

# ng.zine - IT framework

Feasibility Study

CRONoMAR 

SEA OF OPPORTUNITIES

Address: Velimira Škorpika bb  
Šibenik / Croatia

Phone: +385/22/340480  
+385/22/340481

Fax: +385/22/340426

E-mail: [info@cronomar.hr](mailto:info@cronomar.hr)

Web: [www.cronomar.hr](http://www.cronomar.hr)

This document concerns:

# ng.zine – IT framework

## Feasibility Study

Author:  
**Tomislav Uroda**

Approval:  
**Malvin Villabø**

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Abstract:

*Main purpose of this study was to evaluate software system called “ng.zine”, introduced to CroNoMar by company “as2con-alveus ltd.” from Rijeka, Croatia.*

*ng.zine is a software system that enables concurrent group design of complex engineering products. It provides an integration platform for existing design tools within an organization, thus not requiring any modernization of hardware equipment or replacement of design tools. In addition, it enables designers and other parties to track design process quality from any location in the world and without changing the existing design hierarchy. Benefit of this system is a more efficient design achieved in shorter time.*

*In simpler wording: if you work in any specialized software, and you want to use output data from that software as input to another one, ng.zine will do it for you. As addition, if you change any data in “second” software it will be changed in “first” one as well. This allows you to create interaction between software that was not able to communicate before.*

**30 March 2010**

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## 2 Introduction

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The main objective for CroNoMar is to identify interesting business opportunities, and to try and implement them in business-relations together with interested cooperating partners in both Croatia and Norway.

CroNoMar's goal is to identify potentials for business improvements, and markets for new products and services in marine and marine sector, and to participate in processes to commercialize these new business propositions. The end-result shall be prosperous new jobs and activities in Croatia.

CroNoMar is spending considerable resources on stimulation activities and studies in order to identify and generate deal-flow of new commercial ideas and business opportunities in Croatia.

The types of stimulation activity will be:

- PR and publicity activities to market our services and contribute to an improved business oriented culture and attitudes in the region. Establish good relations to relevant public and private development agencies where potential idea-holders seek assistance and contribution
- Proactivity towards national R&D-institutes, educational institution and students from the region to be trained in entrepreneurship and look for marine relate business opportunities during their studies
- Establish proactive cooperation's with existing business communities, national and regional public authorities, with financial and knowledge development organizations, branches, clusters, unions, associations, etc, in order to highlight non-released potentials and opportunities for new businesses and new business models, and jointly take new ideas into:
  - Feasibility studies
  - Pre-projects
  - Development projectfor further development and evaluation as new business opportunities

The prime objective from CroNoMar with feasibility studies is two-sided:

- Identify new marine and marine business concepts that are relevant as new competitive products and services to be produced and marketed from Croatia.
- Identify cooperative partners in both Croatia and Norway that have interest and capabilities to be our partners in such commercialization.

A secondary result is that these studies very likely will identify considerable improvement potentials by upgrading the existing structure and operational focus of integrated business -branches and –sectors. Such business opportunities have the greatest potential but are very demanding and can only be achieved by long term close cooperation with all parties from individual private companies and local and national agencies and policy makers.

This study belongs to group of new business opportunities, where the topic we will talk about is IT development as powerful tool for simplifying and speeding-up designing processes in ship design companies, shipyards, etc. Authors of this concept call it “**ng.zine**” and we will refer to that name in following lines of the feasibility study. This feasibility was written together with people from as2con, where their knowledge of issues and experience in this IT segment was precious.

### *ng.zine Software System*

**ng.zine** is a software system that enables concurrent group design of complex engineering products. It provides an integration platform based on real-time data exchange between design tools it integrates. It is intended to integrate existing design tools within an organization by not requiring any modernization of hardware equipment or replacement of design tools. In addition, the **ng.zine** system introduces the multi-stakeholder approach into the design process. Multi-stakeholder approach enables designers and other parties to track design process quality by setting the preferred intervals for the design parameter values. The system enables design tracking from any location in the world and without changing the existing design hierarchy. Therefore, besides being an integration platform, **ng.zine** system also serves as a decision support utility.

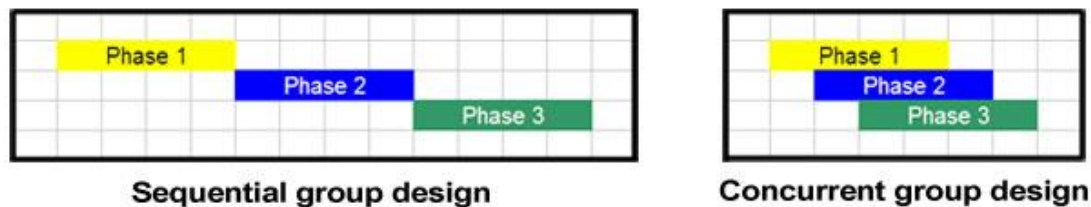
The prototype of the **ng.zine** software system has been developed by as2con-alveus ltd. The development was partially financed by FIPRO Foundation of Technology-Innovation Center Rijeka, Ltd. Croatia.

### 3 ng.zine Motivation

The idea of **ng.zine** is motivated by the needs of design processes of complex engineering products (ships, airplanes, vehicles etc.) that consist of many phases and involve many experts, combining knowledge of various fields. With the help of information technology, **ng.zine** enables interaction of all parties involved in the design process through concurrent and group design thus improving the quality and control over such design processes.

**Group design** considers a real-time, design decision-making and consideration of requests and wishes from all involved parties in the design process (designers, producers, buyers, suppliers etc.).

**Concurrent design process**, in comparison to sequential design process that is in wide use today, considers simultaneous design of multiple mutually dependent design phases. Concurrent design encourages the use of all available resources at the same time, adding flexibility and enhancing innovation during the design process. Sequential design process consists of strict hierarchy between design phases that are scheduled to start new phase after the previous is completed.



The concurrent group design using **ng.zine** considers:

- Real-time communication between the parties (information flow of the design parameters between different software tools used during the design process).
- Insight into the progress of product development and into satisfaction of parties involved in the development.

Design and engineering process is compounded of several iterations, where standard methodology is sequential process of iteration. Idea of ng.zine software system will then represent matrix process organization in IT heart of design office.

Such a matrix system was revolution in construction strength analysis, when finite element method – FEM was introduced. FEM analysis was speeding up calculation processes several hundred times, reaching limits where “hand” calculation was not able to reach.

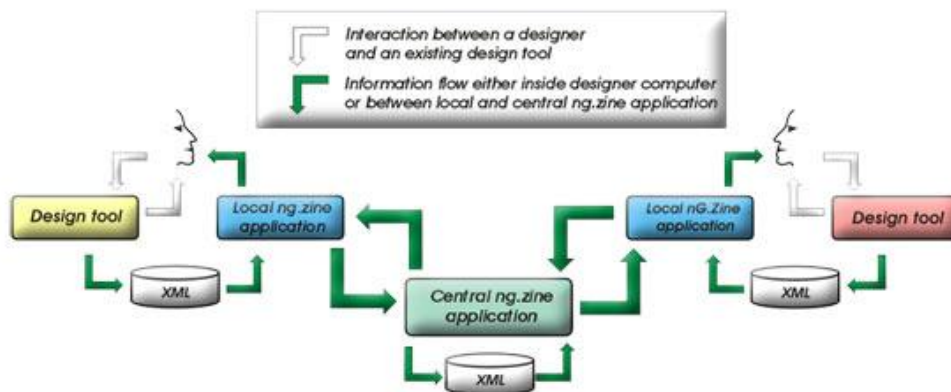
This is not such a revolution, but it can speed up processes for several times, allowing ship designing offices to “play” more with design. At the same time, they can get all data about strength, hydrostatic, hydrodynamic, stability, etc. It is a real time data analysis in direct relation with design.

## 4 ng.zine Platform and Process

### ng.zine Platform

IT platform for **ng.zine** concurrent group design system is presented in the following figure and consists of:

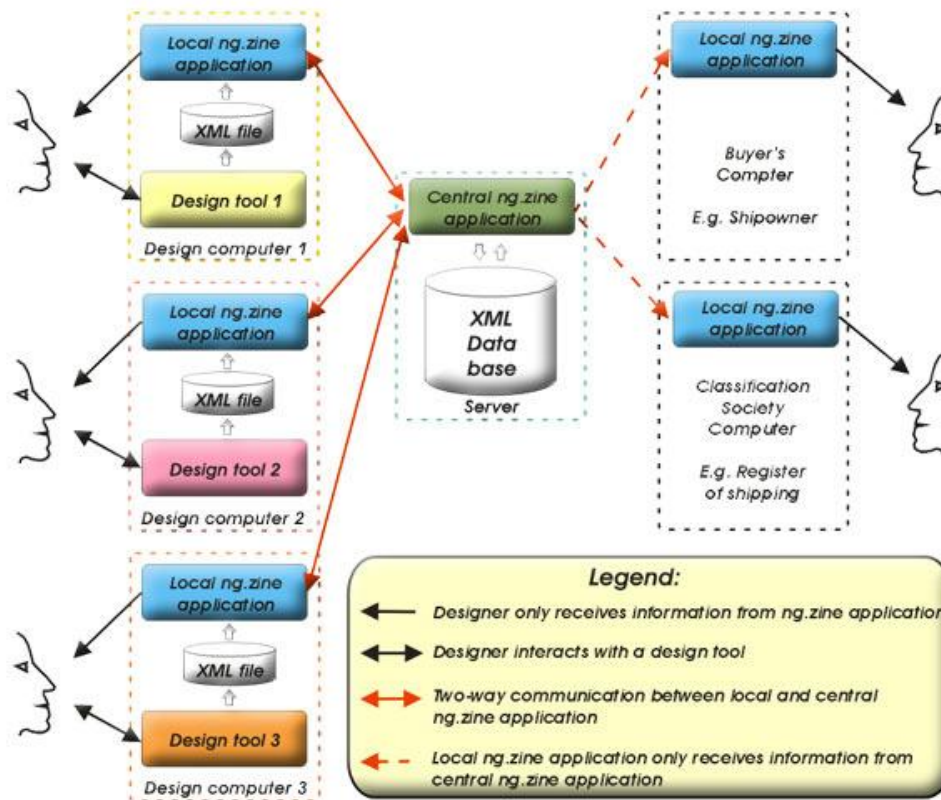
- Central **ng.zine** application located on a server computer (**ng.zine** server). This is a heart of ng.zine software system coordinating all allocated computer units and their software
- A number of local applications located on users' computers (**ng.zine** agent). Existing software programs on their allocated computers. They can be different software programs, used by classification society, design office, shipowner office, etc.
- XML project data base located on the server (XML is open source data format). This would be a brain of ng.zine software system. XML is decoded data format communicating between different software packages of programs.



## ng.zine Process

**ng.zine** agent detects the changes that have occurred in a design tool, converts the newly occurred data to XML and sends it to the **ng.zine** server. **ng.zine** server combines XML data from all design tools to a single parametric model and stores it into the data base.

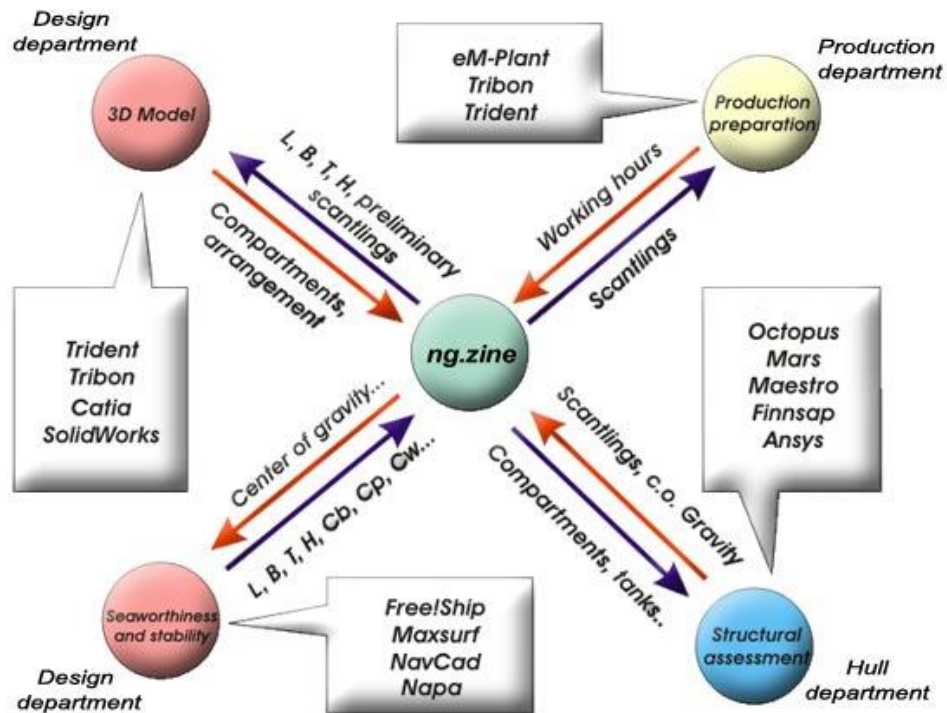
**ng.zine** server also provides the current parametric model status to all local **ng.zine** agents. User is notified by **ng.zine** agent about changes in the current model status and new data is implemented in user's design tool automatically. Described process is shown in figure below.





## 5 ng.zine Application in Ship Design

**ng.zine** is primarily intended to be used in ship design process, making a ship design more efficient in shorter time. For off-shore structure design, same benefits in efficiency can be achieved. **ng.zine** is intended to perform communication between different design tools that are currently used in ship design (such as TRIBON, TRIDENT, CATIA, SOLIDWORKS, OCTOPUS, MARS, MAESTRO, FINNSAP, ANSYS, FREESHIP, MAXSURF, NAVCAD and NAPA) as shown in figure below. Some of the tools mentioned have already been integrated. Furthermore, customized integration can always be adjusted for a particular user.



So far ng.zine has been presented on several conferences of marine technology where its potentials have been recognized by software developing companies. Delta Marine Design Company from Helsinki is already using their services in the company, where application for Delta Marine is created to communicate between Catia and Napa.

## 6 Benefits of the ng.zine System

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The following benefits emerging from the implementation of ng.zine, within a design process can be mentioned.

- Creation of a single product model by exchanging parametric data  
*Exchanging parametric data from already in use software programs, doesn't limit communication of such a program with a group of familiar software packages or programs. In other words if you want to have software system communicate between you don't have to reeducate personnel on new software system, but they can stay work in their proven, well known software. In that case ng.zine will solve communication problem with software programs or packages.*
- Immediate design errors detection due to the real-time data exchange  
*Having all software programs communicating in real time, possible design errors will be detected in other software programs as error in ship characteristics or classification requirements.*
- Shorter design process due to simultaneous execution of design phases, one-time modeling and annulled time for error corrections  
*Standard process of planning a new ship, where design outputs are inputs for stability, hydrodynamic or some other "next steps" in process of planning a new ship, can now overlap. At same time register of shipping as classification society can see all phases of designing or analyzing in real time, have than ability for reaction or suggestions in real time.*
- Designers integrate their expertise into the system by using design preferences and therefore, reusing their experience  
*There is no need of changing already proven and stable software solution with new one just because software system requires that. Instead or reeducating on new software program, personnel can improve their skills and widening their knowledge about used software program.*
- Accumulation of the complete history of the certain design evolution provides knowledge data base for future projects
- More efficient design solutions achieved by using the multi-stakeholder approach  
*In other words this is multi level data analyze by using different software programs at same time.*

7 SWOT Analysis

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|---|---|
| <p><b>Strength</b></p> <ul style="list-style-type: none"> <li>• Customizable to any workflow of a design office or a shipyard</li> <li>• Implementation without replacement or upgrade of the existing software designing tools</li> <li>• Applicable to multi OS platforms</li> <li>• No competition in the price range</li> <li>• No competitive system that operates on similar principles</li> <li>• Acknowledged by the professional audience (DELTAMARIN, NAPA, etc.)</li> <li>• Low hardware requirements</li> <li>• DSL connection for system communication over internet is enough</li> <li>• Real time presence of classification and customer in design stage</li> </ul> | <p><b>Weakness</b></p> <ul style="list-style-type: none"> <li>• New concept - not an established product</li> <li>• Requires deep insight into design office/shipyard procedures before implementation</li> <li>• Requires adjustments in case of major upgrades of software design tools integrated within system</li> <li>• Changes in the workflow schemes or replacement of software tools in an organization would require a re-implementation of the system</li> <li>• Client to client ng.zine software platform development. Custom made systems</li> </ul> |
| <p><b>Opportunities</b></p> <ul style="list-style-type: none"> <li>• Applicable to other industries besides shipbuilding or in different products design</li> <li>• Capacity to serve as a decision-making support system for service-oriented organizations and institutions. Design errors can be recognized in the early stage/real time</li> </ul>  | <p><b>Treats</b></p> <ul style="list-style-type: none"> <li>• PLM software packages</li> <li>• Bankruptcy of ng.zine or buyout with intention of closing down ng.zine as competition</li> <li>• Software developers can enter this market, but that includes many man-days in software development</li> </ul>   |

## 8 Conclusions & Recommendations

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Basic conclusion would be that **ng.zine** concurrent group design system makes the product design more efficient in shorter time. It is partially similar to PLM solutions available on today's market, but it has a major advantage of integrating already present design tools in certain organization and can easily integrate additional design tools. This makes it a cheaper solution for the customer and furthermore, employees don't have to adapt to the new software.

Another advantage of **ng.zine** in comparison to PLM is that it provides the information on design process quality. However, disadvantage of the **ng.zine** system is that it needs additional integration work prior to the installation in specific organization, while PLM solutions are installed as pre-integrated software packages so that maintenance of the PLM is simpler.

**ng.zine** is a good choice for organizations with a well established design process and already having a high level of IT. Organizations that are about to increase the IT level and make organizational changes would probably rather choose some of the PLM solutions available on the market in case that PLM solution that fits their needs actually exists on the market.

CroNoMar recognizes the potential of ng.zine software system solution. Therefore CroNoMar would like to act in two steps:

1. CroNoMar would like to test the market for such software system solution. Primarily this would be done in CroNoMar's domestic grounds: Croatia and Norway. Several shipyards and engineering companies would be contacted to test their interest for ng.zine as part of their software system. So far, many of them are using PLM (product lifecycle management) paying high fees and they are still not able to communicate with all associates in system.
2. If market testing brings positive feedback about ng.zine system, CroNoMar would like to discuss a joint venture with as2con, where new company would be set-up. This new company would be software developer and an integrator of the ng.zine system globally.

In this joint venture, as stake holders as2con and CroNoMar should be investors together with other soft co-findings from different sources. as2con would be a major shareholder bringing in the company knowledge and software development. CroNoMar would be a minor shareholder where networking channels and sales channels would be their stake. Additional soft co-funding would be brought together to set-up a company. Company should be set-up in Croatia with a tendency to work globally.