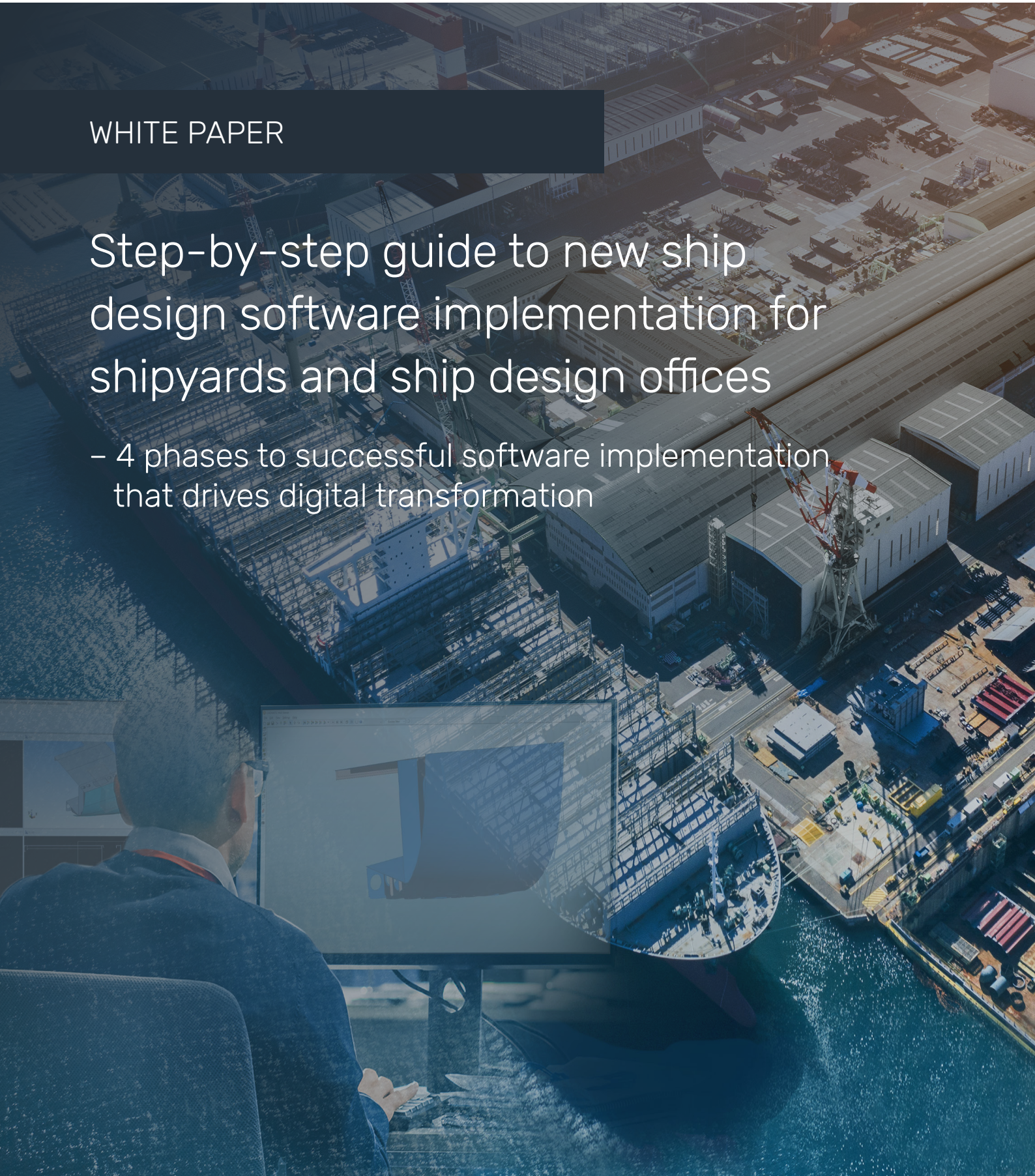
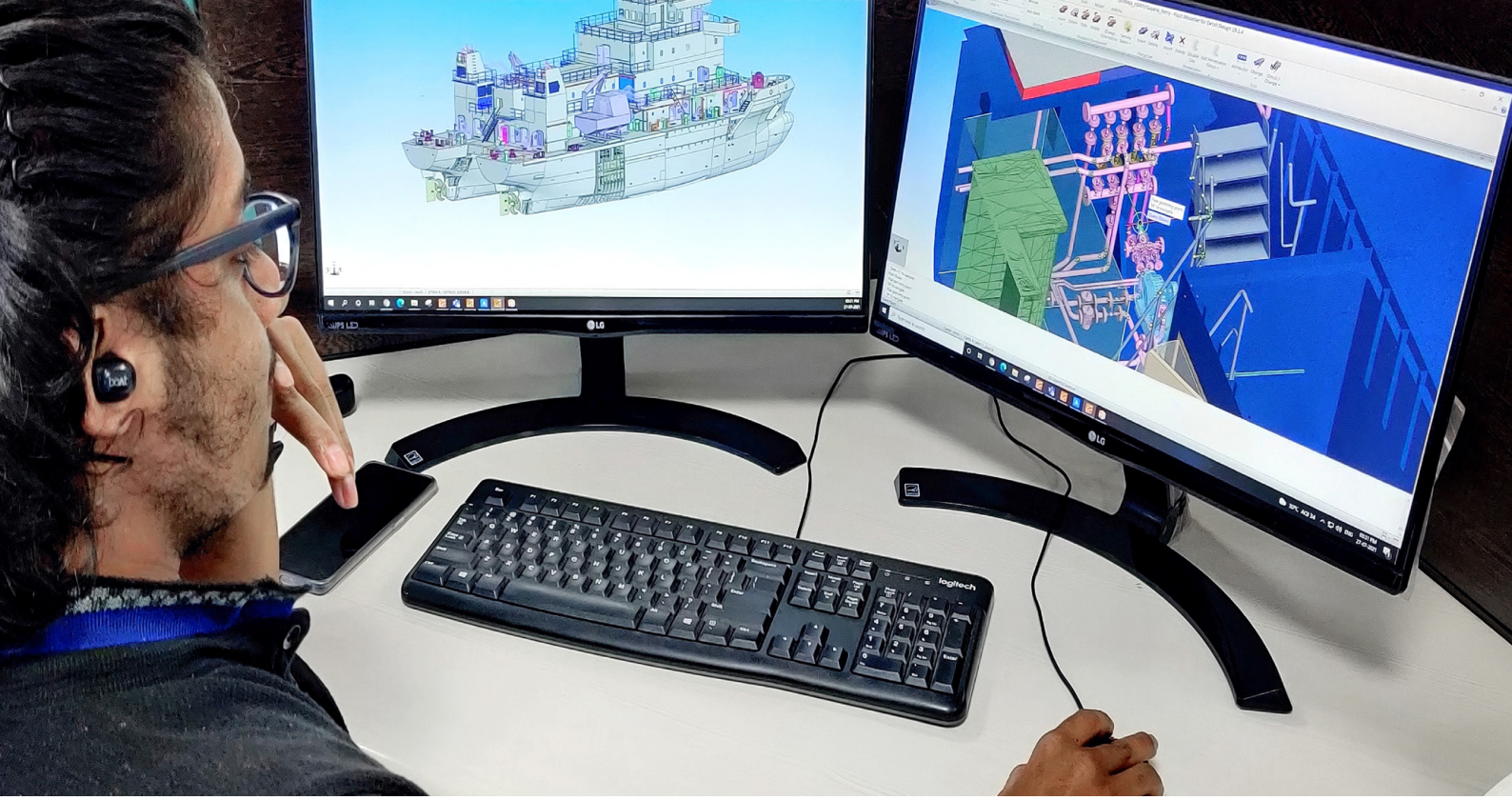
CADMATIC



WHITE PAPER

Step-by-step guide to new ship design software implementation for shipyards and ship design offices

– 4 phases to successful software implementation that drives digital transformation



Introduction

This white paper contains a guide to best practices and outlines the main phases of successful implementation of ship design software for shipyards taking on digital transformation and modernization path. It alleviates concerns regarding the implementation of new ship design software at design and engineering offices, and tackles the implications for shipbuilding management processes.

The decision to implement new CAD/CAM software at a shipyard or a ship design office leads to an implementation project, training, and technical support cooperation with the solution provider. Besides the direct implementation tasks, additional benefits can be gained from knowledge and experience sharing and tapping into a pool of existing software users.

Taking a new CAD software into use at a modern shipyard may seem daunting due to the far-reaching effects on many different parts of the shipbuilding process: Maintaining the status quo could be viewed as more comfortable. However, the accelerating pace of digitalization in shipbuilding and the use of the latest technologies provide the opportunity for vast efficiency gains. This can be achieved with modern ship design software and new computing technologies.

At CADMATIC, we understand how important it is for shipyards to have uninterrupted production, even when changes are implemented. The duration of training is but one of a wide range of issues that need to be considered in the implementation project. We have a proven track record of providing software solutions and ensuring smooth and fast implementation at the largest and most complex shipyards in the world.

CADMATIC expertise in ship design solutions and shipbuilding digitalization

CADMATIC Marine software solutions are currently used in over 40% of active shipyards in the world, 60 countries, and 850 user organizations, making it the top shipbuilding-dedicated software in the world.

Every year, we welcome about 40 new customer organizations and help them to benefit from top-level shipbuilding solutions.

CADMATIC did its first CAD software implementation for shipyards already in the late 1980s. Since then, the implementation method has evolved from face-to-face training at shipyard premises, to hybrid and online video courses in the CADMATIC Academy supported by implementation specialists and key account managers.

Our experience and project management guidance ensures that implementation runs smoothly, and all possible implications are addressed and resolved early. It focuses on important mile-stones and on providing help to users while keeping in mind project schedules and shipyard performance.

Contents

CADMATIC

Ship design solution implementation – 4 phases to success

The CAD software implementation process typically follows the OODA model – Observe-Orient-Decide-Act. This ensures that best-fit solutions are designed based on the unique situation and internal work processes of each shipyard and organization. The importance of each step in this approach should not be underesti-mated. Without proper analysis of the existing work processes currently employed at the shipyard, it is unwise to rush CAD implementation.

Any change offers new opportunities and threats si-multaneously, the same applies to CAD/CAM soft-ware implementation. While opportunities are typically well understood and explored at the bench-marking stage, threats surface later and should be dealt with carefully.

The process of implementation is of critical importance to overall success. It may seem that changing ship design software is a local design department issue and can be handled within the borders of one or two teams. The seamless implementation aims to ensure all other processes in the company or at the shipyard are mapped and considered while keeping time schedules reasonable and ensuring that goals are reached.

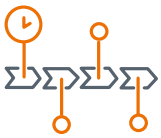
Most often, the solution provider takes care of the implementation process. It is the most natural choice as software use cases and functionality come di-rectly from the software development, and requests from users can be directed straight to R&D teams for customization and development. Experienced support engineers can effectively foresee and mitigate possible risks and guide the process. It requires deep knowl-edge of software functionality, best industry practices, project management skills, and soft skills to handle change management and manage expectations.

We have collected the best practices and most com-mon pitfalls from CADMATIC's customer service teams and customers. This guide addresses the most typical process in detail. It is good to keep in mind that one stage can be as little as a one-hour meeting in simple cases or as extensive as a detailed plan agreed with several shipyard departments and stakeholders.

The scale of the implementation project can range significantly. Each case is unique and should be tailored to the customer's needs and targets. It can entail simply taking one software module into use such as eBrowser, which would not require any specific training. Implementing a shell plate development module, for example, would only require a few days training in hy-brid mode to ensure all functionality is used and users can start producing project documentation. However, most cases include full-scale design implementation – when production timelines have to be respected, large groups of users trained in different shipbuilding disciplines, legacy data from other software handled, interfaces to machinery added, integrations to other systems ensured, and overall shipyard performance addressed.

A successful ship design solution implementation project is divided into 4 phases:

Phase 1: Collecting information about work processes and standards



Phase 2: Creation of implementation plan and establishment of main milestones in the timeline

Phase 3: Execution of training and implementation plan

Phase 4: Operational assistance: maintenance, support services, project assistance

Phase 1: Collecting information about work processes and standards

In the first phase of the project, all the relevant information required for successful project implementation is collected. Several meetings are organized with the shipyard's experts to identify the main scope of the implementation plan, the key persons involved, and to scan the current work processes. Depending on the scope of the project and specific needs, this phase can be focused on one particular aspect of CAD/CAM, or it can be an extensive evaluation of the complete digital landscape in the shipyard.

Typically, at least the following information is collected:

Shipyard's processes

A good starting point for the project is a discussion about general shipyard or design company operational processes and practices from early design to production and completion of vessels. Will the new CAD software strictly support existing processes, or are improvements expected? How many employees are involved in design work, the type of design work, and other activities that are undertaken.

CADMATIC experts are ready to share their knowledge about alternative methods based on extensive knowledge of global shipbuilding operations. If needed, neighboring disciplines, such as document and information management, and production planning can be included in the project scope.

Typical schedules for the release of documentation from different disciplines and how this process is linked with subcontractors, project planning, and production engineering reveal the prioritization of design work and production planning.

Output documentation

The documentation outputs that are required by the shipyard or customers play important role in setting up the CAD/CAM solution. What are the formats and schedules of the required documents? Examination of the provided document examples significantly helps to facilitate later stages of the project – examples of hull assemblies and arrangement drawings, blocks and panels, requirements for nesting information and shell plates, piping arrangement drawings, spools and foundations for outfitting, as well as BOM and other documents. Are these the shipyard's own requirements or customized for other production lines?

Business networks

What subcontractors, turnkey suppliers, and other partners are included in the wider shipyard network? Many shipyards have extensive and complex collaboration networks and thorough knowledge of all partners, their roles, and requirements are essential.

Production machinery & requirements

What production machinery is used by the shipyard and what are the digital output requirements for production: cutting and bending CNC machines, profile cutting and bending, automated welding robots, pipe bending machines, automated warehouse storage, and logistical systems of the shipyard. Embedding these requirements into the CAD software implementation plan from the beginning ensures the most efficient use of digitalization through all shipbuilding processes.

Project schedules

What is the project schedule for the first project to be done with the new CAD software? What other milestones and impacts can be foreseen: steel cutting production timeline, delivery of documentation to partners, installation of new machinery? What performance targets do the shipyard's customers have, and how will this affect CAD software implementation?

Software applications and ICT networks

The landscape of different software solutions that is used for different disciplines and phases. Possible integrations that are needed between the new CAD software and existing systems and prioritization of such integrations. These can include solutions for basic design, such as various FEM, stability calculation, shape form application, as well as document and material management systems. Existing infrastructure with servers and networks should be considered to identify installations that will fit best.

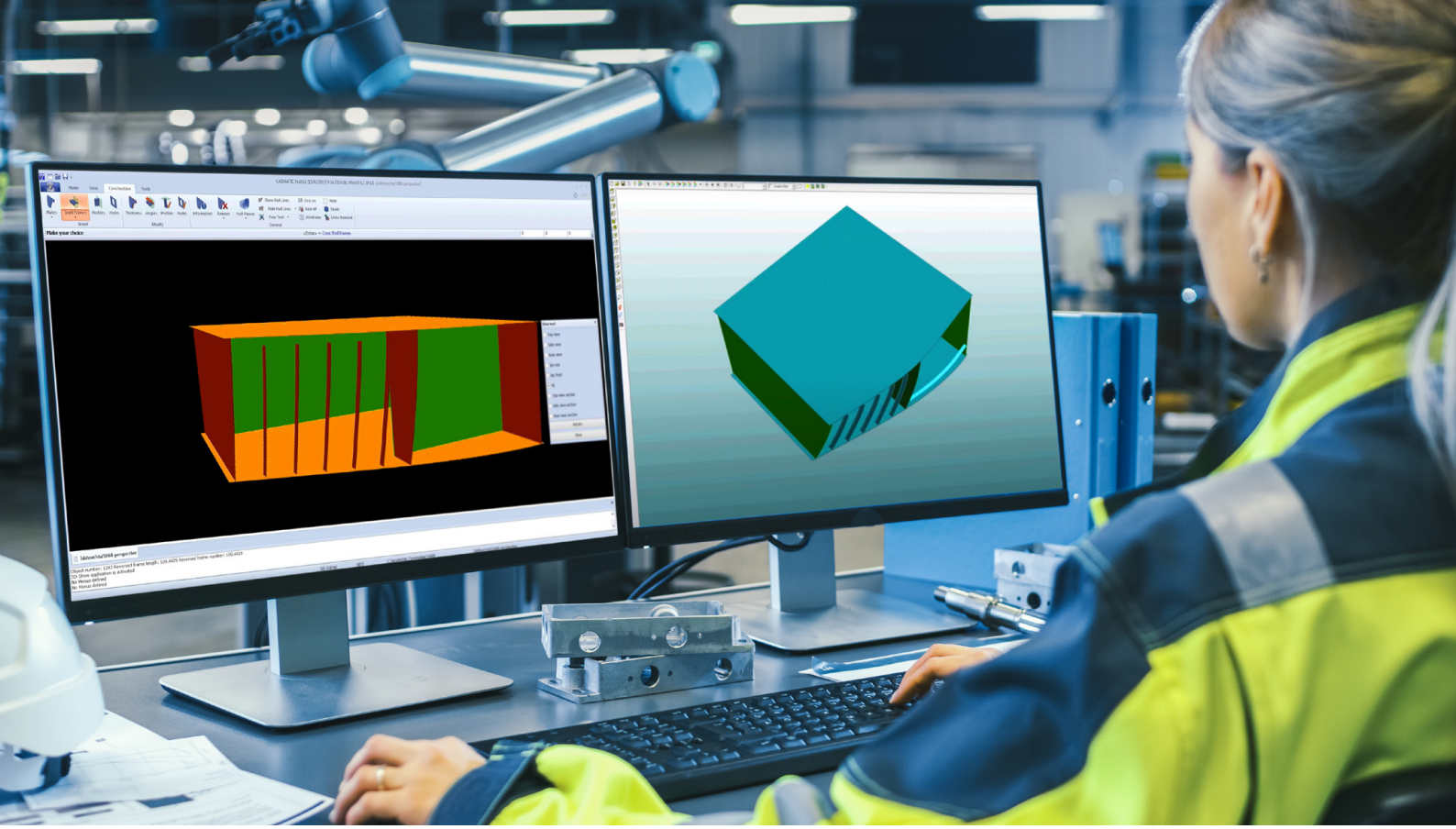
By mutual agreement of the parties involved, the process can be focused on practical issues with minimum outcomes defined in the shortest time possible. Alternatively, it can be carried out more extensively and thoroughly documented for internal audit, compliance with ISO management process standards, or progress status tracking needs..

CASE STUDY

European shipyard implementation – software customization for CNC machine

As part of the software implementation for a European shipyard, the CADMATIC software development team delivered a post-processor for a profile cutting robot and created capacity in CADMATIC to deliver customized information to the robot. The machine had been in service for many years, and its documentation was no longer available. After an investigation, the team managed to identify the required input for the CNC machine and to create the customized CADMATIC output accordingly. In this case it was important to update the shipyard processes by developing the direct interface. Having a direct data flow from the CAD/CAM solution to CNC machine was an imperative step to ensure the quality of the shipyard's production.

Read more about the case



Phase 2: Implementation plan

Once all the necessary information about the shipyard's planned software use, operations, processes, network, and requirements has been gathered, the implementation plan can be drawn up. Besides the scope of the project, suggestions for best industry practices can be tabled and options discussed.

The implementation plan contains the following:

Delivery and installation schedule

Software applications delivered online via access to dedicated customer support portal. For the initial installation, the IT infrastructure requirements should be ensured. The setup itself, virtualization needs, and license server connections can be carried out remotely. The installation manuals and online documentation contain all the information required and the steps to be performed. After the installation is set up and tested, software administrators receive instructions on how to update to new versions, add users to projects, and set up remote work.

Training plan and schedule

Identification of training courses needed for each discipline and department based on the number of employees and the scope of intended use of the CAD software. Clarification of work process and roles for each team – administrators of the software that will take care of the settings and libraries, key users, and users with special focus areas. The training plan and schedule planned to support the first design and production project. The target performance levels of designers with the new tools can be defined from training to design work, for example, as a percentage of proficiency from the first block to 100% proficiency.

Design and engineering support

Optionally, a plan to provide assistance from experienced designers can be drawn up during the first design project. The link between training schedules and project schedules/availability of people, production requirements, and other aspects are critical to consider for efficient implementation. Extra resources can be used to support users and manage Q&A while at the same time providing a temporary boost to productivity in performing the project work itself. The support resources required, design phases and disciplines needed, as well as the schedule is agreed. CADMATIC draws on a network of experienced designers across the world with access to affordable resources to facilitate this type of assistance.

CAD legacy data

When a CAD system is changed, the need arises to reuse and maintain legacy data. While there is no universal solution, there are numerous possibilities to convert and transfer data. CADMATIC experts provide advice as to the best possibilities using standard interfaces and formats or involving partners and middleware solutions.

Standards and libraries

A plan is drawn up depending on whether existing CADMATIC libraries will be used, or whether new libraries will be created. If new libraries are created, it is agreed whether the customer will create the libraries or make use of CADMATIC's services to model the libraries and set up the standards. An agreement and plan regarding steel outfitting, customization of supports, and hull norms is drawn up. The use of legacy data can be discussed on a case-by-case basis.

Documentation and digital output

Agreement needs to be reached on the style of documentation required by the shipyard and what data is contained in different documents as well as the schedule for implementation. Post-processing requirements: All post-processing data formats and other requirements for hull production as used, for example, by profile cutting machines are specified and an implementation plan is drawn up.

Possible interfaces and integrations

Integration of DMS, production machinery, PLM/PDM/ERP, and other systems with CADMATIC might be included based on the needs and IT landscape of the shipyard.

CASE STUDY

Changing scope of desired customizations after training

After an initial evaluation, based on experience with previous software solutions, the customer prepared a list of desired functionalities and a way of working with CADMATIC. During the planning phase, these requirements were considered and later evaluated again after the users gained deeper knowledge of CADMATIC. It was mutually concluded that part of the requirements were no longer necessary, as small adjustments in the customer's workflow and standard functionality of CADMATIC created more efficient outputs. The remaining requests were split in two groups – one handled with script customizations by CADMATIC specialists and the customer's administrators as part of the assistance work, and another, which was scheduled in the development road map to be delivered in the next releases.

Phase 3: Execution of training and implementation

Once the implementation plan has been drawn up and agreed, the implementation project is started. Project management at this stage ensures that the implementation project stays on track and that any deviations are identified immediately and rectified.

Training

Based on the prepared plan, training may be as short as one course for a selected group of users, or it may include several stages and levels for different groups. The main types of training and ways of arranging training are as follows:

- All users are trained for selected applications. The recommended size of a training group should be a maximum of 8 persons, and the training can be arranged on site, at the CADMATIC office, or remotely online. For remote online training, the agreed timetable will be followed, and extra resources will be reserved to assist with personal questions. This is usually needed as not everyone in the group follows the training at the same pace.
- Online training via the CADMATIC Academy offers self-study that can optimize the process for new users and serve as a self-study environment. It can reduce the need for face-to-face training by more than 50%.
- If large numbers of new users need training, training can be arranged only for selected key users that receive support from CADMATIC, while they conduct further training for their colleagues.
- Advanced training for software administrators includes topics such as setting up of specifications and norms, customization of documentation output, project administration, and other related topics.
- If needed, advanced training for scripting and API use to make further customizations can be arranged in the final stages of training for in-depth topics regarding the customization of the software and automation possibilities.

On-site assistance and engineering support

On-site assistance and engineering support as defined by the implementation plan can be started in parallel with the first training. A mix of newly trained people and experienced users from CADMATIC's staff or subcontractors can support the customer in the first design and production project or longer. This has produced good results from both perspectives – ensuring project schedules are met and that there are no delays caused by implementation of the new software, and at the same time, sharing of knowledge and skills happen in a practical work environment.

Implementation follow-up

A key account manager or managers take care of project follow-up to ensure smooth implementation. The key account management is supported by an implementation group that includes customer representatives to monitor progress and to address any issues in a timely fashion.

The typical duration of this phase ranges from 1-3 months, depending on the size of the shipyard, the scope of training, the scale of CAD use for different disciplines, and the number of designers that need to be trained.

Hybrid training mode – a combination of self-study and on-site training

Hybrid training consists of parts done as self-learning courses using study materials, and online courses and assisted training sessions with support from experienced implementation specialists. The combination of online self-study and on-site training is the most efficient way to ensure users are comfortable with new tools and operations.

CASE STUDY

Implementation at large shipyard in Asia – training of key users

A larger Asian shipyard had many people that required training. It was decided that it would be too time and resource consuming to do on-site training with large groups with trainers from Europe. The solution was training a significantly smaller group of key users, who became familiar with the training material and main principles, and who could then train the remaining shipyard staff. After the key group was trained and got hands-on experience, more training was arranged internally to transfer the knowledge and involve all users. This way, the cost and timetable requirements for the implementation were met.

CASE STUDY

Small engineering office implementation – 100% remote implementation

A small engineering office decided to start implementation during travel restrictions in 2020. Due to safety regulations, on-site in-person training was not possible. The CADMATIC Academy was used for pre-training, which allowed the users to gain good levels of proficiency with the software. Several remote training and support sessions with CADMATIC specialists helped to clarify remaining questions and ensure the optimal setup and use. With a focus on the required applications and with the use of video and online training, it was possible to implement the software completely remotely.

Phase 4: Post training and extended support

Once the training and the first project with CADMATIC software has been completed, the need for assistance services is significantly reduced or eliminated. At this stage, a range of support services are still available to keep operation at optimal levels.

CADMATIC Customer Services

CADMATIC Customer Services handles day-to-day requests and assists users and administrators with tips for optimal use of all software features. All users have access to the CADMATIC Academy with video training courses and other materials. If urgent assistance is needed, there are dedicated phone lines for different regions. Local partners are often included in the support network to ensure fast response times.

The customer support portal offers the incident management system and also contains software installer packages, software updates for new versions, links to the documentation portal, and additional information.

Technical account manager

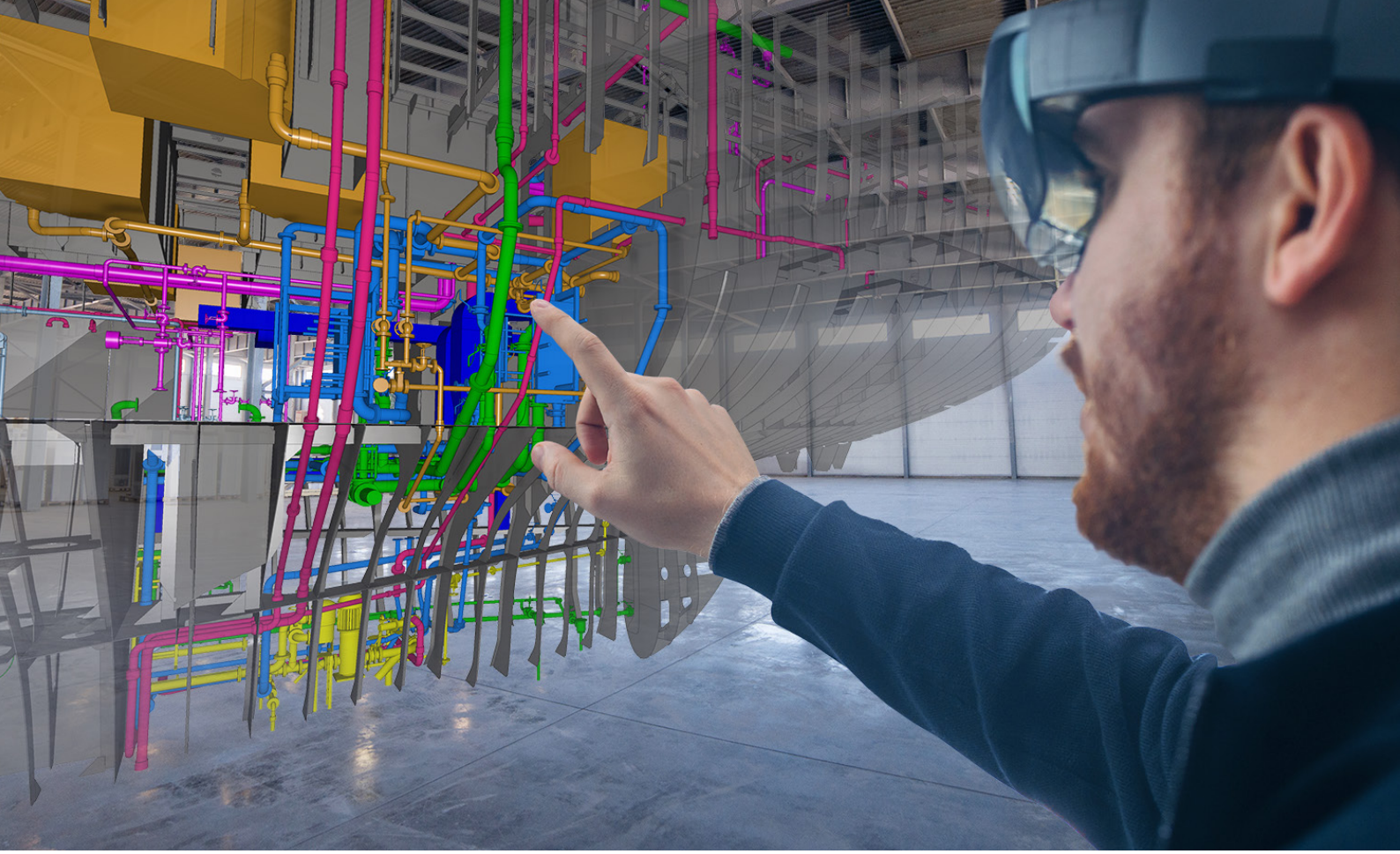
For large clients, a dedicated technical account manager can be appointed to provide regular updates, discuss users´ needs, and monitor the use of the software.

Remote project assistance

Remote project assistance can be provided for complex project setups and troubleshooting. The support personnel can set up a replica connection with CADMATIC remote replication technology after completing an NDA agreement. This way, support can be provided remotely without the need to describe the problem and causes. Specialists can remotely connect to the live project environment and quickly identify and resolve problems. A replica of the project is available to CADMATIC to gain insights into any challenges faced and to quickly and securely resolve any issues.

User community

Users are invited to follow CADMATIC LinkedIn pages and other social media accounts, and also to subscribe to our newsletter to get latest news about the software solutions, customer use cases, and other updates. The bi-annual Users' Meeting allows users to share software use experiences and learn from other user organizations. There are also other events, webinars, and customer surveys to identify software development needs.



Conclusion

CADMATIC has over 35 years of experience in implementing ship design software for shipyards. We have well-developed strategies to meet diverse needs and deal with any potential situations. Having an implementation plan and strategy that can be adapted to unique shipyards circumstances and the selected use of ship design and Information management software, gives our customers a clear idea of how the implementation process will unfold and how it can be customized and monitored.

Often, the implementation phase is only the first step in long and fruitful cooperation, as we value long-term relationships with our customers and aim to provide not only software and services, but cooperation in the future.

Want to know more? See our implementation project references and how leading shipyards and ship design companies use CADMATIC solutions in their digitalization journeys or contact us directly so we can identify what software implementation solution suits your shipyard's particular needs.

CADMATIC is a leading 3D design and information management solution developer and supplier for the marine, process, energy and construction industries.

CADMATIC
Linnankatu 52 A
20100 Turku, Finland
Tel. +358 2 412 4500
sales@cadmatic.com
www.cadmatic.com

For CADMATIC worldwide offices see
www.cadmatic.com/contactus