</td>
</tr>
<tr>
<td>• Managing, supporting, maintaining the software, including deployment of new releases</td>
<td></td>
</tr>
<tr>
<td>• IT Personnel costs and overheads</td>
<td></td>
</tr>
<tr>
<td>• Purchase or renting of floor space for server room</td>
<td></td>
</tr>
</tbody>
</table>

Capex = Capital expenditure • Opex = operational expenditure

**How come SaaS providers can provide software at lower costs?**

Traditional applications require a dedicated set of resources to fulfill the needs of just one organization. This means, with traditional systems, each customer makes available his own server hardware and care for maintenance, upgrades, security, backups and so on. – In the maritime industry, sometimes a server is run for each individual vessel.

**The magic word: Economies of scale**

A SaaS platform, however, can satisfy the needs of multiple customers, using the hardware and personnel resources to manage just one single software instance. Customers access the software on the central server by using their existing computers. The data remains on the central server; no need for customers to worry about security, backups, implementing software upgrades and other IT related tasks. This yields tremendous economies of scale:

- Only one set of hardware resources (central server) is necessary to meet the needs of all users;
- A relatively small staff manage efficiently and securely only one stack of software and hardware;
- Developers build, support and further develop a single code base on just one platform, rather than on many.
The top 8 benefits of SaaS

1) Save Money

No up-front costs: No dedicated on-premise servers needed, and no other expensive infrastructure for their operation. In addition, there’s no tied-up capital for hardware or up-front costs for software licenses.

Reduced IT costs: Purchasing software the traditional way results in significant expenditures for installation, maintenance, managing updates and migration of the data. By contrast, system maintenance (backup, updates, patches, security, technical support, etc) is already included in the subscription fee of a SaaS solution.

Predictable, low pricing: The pay-as-you-go model incurs significantly lower costs in comparison with traditional systems, and it includes the costs for maintenance, support, and upgrades.

This means: Instead of investing in hardware and purchasing software licenses, clients pay only for what they actually need, e.g. based on the subscribed applications and number of users. Apart from the relatively low operations costs of running SaaS applications, clients benefit from the fact that future software upgrades are included in the fee. Positive side-effects: no capital is tied up; capital can be used for other projects; no need to provision for future computing resources.

2) Save Time

Speed of deployment: SaaS solutions are up and running within a very short time span. System implementation, ranging from evaluation to specification, data implementation and deployment and training, usually happens within weeks as opposed to months or years. This is because many of the issues related to the implementation of proprietary software do not apply, and because the software is already in full operation on the SaaS provider’s infrastructure. Additionally, training needs tend to be minimal as the software must be intuitive and easy-to-use in order to meet the requirements of its broad user-base.

3) Access software from anywhere

SaaS applications are accessible from anywhere with an internet connection. Users aboard ships work with an offline software client.

4) Concentrate on core business and increase productivity

Being relieved of many IT related issues means that companies can redirect human and financial resources to the company’s core business.

5) Benefit from flexible and rapidly scalable system

With SaaS, there are no hardware issues connected with an increase (or decrease) of the number of users. This means, the system quickly adapts to changing numbers of users. This offers a great deal of flexibility, particularly in the shipping industry, where fleet sizes may vary on a regular basis.

6) High reliability, performance and security

Software applications offered as SaaS are hosted in high-capacity, powerful and secure data centers. No provider can afford to upset its clientele with long reaction times, unavailable services or insecure system architecture. Redundant server farms ensure continued availability in peak times or in case of a server breakdown. Infrastructure operated by SaaS providers outclass customer-operated infrastructure simply because of their focus and size: they’re run by companies whose core business it is to run complex IT systems.
7) Always current and compatible software

SaaS applications are upgraded on the central server. This happens with little or no involvement by the customer. This ensures that all users of the system automatically work with the latest version, and time consuming updates or problems due to differing software versions are eliminated. With SaaS, there is centralized backup, recovery and archiving. Crews aboard vessels work with an offline version of the application. Regular synchronization ensures that both software and data are up-to-date.

8) Low entry and exit barrier

Due to the moderate initial costs and the subscription fee, SaaS has a very low entry barrier. This enables small to medium sized companies to employ professional software applications which previously were too costly and time-consuming to implement for them. Businesses reduce the risk to be tied down with proprietary, under-performing solutions.

What drives move to a SaaS model?

A survey done by Information Week Analytics in 2010 reaffirms several key benefits of SaaS adoption:

What Drove Your Move To A SaaS Model?

- Speed to implementation: 3.90
- Savings on capital expenditures: 3.50
- Savings on operational expenses: 3.40
- Better features compared with other "traditional solutions": 3.30
- The SaaS model matches our business model better: 3.10
- Inability to get IT resources to support and maintain on-premises apps: 3.00
- Inability to get IT resources to deploy on-premises apps: 2.90
- SaaS applications are easier to integrate with our other applications: 2.70

Source: Information Week Analytics 2010 SaaS Survey of 331 business technology professionals at organizations using SaaS

Source: Blog.softwareinsider.org/2010/01/
Key drivers for adoption of cloud computing

<table>
<thead>
<tr>
<th>Driver</th>
<th>Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>Value for money</td>
<td>• Reduced duplication and costs</td>
</tr>
<tr>
<td></td>
<td>• Leveraging economies of scale</td>
</tr>
<tr>
<td></td>
<td>• Increased savings through virtualization</td>
</tr>
<tr>
<td></td>
<td>• Allow for “measured” payment (pay as you use)</td>
</tr>
<tr>
<td></td>
<td>• Reduced energy use</td>
</tr>
<tr>
<td></td>
<td>• Ability to reinvest in, and concentrate on, core objectives</td>
</tr>
<tr>
<td></td>
<td>• Adopt, where fit for purpose, modern technologies and practices</td>
</tr>
<tr>
<td></td>
<td>that improve ICT effectiveness and efficiency</td>
</tr>
<tr>
<td>Flexibility</td>
<td>• Create a flexible services-oriented environment</td>
</tr>
<tr>
<td></td>
<td>• Rapid provisioning and deployment of services as well as on</td>
</tr>
<tr>
<td></td>
<td>demand scalability and elasticity for services &amp; capabilities</td>
</tr>
<tr>
<td>Operational reliability</td>
<td>• High resiliency and availability</td>
</tr>
<tr>
<td>and robustness</td>
<td>• Standard offering</td>
</tr>
</tbody>
</table>


Reservations about SaaS solutions

Despite the advantages of SaaS, some reservations exist. Issues such as security, data sovereignty and inflexibility in terms of customization of the software tend to be mentioned. When it comes to extremely sensitive data, particular attention must be paid to data security and legal issues. On the other hand, this applies to any software application, be they traditional or SaaS applications. In terms of data sovereignty, some people may worry about losing physical control over their data.

However, experience shows that security issues tend to be dealt with more professionally at a dedicated SaaS application provider than would be the case with in-house solutions. Cloud providers have a vital interest in safe IT environments: Security problems would soon mean the end of a SaaS company.

For SaaS applications to work efficiently, access to the Internet is essential. Yet, this is already a given in today’s business environment; Internet access is usually part of the standard infrastructure. For use aboard ships, the SaaS application is managed offline, and data transfers as well as software updates are conducted via regular synchronization.
Checklist whether or not to implement SaaS

This checklist may help you evaluate whether a SaaS application is appropriate for your company or your project. Any YES answer points you to the system more appropriate in relation to the question.

<table>
<thead>
<tr>
<th></th>
<th>SaaS</th>
<th>Traditional or inhouse</th>
</tr>
</thead>
<tbody>
<tr>
<td>High initial costs unacceptable?</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Costs are no deciding factor?</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Any time pressure for the implementation?</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Multiple locations involved?</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Requirements that cannot be met with standard solutions?</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Want to employ additional IT personnel?</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Application to be accessible from any location?</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Regular upgrades of the software to be managed?</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Low or large number of users involved?</td>
<td>Low / rather low</td>
<td>High / rather high</td>
</tr>
</tbody>
</table>

SaaS in the maritime industry

While there are many SaaS companies in the market, there’s only a small number of specialized SaaS software providers focusing on the maritime industry. In our view, there are two main reasons for this. This is firstly due to the conservative thinking in shipping. The industry is not known for taking up new technologies fast, they’re more comfortable in the role of followers than in the role of early adopters. Secondly, at the moment, not many SaaS providers for the maritime industry exist. Most established software solutions are built on software architecture that cannot be used to reliably and securely deliver software applications and data via the cloud.

Typically, a SaaS software provider is a relatively young company, whose solution is based on a multi-tenant architecture (a single version of the application is used for all customers, i.e. “tenants”). Prominent exponents of SaaS software can be found in Shipping Portals (e.g. CargoSmart), information sharing portals (e.g. ShipDecision) and technical fleet management (MESPAS). In terms of technical fleet management, there are two distinctive features the software must possess: high quality data management and easy-to-manage offline availability.

Data management

The SaaS provider manages – on behalf of all customers – the data and documents that are shared by all users of the application, for instance product specifications, OEM manuals and the like. Since this is done centrally and for all clients, the costs for this are very low for each client, i.e. definitely much lower than if each customer would have to do this on his own.

In terms of ownership of the data, customer-specific or vessel-specific data belongs to the customer and not to the system provider such as MESPAS. Accordingly, customers can access and download their data in any industry-standard format.
Offline availability
Office staff access the central database in real-time through a secure internet connection – no matter when and where they are located. Crews aboard the vessels work offline by accessing the database on board, which is mirrored to the central server’s database ashore. Regular synchronization as part of the standard sync schedule of each vessel ensures that both ship and shore work with the same up-to-date information.

Added benefit: Freeing up resources for other projects
Working with traditional procurement and fleet management applications involves many time-consuming and costly issues that aren’t part of the core competencies of a typical player in the shipping industry, mainly in the area of Information Technology (IT). Not so with SaaS. SaaS allows providing and maintaining applications centrally. All clients use the same technology and benefit from continual software improvements at no additional costs. The software is not installed on-site, but accessed via the internet, meaning the software solution is available anytime and anywhere.

Outlook
Cloud computing services and SaaS applications will play an increasingly important role in the shipping industry in the future. It is predicted that more and more businesses will outsource complexity (IT and hardware concepts) to external service providers and data centers. With SaaS, these companies will benefit from professional software applications without having to worry about all of the hardware resources. Regardless of whether financial considerations or outsourcing complexity are the drivers behind employing SaaS, the main priority remains unchanged: The application must be easy-to-use, safe and work flawlessly.

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