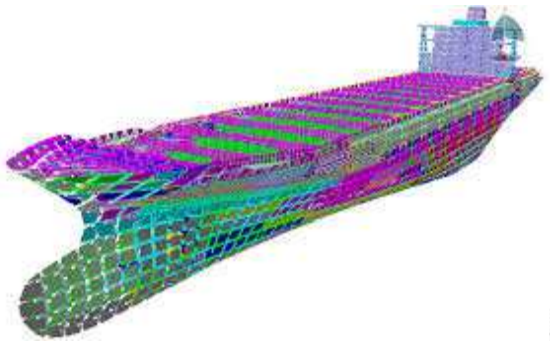
Technology Surveillance Report



Best practices in operations during production and exploitation processes

Fundación para o Fomento da Calidade Industrial e o Desenvolvemento Tecnolóxico de Galicia

AUX NAVALIA

ATLANTIC AREA
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Executive Summary

This Technology Surveillance Report has been conducted by **FOUNDATION FOR THE PROMOTION OF INDUSTRIAL AND TECHNOLOGICAL DEVELOPMENT QUALITY OF GALICIA (FFTG)** under the proyect **AUXNAVALIA PLUS** to be constantly ahead of published developments in the field of Best practices in operations during production and exploitation processes in naval industry.

The aim of this report is to analyze the state of the art of development and identify future trends and applications of the technology in Europe. With this information we will have to measure the sector of the technology and make a preliminary analysis of how the technology has developed throughout time and its maturity level, what are the main research lines and most original developments and how the analyzed technology is positioned.

Furthermore, it will be an information tool in order to promote, disseminate and update the specific knowledge in the area, bringing to the auxiliary sector of the Naval Atlantic area the latest developments about the technology of interest.

Based on the analysis of the information gathered, it appears that most of the developments have been led by North American organizations, wherein the **UNIVERSITY OF NEW ORLEANS, KRATOS PUBLIC SAFETY & SECURITY (PSS) and WESTERN WASHINGTON UNIVERSITY** are some examples of active organizations in the area.

In other regions, countries such as Brazil invest a lot in knowledge development. Brazilian shipyards face the typical problems of new large industrial enterprises in emerging economies that are mandated to become "*national champions*". Local sourcing may not only be required by local content rules but may also serve as a mechanism to reduce the risks associated with delivery delays and the lack of on-site assistance by global suppliers. However, local suppliers may have limited technological capabilities to comply with the enterprise demands related to product and production processes. Those suppliers may not even be located in organized clusters in order to benefit from the externalities associated with developing the technological capabilities of local firms.

One of the technology partners is MARIN. They work together with CENPES -the naval architecture branch of Petrobras- and the University of São Paulo. The oil companies are forced to spend a small percentage of their turnover on R&D. MARIN has a local agent and a shared simulator facility. There is competition from the universities, who in practice work as engineering firms.

MARIN is currently considering setting up a research foundation in Brazil, in order to better position themselves for the local funding. STC has an active co-operation with SENAI in the field of vocational training, including shipbuilding. This Rotterdam based institute is also active in the field of consultancy for Transpetro (inland shipping), Vale (training) and CSN (consultancy tug operations). It is almost accredited for VTS-training for the Brazilian ports.

Technological capabilities refer to a firm's ability to make effective use of technological knowledge in Engineering/production, and innovation in order to be competitive in price and quality. From this perspective, in the ship-building industry, there is a need to develop capabilities related to ship and shipyard design, standard ship construction procedures, and operations management of the shipbuilding process (production capabilities). In addition, there is the need to develop capabilities to incorporate new production processes and product-related technologies (innovation capabilities) into subsequent designs.

As stated in an earlier section, firms in emerging markets normally follow a different technological trajectory from that seen in developed countries. Technological knowledge may be acquired by initially searching for, operating, and mastering technology developed by others, rather than developing technology locally. Technology trajectories typically follow a sequence of initially developing operational or production capabilities; design, engineering and associated management capabilities; and eventually, de-veloping local R&D capabilities.

Shipbuilding projects represent an industry that seems very well suited for knowledge transfer research through creating, sharing and applying knowledge as well as through feeding the valuable lessons learned and best practices into corporate memory in order to foster continued organizational learning. Often there are similarities between the ships and experience from previous shipbuilding projects can be helpful in reducing errors, generating fewer questions, or producing better decisions.

1. Introduction

A best practice is a method or technique that has consistently shown results superior to those achieved with other means, and that is used as a benchmark. In addition, a "best" practice can evolve to become better as improvements are discovered. Best practice is used to describe the process of developing and following a standard way of doing things that multiple organizations can use.

Best practices are used to maintain quality as an alternative to mandatory legislated standards and can be based on self-assessment or benchmarking.

Particularly, building ships on time, within budget and fulfilling technical requirements are important factors in commercial shipbuilding. However, experience has shown us that shipbuilding projects sometimes have difficulties reaching these goals because they do not employ these best practices. Setting ambitious requirements, new designs often making little use of prior ship designs, starting construction without a stable design, are all examples of inefficient practices causing ships to cost more than they otherwise should[1].

To ensure that design and construction of a ship can be executed as planned, the shipyards and buyers must not move on until critical knowledge is attained. According to Wang et al.[2], knowledge constitutes a key strategic resource for

[1] Francis, P. L. (2009). High Levels of Knowledge at Key Points Differentiate Commercial Shipbuilding from Navy Shipbuilding: Government Accountability Office, US.

[2] Wang, J., Gwebu, K., Shanker, M. and Troutt, M. D. (2008). "*Application of agent-based simulation to knowledge sharing*", Decision Support Systems, Vol. 46 No. 2, pp. 532-541.

shipbuilding organisations. It is an asset that can prove vital in an increasingly competitive shipbuilding market. Consequently, the effective management of knowledge has become a critical organisational capability for both the ship buyer and the shipyard. Knowledge embedded in the project processes and the employees' skills provide the companies with unique capabilities to deliver successful projects.

In shipbuilding projects there is a need for transferring users' knowledge to the development process, especially in the key shipbuilding phases. However, in many circumstances, that knowledge in the shipbuilding industry is mostly tacit knowledge[3] and highly based on individuals' experience and perceptions. Another problem is that knowledge transfer across projects is difficult due to, for example, lack of practice, and pressure of time and an informal knowledge transfer system. As a consequence, as each new project is started, there is a tendency to "*reinvent the wheel*", rather than learn from the experiences of previous projects.

2. Analysis of Scientific Publications

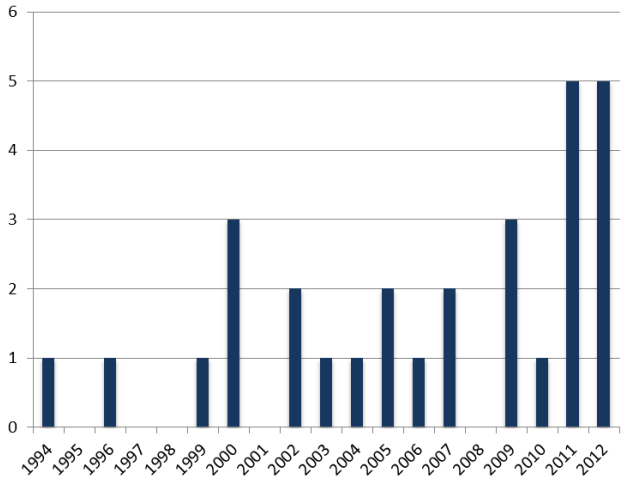
The search strategy includes different methodologies. The main one consists in using keywords and concepts provided by the **Auxnavalia Plus** project partners, and others learned during the documentation process before designing the search strategy. In this search the keywords were directed to focus best practices, lessons learned and management and transfer of knowledge.

Finally, the search was done by using generic words such as *best practices, lesson learned, knowledge management, knowledge transfer, shipbuilding, naval,* etc, and complementing this search with methods and techniques mentioned previously, generating a sample of **29 publications.**

Regarding the literature, It has been used a search strategy in order to identify those scientific papers published since 1994 and related to naval industry.

Some simple conclusions could be recoverd from the 29 scientific publications, such as the evolution of publications. In this case the following figure shows an irregular trend, with a high interest in the last 2 years with 5 publications per year.

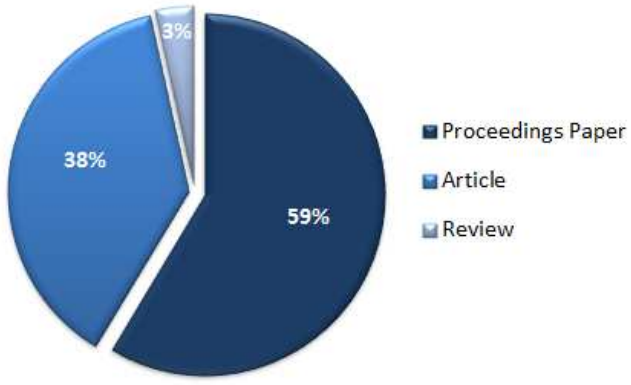
[3] There are two main types of knowledge that are important to distinguish between: tacit and explicit knowledge. Tacit knowledge is described as personal, hard to formalise and hard to communicate to others. The other type of knowledge, explicit knowledge, is a transmittable in formal, systematic language. It is a type of knowledge that is easier to transfer since it can be expressed in words and numbers in manuals, patents, reports, documents, assessments and databases.



Source: Own generation based on scientific publications databases

Figure 1. Evolution of scientific publications

Regarding the distribution of scientific publications by document type, Figure 9 shows that proceedings papers are the first source of broadcasting the studies in the area, representing 59% of the total scientific documents published. As a second type, appear articles representing a 38% share, while the remaining 3% are reviews.



Source: Own generation based on scientific publications databases

Figure 2. Publications type

Table 1 shows the main sources of information, ie journals, congresses, conferences, workshops, yearbooks or symposia which have been published from 1994 to the present.

These relate mainly to managing technology and knowledge, like **INTERNATIONAL CONFERENCE ON MANAGEMENT INNOVATION, MANAGEMENT OF TECHNOLOGICAL CHANGES, MANAGING KNOWLEDGE WITH TECHNOLOGY**, among others.

Table 1. Main sources

Source	Total
INTERNATIONAL JOURNAL OF PRODUCTION ECONOMICS	2
AUTOTESTCON 2000: IEEE SYSTEMS READINESS TECHNOLOGY CONFERENCE	1
DYNA	1
ELECTRONIC LIBRARY	1
GLOBAL ENGINEERING AND MANUFACTURING IN ENTERPRISE NETWORKS: GLOBEMEN	1
IEEE INTERNATIONAL CONFERENCE ON TECHNOLOGIES FOR HOMELAND SECURITY	1
IFIP/IEEE INTERNATIONAL SYMPOSIUM ON INTEGRATED NETWORK MANAGEMENT (IM 2009)	1
INTERNATIONAL CONFERENCE ON MANAGEMENT INNOVATION	1
INTERNATIONAL JOURNAL OF NAVAL ARCHITECTURE AND OCEAN ENGINEERING	1
INTERNATIONAL JOURNAL OF PRODUCTION RESEARCH	1
INTERNATIONAL JOURNAL OF TECHNOLOGY MANAGEMENT	1
JOURNAL OF COMPUTER INFORMATION SYSTEMS	1
JOURNAL OF WORLD BUSINESS	1
MANAGEMENT OF TECHNOLOGICAL CHANGES	1
MANAGING KNOWLEDGE WITH TECHNOLOGY	1
NAVAL ENGINEERS JOURNAL	1
NUCLEAR ENGINEERING AND DESIGN	1
PROCEEDINGS OF INTERNATIONAL CONFERENCE ON CONSTRUCTION & REAL ESTATE MANAGEMENT	1
PROCEEDINGS OF THE EUROPEAN CONFERENCE ON KNOWLEDGE MANAGEMENT	1

Source	Total
PROCEEDINGS OF THE INTERNATIONAL CONFERENCE ON MANAGEMENT SCIENCE & ENGINEERING	1
PROCEEDINGS OF INTERNATIONAL CONFERENCE ON BUSINESS EXCELLENCE	1
PROCEEDINGS OF INTERNATIONAL CONFERENCE ON INTELLECTUAL CAPITAL, KNOWLEDGE MANAGEMENT AND ORGANISATIONAL LEARNING	1
PROCEEDINGS OF THE ASME TURBO EXPO	1
PROCEEDINGS OF THE INTERNATIONAL CONFERENCE ON INFORMATION AND MANAGEMENT SCIENCES	1
RESEARCH IN ENGINEERING DESIGN-THEORY APPLICATIONS AND CONCURRENT ENGINEERING	1
TECHNOLOGY TRANSFER IN A GLOBAL COMMUNITY	1
INTERNATIONAL CONFERENCE ON ICT AND KNOWLEDGE ENGINEERING	1
TRANSPORT RESEARCH	1

Source: Own generation based on scientific publications databases

Finally, the following table lists the main entities that have published in specialized journals in the technological area of interest, where the leadership of NorthAmerica is shown, with a 33% of share.

Table 2. Top Entities

Entities	Total
UNIVERSITY OF NEW ORLEANS	1
UNIVERSITY OF DEL NORTE	1
FINCANTIERI CNI SPA	1
KRATOS PUBL SAFETY & SECUR SOLUT INC	1
UNIVERSITY OF UDINE	1
SEOUL NATIONAL UNIVERSITY	1
CONSTANTA MARITIME UNIV	1
UNIV GUILAN	1
UNIVERSIDAD POLITECNICA DE CARTAGENA	1
UNIV ROMA TRE	1
WESTERN WASHINGTON UNIVERSITY	1
UNIV POLITECN VALENCIA	1
CONSTANTIN BRANCUSI UNIV	1
JIANGSU UNIVERSITY	1
DALIAN UNIVERSITY	1
NANJING UNIV AERONAUT & ASTRONAUT	1
IMPACT TECHNOL LLC	1
MONASH UNIVERSITY	1
UNIVERSITY OF MONTREAL	1
UNIVERSITY OF MARYLAND	1
UNIVERSITY OF TASMANIA	1
UNIVERSITY OF QUEENSLAND	1
UNITED STATES DEPARTMENT OF DEFENSE	1
RAYTHEON CO	1
DE MONTFORT UNIVERSITY	1
UNIVERSITY OF MINNESOTA SYSTEM	1

Source: Own generation based on scientific publications databases

Knowledge management is the deliberate and systematic coordination of an organisation's people, technology, processes and organisational structure in order to add value through reuse and innovation. Furthermore, the claims that this coordination is achieved through creating, sharing and applying knowledge as well as through feeding the valuable lessons learned and best practices into corporate memory in order to foster continued organisational learning.

Shipbuilding projects represent an industry that seems very well suited for knowledge transfer research. Often there are similarities between the ships and experience from previous ship-building projects can be helpful (Kim and Seo, 2009). Further, improved knowledge transfer could be useful to help the companies improve their processes and create total value (Dwivedi and Maffioli, 2003). From this, it follows that it is essential for individuals and teams working for project-based companies to acquire and draw upon the knowledge created by other individuals and teams (Ajmal et al., 2009).

Study mechanisms support improved knowledge transfer. Effective transfer and use of knowledge from prior shipbuilding projects and from operations at sea to the shipyard reduces errors, generates fewer questions and produces better decisions.

McKesson[4] of the University of New Orleans proposed two types of knowledge: technical (engineering) knowledge, and programmatic (Naval Ship Acquisition Process) knowledge. The nature of technical knowledge is well known, but programmatic knowledge may require definition. Programmatic knowledge is the knowledge of the naval design and acquisition system that determines what would actually come out of the acquisition pipeline, with a given concept design as the input. The author's research has identified two areas where the tools of Knowledge Management **could benefit the early stage** design process. The first of these is a **Decision Support System** that would capture historical data on the evolutions made by previous ship designs, and package this data in a form usable to the concept design engineer. The second recommendation of this project is the **creation of an electronic Community of Practice for the concept design community**.

In the same line, a group of researchers in the University of Del Norte[5] presents an article which described a R&D process, allowing structure, as well as developing and integrating a **management model based on knowledge** from the joint three fundamental pillars: the **technology management, talent management, human knowledge management and structural support of technologies information and knowledge**, the application of the model was consolidated in COTECMAR, a Science and Technology Corporation belonging to the naval sector of Colombia.

The theorical basis of research development consists of organizational learning, skills management of human talent, the models of knowledge management, technological monitoring, infrastructure knowledge, business intelligence, technology transfer and own processes of innovation and development of shipbuilding industry in design, construction and repair of ships and craft.

The challenge laid out by research team was associated with the development of policies, strategies, methodologies and tools to manage knowledge, developing skills and competencies from individual experiences, group and organizational, so that short-term fostered a culture of generation innovation for competitive and comparative advantages in the naval sector.

They designed a Web platform as a tool for developing knowledge management tasks, in this case communities of practice, virtual communities and knowledge networks, which is active in the organization.

Researchers at the Italian University of Udine[6] explored how formalized methodologies can effectively support the implementation of

[4] McKesson, CB (2012). "*The Application of Knowledge Management in Early-Stage Warship Design*". Naval engineers journal | 124 (4): 101-109

[5] Wilson, NB; Carmenza, LA; Luis, RRJ (2012). *"Model Based on Knowledge Management for Intensive Organizations Naval Engineering Application: Colombian Naval Sector".* 2012 Tenth international conference on ict and knowledge engineering | : 25-30 2012

[6] Formentini, M; Romano, P (2011).*"Using value analysis to support knowledge transfer in the multi-project setting"* International journal of production economics | 131 (2): 545-560

knowledge transfer practices in the multi-project setting.

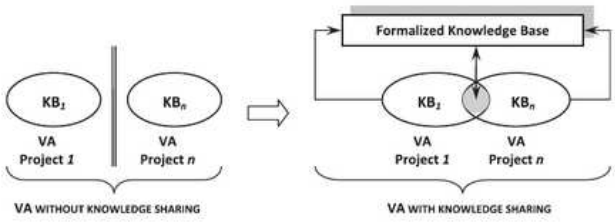
Shipbuilding is among the most complex multi-project settings. A cruise vessel is characterized by capacity on board up to 3500 passengers, a total weight up to 110,000 tonnes, and a length up to 290m. The building process can last up to 22 months. Cruise vessel design and production activities are engineered-to-order, according to specifications mainly determined by the ship owner itself. In shipbuilding, every stage of the design and operative process must follow strict rules imposed by naval registries.

Project management requires the integration of several ship sub-assemblies, each one consisting of a huge number of components. These sub-assemblies are built separately and then assembled. In this manner, several projects need to be launched simultaneously during each ship construction, sharing common resources (people, information, time, machineries, etc.).

In addition, complexity increases because in a shipyard up to three ships can be built at the same time. Also the network of suppliers and subcontractors involved in design and production activities is really wide and heterogenous.

The combination of a large and systemic product with an extremely high environmental complexity complicates the task of making product development choices.

The Italian University propose a knowledge collection and transfer model grounded on the Value Analysis (VA) technique, empirically developed and validated through an action research in the shipbuilding industry.

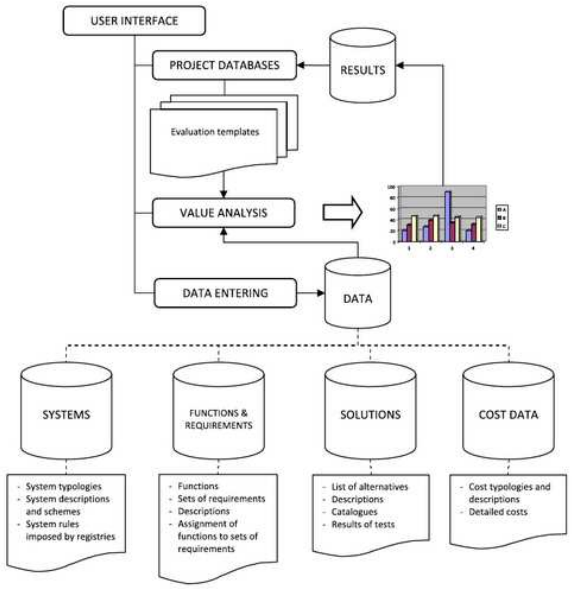


Source: Formentini, M; Romano, P (2011)

Figure 3. Sharing knowledge across multiple VA studies

After recognizing the need of a support tool to address the knowledge collection and transfer problems found in the company at the beginning, the team translate the VA-based model into a computer based tool to routinize its implementation in VA projects. They develop a "stand-alone" application, easy to be implemented and used in the MS Excel environment, using Visual Basic macros to define the main functions and to create linkages with internal databases. Figure 4 illustrates the structure of the application.

The proposed model facilitates decision making across multiple projects in the cruise ship design by stimulating the **reuse of the available knowledge base and the exploitation of information** needed to identify design solutions to solve the **trade-off between functional requirements and available resources.**



Source: Formentini, M; Romano, P (2011)

Figure 4. VA Software Structure

When studying knowledge transfer in project-oriented firms it is important to distinguish between main paths on which the knowledge can be transferred. According to Salter (2003) three main paths are: 1) from one project to another parallel or subsequent project, 2) from one project to central or supportive units (e.g. project office) in the base organisation, and 3) from the base organisation to the project.

In a project-oriented firm the project organisations are often distanced from the other main supportive functions such as finance, IT, human resources, etc. The projects are often located in separate locations and it is only the managers of the projects that communicate with the main functions of the firm.

The management of knowledge between projects is often insufficiently prioritised in project-oriented firms. Knowledge is generated within one project, and then forgotten. The transfer and sharing of knowledge in project-oriented firms has proven to be a challenge.

This is due to the nature of these types of firms: the dispersed organisation, the time pressure, the changing environments, limited resources, and the temporary management structure. The firms usually have forward focus and forget how important it is to gather information from previous projects.

To enable effective transfer and sharing of knowledge across projects, knowledge transfer and sharing mechanisms are the means by which individuals' access knowledge and information from other projects. These mechanisms can be defined as the formal and informal mechanisms for transferring, sharing, integrating, interpreting and applying know-what, know-how, and know-why embedded in individuals and groups that will help in the performance of the projects tasks.

Many firms have implemented information and communication technology (ICT) solutions such as project databases, intranets and databases with lessons learnt. These are formal mechanisms that focus to a large extent on information and explicit knowledge. However, a lack of distinction between information and knowledge represents a criticism towards ICT solutions for the management of knowledge. Furthermore, it is a weakness that this mechanism does not allow interactions and customisation of solutions to the knowledge seeker's problems. ICT solutions can be a knowledge transfer mechanism, but never a replacement for social interaction.

The implementation of ICTs to support collaborative knowledge management in automobile and manufacturing industries has proved to be effective. The application of ICT for knowledge management in other industries

(such as construction) has not been so successful. The literature on using ICTs to support knowledge management was contradictory. On the one hand, some researchers advocated the use of ICTs for effective knowledge management. On the other hand, some scholars were sceptical regarding effectiveness of ICTs for successful knowledge leveraging.

An effective computer based collaborative tool is of key importance for knowledge management and productive co-design in shipbuilding. Several options are possible here. The first is to use universal systems designed not only for shipbuilding but applied in other spheres for collaborative knowledge management and information sharing. The second possibility is to create a proprietary collaborative platform to satisfy the specific needs of a company´s cooperative work.

Firms need to make easy effective knowledge transfer between employees and participants in the supply chain. The form to this transfer is very different depending on the size of the company. For example, one company could be an entrepreneurial firm which has a simple organisational structure and uses a standard collaboration tool while the other company is a multinational enterprise and having a more complicated matrix organisational structure, with several branches around the world, more employees, and a larger international customer base[7].

In the multinational firm, management is concerned about the effectiveness of cooperative work and knowledge management within the group and with external parties. They try to minimise travel costs, which are rather significant when taking into account the geographical dispersion of the local offices, ship-owners, and shipyards. For these purposes the company utilises modern computer-supported cooperative design tools. The collaborative instruments are more complicated, customer-designed, and serve to overcome a dual collaborative problem: cooperation with the external parties and successful teamwork.

Firms with matrix organisation will use sophisticated ICT tools assisting to gather and exchange information, support knowledge management and facilitate collaboration. This type of organisation is regularly utilised by firms that deal with projects which need diverse combinations of knowledge, competence and skills from both the internal and external environment.

The advantage collaborative system includes adjustment to specific needs and high speed of information sharing. The high price for such a collaborative instrument might be a disadvantage for some design companies since smaller firms often cannot afford such an investment. Thus, the custom-made collaboration tools are more appropriate for companies with a broad network of collaborative partners and internal collaborators.

Otherwise, the entrepreneurial firms will have standard and simple ICT tools supporting knowledge management. The benefit off the self-serve system includes simplicity of administration and use, diversity of available tools, and lower maintenance cost.

[7] Solesvik, M; (2011) .*"Collaborative knowledge management: case studies from ship design".* International Journal Business Information Systems. Vol 8. Nº2

3. Bibliographic References

To complement the results of the searches, additional information is provided concerning the top companies in the area. In this section we attach a brief summary of the organization and relevant data that may be of interest.

UNIVERSITY OF NEW ORLEANS (UNO)

2000 Lakeshore Drive
New Orleans, LA 70148
T: 888-514-4275
http://www.uno.edu

The University of New Orleans (originally called Louisiana State University in New Orleans) was established by Act 60 of the 1956 Louisiana Legislature in the wake of a citizens' movement to bring tax-supported higher education to the metropolitan area.

Culturally, socially, economically, and intellectually, the University of New Orleans is one of the major assets of the City of New Orleans and the State of Louisiana. The University has conferred over 70,000 degrees since the first graduating class of 118 in 1962. UNO has distinguished itself since 1958 and will continue to do so in the future.

According to a recent study by UNO Division of Business and Economic Research, the University of New Orleans has had an immense economic impact on the New Orleans metropolitan area and Louisiana. Two numbers stand out to demonstrate this fact: **$1 billion** is the annual economic impact that UNO has on the state and **13,000** jobs created due to the impact of UNO.

UNIVERSIDAD DEL NORTE

Km.5 via Puerto Colombia
Barranquilla, Colombia
T: (57) (5) 3509509
http://www.uninorte.edu.co

Since its founding in 1966, Northern University has served for over 45 years in the arduous and constant task of serving the Colombian Caribbean region through the provision of higher education with high quality standards. Its training, research and extension have to be considered valid today, one of the top universities in Colombia.

The University of North perceives research as having a substantive role in academia, and therefore is committed to its development and its results to help improve the living conditions of the region and the country, and also with technological advancement and economic development of her environment.

FINCANTIERI CNI SPA

Via Genova, 1
34121 Trieste (Italy)
T:+39 040 3193111
http://www.fincantieri.it

Fincantieri, heir to the great tradition of Italian shipbuilding and one of the largest shipbuilding groups in the world, operates in the design and construction of complex ships with high technological content such as merchant and naval vessels, offshore and mega yachts.

The Company is a leader in the construction of cruise ships and large ferries. Moreover, it is the reference builder for a wide range of ship types including surface vessels (frigates, corvettes, patrol vessels etc.) and submarines.

Fincantieri is a partner to ship owners and to the Defense sector with innovative, tailor-made turn-key products backed by a high service level. The company's wide ranging engineering expertise and capacity to build prototypes enable it to take up new opportunities on the market by developing tailor-made products.

This specific set of skills were proved in January 2013 by the acquisition of STX OSV (today VARD), a company listed on the Singapore Stock Exchange and world leader in the construction of offshore support vessels for oil and gas extraction and production. Thanks to this transaction Fincantieri improved its competitive position in the offshore industry, becoming one of the leading groups in this sector.

In the field of ship repairs and conversions, Fincantieri provides services worldwide and organizes interventions to be carried out at its own facilities or at third party facilities with the aim of reducing the amount of time the ship is out of service and in accordance with customer requirements.

It develops and builds naval systems (stabilizers, solutions and components for propulsion and power generation etc.), industrial turbines, as well as diesel engines, for both marine and industrial application through its subsidiary Isotta Fraschini Motori. The company also draws on its expertise to create complex, high value designs for the luxury niche market of mega yachts of over 70 metres.

KRATOS PUBLIC SAFETY & SECURITY (PSS)

4820 Eastgate Mall, Suite 200

San Diego, CA 92121

T: 866.606

http://www.kratosdefense.com

Kratos Public Safety & Security (PSS) is the nation's second largest independent systems integrator of advanced life safety, security and surveillance systems for government and commercial applications. They design, install and service building technologies that protect people and property and make facilities more comfortable and efficient.

They provide unique solutions in such areas as:

- Access Control
- Building Automation and Control
- Communications
- Digital (IP) and CCTV Security and Surveillance
- Fire and Life Safety
- Maintenance and Service
- Project Support Services

The diversified and stable client base of Kratos, along with strong client relationships, a broad array of contracts, a highly-skilled employee base with possession of government security clearances, and significant management and operational capabilities positions Kratos to become the leading professional services provider for federal government customers.

SEOUL NATIONAL UNIVERSITY

1 Gwanak-ro
Gwanak-gu, Seoul 151-742
***T:** 82-2-880-4447*
http://www.useoul.edu/

Seoul National University honors the ideals of liberal education and aims to teach students a lifelong love of learning that will form the basis for continuous personal growth.

At the same time it is committed to preparing students to work and live in an increasingly competitive global environment. As South Korea's first national university, Seoul National University has a tradition of standing up for democracy and peace on the Korean peninsula.

Graduates have long served as public servants in key positions of the Korean government. In teaching, research, and public service, Seoul National University continues to set the standard of excellence.

The mission of Seoul National University in the twenty-first century is to create a vibrant intellectual community where students and scholars join together in building the future. As Korea's leading research university, Seoul National University is committed to diversifying its student body and faculty, fostering global exchange, and promoting path-breaking research in all fields of knowledge.

UNIVERSITY OF UDINE

Via Palladio 8
33100 Udine
T: +39 0432 556111
http://www.uniud.it/

The University of Udine is a university in the city of Udine, Italy. It was founded in 1978 as part of the reconstruction plan of Friuli after the earthquake in 1976. Its aim was to provide the Friulian community with an independent centre for advanced training in cultural and scientific studies and it's an important centre for the studies of Friulian language.

The University is actively involved in student and staff exchange projects with universities within the European Union,Australia and Canada, and is currently engaged in close collaboration with several universities from Eastern Europe and other non-EU countries. Moreover the University participates in many research projects at national and international level. The present number of students enrolled at the University is approximately 17,000.

CONSTANTA MARITIME UNIVERSITY

Mircea cel Batran Street no.104
Romania, Constanta, cod 900663
T: +40 241 664 740

Constanta Maritime University is a higher education and research institution, an academic community formed by teaching staff, auxiliary teaching staff, students, technical and administrative staff.

Constanta Maritime University bases its activity on the university autonomy, seen as a specific means of self leadership, according to the legal

framework established by the Romanian Constitution and by the Education Law no. 84/1995, reissued in 1999, by other laws as well as by its own regulations.

CMU shares the provisions of The Lima Declaration on Academic Freedom and Autonomy of Institution of Higher Education (1988), The Magna Charta of European Universities (Bologna, 1988) and adheres to the Bologna Declaration (1999).

The executive leadership of the University is ensured by the Rector, assisted by three vice-rectors, a general administration manager and by the secretariat general. The supreme decision forum is the University Senate, formed by 28 members (teaching staff and representatives of the students), which meets in periodic sessions and through permanent commissions for decision making.

UNIVERSITY OF GUILAN

P.O. Box 1841
Rasht, Iran
Tel: (+98) 131- 3232806
http://www.guilan.ac.ir

There are nearly 8000 students in 112 fields of study at the University of Guilan, including undergraduate, postgraduate and research scholars. Spread over four campuses with a total area of more than 2.5 km2, the University has a lively, creative and intimate atmosphere. The University of Guilan originally founded in 1975 and started its academic activities two years later with 120 students in seven departments of Physics, Mathematics, Chemistry, Biology, Agronomy, Animal Husbandry and German Literature.

Today, with more than 350 academic staff, 7 faculties and three research centers, Guilan University is the largest academic institution in northern Iran. There is a wide range of courses offered in the faculties of Science, Engineering, Agriculture, Humanities, Physical Education, Natural Resources, and the Faculty of Art and Architecture. More than 112 courses are on offer in 35 departments, leading to B.Sc., B.Eng., M.Sc., B.A., M.A., and Ph.D. degrees. These courses aim to combine a traditional academic approach with new knowledge, methodology and technology, wherever appropriate. The University's fundamental mission is the advancement and dissemination of knowledge and its understanding. The University of Guilan aims to improve the range and quality of the education it offers, as well as the research activities, and to enhance the environment in which students and staff work. It is committed to reinforcing its reputation as a center of excellence.

Only 30 km away from the Caspian Sea, the University of Guilan is particularly fortunate in its position in the capital city of Guilan Province. Guilan is the territory of forest and rain, rice and silk, bed of roaring rivers and the area of growth of wild violets, primroses, water lilies, and the habitat of swans, ducks and thousands of beautiful plants. An environment where plains, mountains and the sea are touching to create magnificent beauty. A territory full of life and joy with an enchanting nature, which at the same time is a source of dynamism and effort as well as inspiration of tranquility, stimulation of thought and creativity.

UNIVERSIDAD POLITÉCNICA DE CARTAGENA

Pza. del Cronista Isidoro Valverde,
Edif. La Milagrosa
CP. 30202 Cartagena (Murcia)

http://www.upct.es

UPCT is a Spanish academic and public institution, also involved in Research and Development processes.

The technological studies that can be studied in Cartagena, as a result of their long history, are widely considered to be pioneering centres for technological science throughout Spain. Indeed, the School of Industrial Engineering was one of the first to be set up in the country, alongside eight other cities, and the School of Mines was the third pioneering centre to be set up in Spain.

The concept of a "model Centre" was launched and a programming meeting held, chaired by the then Civil Governor of Murcia and attended by the Chancellor of the University of Murcia, the mayor of Cartagena and the principal of the Escuela Universitaria Politécnica (Polytechnic School). In this meeting they agreed on encouraging the development of the future Technical University to be based in Cartagena.

In this sense, it is worth mentioning that the University of Murcia intends to set up a School of Industrial Engineering as a prior step to creating the Technical University of Cartagena. The process evolved through its transition but wasn't passed by the Cabinet. Some years later, the University repeated its request, this time to also incorporate Telecommunication Engineering, Technical Architecture and Technical Agriculture Engineer studies. From the numerous studies that were applied to be granted permission for, the Ministry accepted two: Technical Industrial Engineering, in 1981, and Technical Agriculture Engineering, in 1983, which added to the two already existing specialist degrees.

UNIVERSITÁ DEGLI STUDI ROMA TRE

Via Ostiense, 169
00154 Roma, Italia
T:+39 06 5733 2100
www.uniroma3.it/

Now in its 21st year of academic activity, the Roma Tre "project" has gradually but constantly brought into focus its particular profile; that of a dynamic and efficient seat of learning that, step by step, has become an acknowledged point of reference both in the Italian and the international university system.

Its 40,000 students are the fruit of a winning strategy founded on offering a wide-range of courses and on innovation that focuses on the quality of the teaching and the introduction of the young into the working world.

One of the milestones for Roma Tre, as well as a guideline for its development, was its incorporation in the surrounding area, characterised by the reclamation of old buildings and school premises, transformed into modern facilities for study and research.

In a short time modern and efficient study centres were created, important scientific laboratories were improved, while investment in PhDs and researchers has been steadily increased.

All the faculties have been equipped with a computer laboratory and most of the University is a wireless zone. Piazza Telematica, a computer

centre with 200 multimedia work stations, designed to function as a University Internet point has been set up; linked to all the laboratories, it is an essential tool for facing the new challenges of research and distance learning.

In addition to these teaching facilities our students have at their disposal efficient libraries and sports facilities.

UNIVERSIDAD POLITÉCNICA DE VALENCIA

Camino de Vera, s/n
46022 Valencia
T: (+34) 96 387 70 00
http://www.upv.es

The Polytechnic University of Valencia is a Spanish university located in Valencia, with a focus on science and technology. It was founded in 1968 as the Higher Polytechnic School of Valencia and became a university in 1971, but some of its schools are more than 100 years old.

The UPV is a public, dynamic and innovative institution that is dedicated to researching and teaching. The UPV maintains strong bonds with its social environment and a strong presence abroad.

The University consists of five campuses (Camí de Vera, Blasco Ibáñez, Gandia, Alcoy, and Xátiva) and 14 schools and faculties: Faculty of Business Administration and Management, Faculty of Fine Arts, Higher Polytechnic School of Alcoy, Higher Polytechnic School of Gandia, School of Agricultural Engineering, School of Computer Science, School of Architecture, School of Building Management, School of Civil Engineering, School of Design Engineering, School of Engineering in Geodesy, School of Cartography and Surveying, School of Industrial Engineering, School of Rural Environments and Enology, and School of Telecommunications Engineering. The university offers 48 Bachelor and Master, and 81 Doctoral degrees.

DALIAN MARITIME UNIVERSITY

No.2 Linggong Road,
Ganjingzi District,
Dalian City
Liaoning Province
T: +86-411-84708320 84708304
http://www.dlmu.edu.cn

Dalian Maritime University

Founded in 1909, Dalian Maritime University （DMU） is one of the largest and best maritime universities and is the only key maritime institution under the Ministry of Transport, China. DMU enjoys a high reputation internationally as an excellent center of maritime education and training as recognized by the International Maritime Organization.

DMU has 4 Post-doctoral Research Centers, 6 Primary Discipline Doctoral Programs, 32 Subordinate Discipline Doctoral Programs, 18 Primary Discipline Master's Programs, 64 Subordinate Discipline Master's Programs, and 48 undergraduate programs.

DMU now consists of 19 teaching and research institutions, including Navigation College, Marine Engineering College, Information Science and Technology College, Transportation and Management College, Environmental Science and Engineering College, Transportation Equipments and Ocean Engineering College, Law School, Foreign Languages College, Public Management and Humanities College,

Department of Mathematics, Department of Physics, etc. The current student population has risen to approximately 20000. Up to now, more than 60000 advanced professionals have been educated and trained at DMU, most of which have become the backbone of China's shipping industry.

4. List of documents

Record 1/29
Source: INTERNATIONAL JOURNAL OF PRODUCTION ECONOMICS | 60-1: 251-260 APR 20 1999
Title: Concurrent engineering for global manufacturing
Abstract:
This paper presents the state of the art of the research work carried out within the multi-national collaborative programme IMS-Test Case 3 "Global Concurrent Engineering". The project's aims were to identify the critical constraints with respect to global manufacturing, and to synthesise the best practices of concurrent engineering (CE) in a number of industrial sectors including automotive, aerospace, telecommunication, shipbuilding, and information technology. The consortium was constructed from a cohesive group of world class companies and research institutions from the USA, Canada, and Europe. The research outcome indicated that effective communication; a systematic involvement of customers, suppliers; distributors, powerful information infrastructure, and effective use of modern technology are vital key elements for success. (C) 1999 Elsevier Science B.V. All rights reserved.
Author(s): Abdalla, HS
Organization: De Montfort Univ | De Montfort University | Dept Mech & Mfg Engn
Publication Year: 1999

Record 2/29
Source: 2009 IFIP/IEEE INTERNATIONAL SYMPOSIUM ON INTEGRATED NETWORK MANAGEMENT (IM 2009) VOLS 1 AND 2 | : 732-745 2009
Title: Best Practices for Deploying a CMDB in large-scale Environments
Abstract:
We describe best practices for deploying a Configuration Management Database (CMDB) that we have developed during several recent client engagements. Given the complexity and novelty of CMDB solutions that deal with discovering, storing and tracking actual Configuration Items (CIs), many enterprises rely on service delivery organizations - such as IBM Global Technology Services - to perform the configuration and roll-out of the system into production. This can be either done on the customer premises (within the scope of a so-called project-based service engagement), or by subscribing to a managed service, and thus leveraging the IT service management environment that the service provider has already set up. Often, enterprises severely underestimate the effort involved in setting up IT service management infrastructures by mistakenly equating the setup of such a complex system with the mere installation project of a shrink-wrapped, self-contained product. This, however is not the case: The immense heterogeneity of data center resources makes that no single vendor can cover the breadth of managed resource types when new product versions ship every 12 months, often by means of integrating acquisitions into the product portfolio. Consequently, today's IT Service Management systems rather resemble construction kits and frameworks that require a good deal of tailoring and customization to become useable and useful to the customer. The present paper attempts to provide an insider view into the issues that a CMDB deployment architecture needs to address. In our work, we found that the success of a CMDB deployment project can be attributed to a set of tradeoffs and best practices, especially when it comes to tuning the performance of the system and orchestrating the distributed components of a CMDB so that they work well together. By grounding our work in a concrete case study and by referring to real-life requirements, we demonstrate how to develop an operational architecture by using an off-the-shelf CMDB product. We point out the key design points of our architecture and describe the tradeoffs we had to make, which we subsequently distill into a set of best practices that have been successfully applied in sizing, estimating and implementing subsequent CMDB deployment engagements.

Author(s): Keller, A | Subramanian, S
Organization:
Publication Year: 2009

Record 3/29
Source: RESEARCH IN ENGINEERING DESIGN-THEORY APPLICATIONS AND CONCURRENT ENGINEERING | 6 (1): 14-24 1994
Title: THE USE OF BEST DESIGN PRACTICES - AN ANALYSIS OF US NAVY CONTRACTORS
Abstract:
Rapid and successful introduction of new products is a potentially significant source of competitive advantage for manufacturing firms. Organizations need to identify and manage those critical elements of the product development process (PDP) that have a positive influence on new product success. This research identifies the distinctive product development and design practices, policies and tools currently followed by companies (Navy contractors) that participated in an empirical research study known as the Best Manufacturing Practices Program. A summary of practices reported in the case studies is compiled using content analysis techniques, and the most interesting practices by individual companies are highlighted. We find numerous examples of sophisticated CAD techniques being used to enhance the development process, including expert system design advisers, computer simulation, and design databases. Companies are emphasizing the design policies of concurrent engineering and teamwork, and documenting design process knowledge into design manuals. Company effort still appear focused primarily on the phase of detailed design rather than the concept selection phase.
Author(s): STEVENSON, S | DOOLEY, KJ | ANDERSON, JC
Organization: UNIV MINNESOTA | University of Minnesota System | University of Minnesota Twin Cities
Publication Year: 1994

Record 4/29
Source: TRANSPORT RESEARCH ARENA 2012 | 48: 95-105 2012
Title: Concurrent treatment of safety aspects in ship design and construction process
Abstract:
This paper presents a fascinating overview of many concurrent topics having Ship Safety as common denominator. It is a voyage in the recently explored waters of innovation - promoting dissemination of R&D fmdings, best practices and application techniques successfully implemented by the European Shipbuilding industry - as well as a continuation of the adventure towards uncharted waters of future challenges. From the perspective of the European Shipyards, insight is given into the work in progress on direct assessment of safety and the possible implications on the future regulatory framework. Every year, safety regulations are modified and updated to keep the pace with new technologies and developments in the maritime industry. There is an impressive range of topics marking the evolution of safety aspects in ship design, including, but not limited to: Safe Return to Port, Formal Safety Assessment, Goal-based / Performance-based design, new generation Intact Stability Criteria, Probabilistic Damage Stability implementation, Water on Deck, Collision and Grounding, Time to Flood / Sink / Capsize, Evacuation Analysis, Alternative Design, Innovative Life-Saving Equipment, Navigation and Bridge Equipment, Fire prevention, Accident prevention. Such design and operation developments have been promoted and implemented with the valuable support and contribution of a number of EC-funded projects. Each of these projects somehow paved the way to specific innovation, or offered answers to the primary challenges of the European maritime industry. (C) 2012 Published by Elsevier Ltd. Selection and/or peer review under responsibility of the Programme Committee of the Transport Research Arena 2012
Author(s): Maccari, A
Organization: Fincantieri CNI SpA
Publication Year: 2012

Record 5/29
Source: AUTOTESTCON 2000: IEEE SYSTEMS READINESS TECHNOLOGY CONFERENCE, PROCEEDINGS | : 154-159 2000
Title: The Raytheon Missile Systems Test Systems Development Process
Abstract:
This document describes the Raytheon Missile Systems' Test Systems Development Process, which is a formal, step-by-step process, utilized by Raytheon Missile Systems to develop Test Equipment Systems for its products. The process represents a flow-down and tailoring of the Company's Integrated Product Development Process and Las been recognized as an Industry Best Practice by the Navy's Center of Excellence for Best Manufacturing Practices. It is available and updated on-line, ria an internal Company Web-site.
Author(s): Lytle, RJ | Spires, SB
Organization: Raytheon Co
Publication Year: 2000

Record 6/29
Source: Proceedings of the ASME Turbo Expo 2005, Vol 5 | : 595-603 2005
Title: Developing and deploying icas-capable cbm software modules - Best practices and lessons learned
Abstract:
The U.S. Navy's Integrated Condition Assessment System (ICAS) is a shipboard monitoring system that helps enable the Navy's Condition Based Maintenance (CBM) initiative. ICAS is installed on a large number of Navy Surface Combatants and provides data acquisition, display, and logging, as well as equipment diagnostic analysis for troubleshooting and maintenance tasking of hull mechanical and electrical systems. In recent years, it has been desirable to integrate specialized, third party diagnostic or prognostic software as plug 'n play modules within the ICAS environment. A specific effort focused on such modules for shipboard LM2500 and Allison 501 K gas turbine engines is well underway. Over the course of this three-year Prognostic Enhancement to Diagnostic System (PEDS) program, many lessons have been learned, best practices for ICAS integration have been identified, and the important steps required to field ICAS-capable modules have been realized. This caper summarizes these lessons and processes for future 31 party integration efforts and provides specific examples for the developed gas turbine modules. The successful deployment of these modules aboard Navy ships is used to validate the ideas presented.
Author(s): Watson, MJ | Byington, CS | Donovan, B | Kacprzynski, G | Krichene, A | Savage, C
Organization: Impact Technol LLC
Publication Year: 2005

Record 7/29
Source: 2012 TENTH INTERNATIONAL CONFERENCE ON ICT AND KNOWLEDGE ENGINEERING | : 25-30 2012
Title: Model Based on Knowledge Management for Intensive Organizations Naval Engineering Application: Colombian Naval Sector
Abstract:
This article presents a process R&D, allowing structure, develop and integrate a management model based on knowledge from the joint three fundamental pillars: the technology management, talent management, human knowledge management and structural support of technologies information and knowledge, the application of the model is able to consolidate in COTECMAR, a Science and

Technology Corporation belonging to the naval sector Colombia. Within the development of research were taken as the theoretical basis organizational learning, skills management of human talent, the models of knowledge management, technological monitoring, infrastructure knowledge, business intelligence, technology transfer and own processes of innovation and development of shipbuilding industry in design, construction and repair of ships and craft. The challenge laid out by research team was associated with the development of policies, strategies, methodologies and tools to manage knowledge, developing skills and competencies from individual experiences, group and organizational, so that short-term fostered a culture of generation innovation for competitive and comparative advantages in the sector naval. Additionally as part of the R & D. He designed a Web platform as a tool for developing knowledge management tasks, in this case communities of practice, virtual communities and knowledge networks, which is active in the organization.
Author(s): Wilson, NB | Carmenza, LA | Luis, RRJ
Organization: Univ Norte | University of Del Norte | Dpto Ing Sistemas
Publication Year: 2012

Record 8/29
Source: GLOBAL ENGINEERING AND MANUFACTURING IN ENTERPRISE NETWORKS: GLOBEMEN | 224: 313-336 2002
Title: Document-based knowledge management in global engineering and manufacturing projects
Abstract:
The core competence of a global engineering and manufacturing enterprise increasingly depends on the quality of its intellectual resources and how these resources are used. This paper presents an approach to document-based knowledge management in a typical global engineering and manufacturing application, the ANZAC Ship Project.
Author(s): Hall, WP | Jones, M | Zhou, MW | Anticev, J | Zheng, J | Mo, J | Nemes, L
Organization:
Publication Year: 2002

Record 9/29
Source: International Conference on Management Innovation, Vols 1 and 2 | : 356-360 2007
Title: Models of knowledge management of shipbuilding virtual enterprise based on web service
Abstract:
This paper first points out that virtual enterprise is the main way of realize agile manufacturing and analyses the importance of knowledge management to virtual enterprise, then puts forward the prerequisite to structure virtual enterprise oriented towards shipbuilding based on the present situation of shipbuilding of china, analyses the knowledge management connotation of shipbuilding virtual enterprise, studies the domain models based on UML and system platform model based on web service, the knowledge resources of shipbuilding enterprises is shared and used through the platform, the cooperation with each other being strengthened in order to good at repartee of global market competition of shipping market.
Author(s): Wang, ZY | Tang, HY
Organization: Jiangsu Univ Sci & Technol | Jiangsu University | Inst Econ & Management
Publication Year: 2007

Record 10/29
Source: Managing Knowledge with Technology | : 42-62 2004
Title: Generating fleet support knowledge from data and information
Abstract:
Knowledge management systems need to aggregate and assimilate data and information from a variety of sources. For example, Tenix Defence must track the statuses and structures of the ANZAC Class frigates it builds for the Australian and New Zealand Navies. Effective management of the engineering and fabrication processes requires validating, aggregating and assimilating hundreds of thousands of data records from some 15 separately maintained engineering databases holding partial or specialized views of each of the 10 ships or their components. Tenix developed a generic solution called Crossbow to integrate data from disparate databases into a single coherently integrated dataset. Prior to integration, Crossbow automatically checks and validates data against more than 500 business rules; reporting errors and inconsistencies to relevant data owners via e-mail. Crossbow also provides powerful search, navigation, display and reporting functions able to provide easily customizable ad hoc views of current or historical data. The system is used by Tenix staff around Australia to provide coherent views of work in progress or completed ships, and is being extended to provide Naval personnel with similar views of ships in service. Crossbow is also being trialled in a range of non-manufacturing uses, e.g., airlines, health care, and law enforcement.
Author(s): Sykes, M | Hall, W
Organization: Monash Univ | Monash University | Knowledge Management Lab | ANZAC Ship Project | Tenix Defence
Publication Year: 2004

Record 11/29
Source: INTERNATIONAL JOURNAL OF PRODUCTION RESEARCH | 47 (7): 1857-1876 2009
Title: Depreciation and transfer of knowledge: an empirical exploration of a shipbuilding process
Abstract:
It is well known from the psychological literature that knowledge acquisition (learning) and knowledge depreciation (unlearning) are governed by quite different rules. We propose a new learning curve model that measures acquisition of knowledge and depreciation in a single framework but governed by two different rules. The model considers that knowledge is acquired both by doing and from the experience of others. It also assumes that knowledge depreciates, if it does, continuously over time. We empirically demonstrate the applicability of our model using a dataset based on the construction of homogeneous ships in sixteen different shipways of a shipyard. It is observed that learning by doing (or direct learning) is the major source of productivity growth. Learning from others (or indirect learning) is also found to be sizable. The potential contribution to productivity of indirect learning is about 40% of the contribution of direct learning. It is also observed that knowledge indeed depreciates and it does so rapidly. Only about three quarters of knowledge available at the beginning of a month would remain by the end of the month due to forgetting. Therefore, if depreciation of knowledge or indirect learning (the transfer of knowledge) in a learning curve analysis is ignored, estimation of production rates and costs would be seriously biased.
Author(s): Kim, I | Seo, HL
Organization: Western Washington Univ | Western Washington University | Headquarters Republ Korea Air Force | Coll Business & Econ
Publication Year: 2009

Record 12/29
Source: JOURNAL OF WORLD BUSINESS | 35 (1): 1-20 SPR 2000
Title: An unconventional approach to intellectual property protection: The case of an Australian firm transferring shipbuilding technologies to China
Abstract:
Risks associated with the dissipation of intellectual property rights of foreign firms transferring technology to China have received some attention in the academic and professional, trade-based literature. An innovative Australian manufacturer and designer of large, high-speed catamaran ferries (INCAT) recently entered into a joint venture with a Hong Kong-based partner (AFAI) to manufacture ferries in China, without any formal, institutional protection of its proprietary knowledge. Key findings uncovered through an in-depth analysis of this case include the identification of novel bundles of firm-specific resources and capabilities that sustain a firm's intellectual property and, ultimately, its competitive advantage in the face of dissipation risks, and a combinative competency of the firm in creating these bundles. This study illustrates a case in which the conventional means of protecting intellectual property need not always be followed to best ensure the firm's retaining its competitive positioning in foreign markets.
Author(s): McGaughey, SL | Liesch, PW | Poulson, D
Organization: Univ New S Wales | University of New South Wales | Univ Queensland | University of Queensland | Univ Tasmania | University of Tasmania | Sch Int Business | Grad Sch Management | Sch Management
Publication Year: 2000

Record 13/29
Source: INTERNATIONAL JOURNAL OF NAVAL ARCHITECTURE AND OCEAN ENGINEERING | 3 (3): 181-192 SEP 2011
Title: Research on systematization and advancement of shipbuilding production management for flexible and agile response for high value offshore platform
Abstract:
Recently, the speed of change related with enterprise management is getting faster than ever owing to the competition among companies, technique diffusion, shortening of product lifecycle, excessive supply of market. For the example, the compliance condition (such as delivery date, product quality, etc.) from the ship owner is getting complicated and the needs for the new product such as FPSO, FSRU are coming to fore. This paradigm shift emphasize the rapid response rather than the competitive price, flexibility and agility rather than effective and optimal perspective for the domestic shipbuilding company. So, domestic shipbuilding companies have to secure agile and flexible ship production environment that could respond change of market and requirements of customers in order to continue a competitive edge in the world market. In this paper, I'm going to define a standard shipbuilding production management system by investigating the environment of domestic major shipbuilding companies. Also, I'm going to propose a unified ship production management and system for the operation of unified management through detail analysis of the activities and the data flow of ship production management. And, the system functions for the strategic approach of ship production management are investigated through the business administration tools such as performance pyramid, VDT and BSC. Lastly, the research of applying strategic KPI to the digital shipyard as virtual execution platform is conducted.
Author(s): Song, YJ | Woo, JH | Shin, JG
Organization: Seoul Natl Univ | Seoul National University | Dept Naval Architect & Ocean Engn
Publication Year: 2011

Record 14/29
Source: INTERNATIONAL JOURNAL OF PRODUCTION ECONOMICS | 131 (2): 545-560 JUN 2011
Title: Using value analysis to support knowledge transfer in the multi-project setting
Abstract:
This paper investigates how formalized methodologies can effectively support the implementation of knowledge transfer practices in the multi-project setting. We propose a knowledge collection and transfer model grounded on the Value Analysis technique, empirically developed and validated through an action research in the shipbuilding industry. The proposed model facilitates decision making across multiple projects in the cruise ship design by stimulating the reuse of the available knowledge base and the exploitation of information needed to identify design solutions to solve the trade-off between functional requirements and available resources. (C) 2011 Elsevier B.V. All rights reserved.
Author(s): Formentini, M | Romano, P
Organization: Univ Udine | University of Udine | Dept Elect Managerial & Mech Engn DIEGM
Publication Year: 2011

Record 15/29
Source: ELECTRONIC LIBRARY | 18 (6): 392-402 2000
Title: Enterprise knowledge portals: two projects in the United States Department of the Navy
Abstract:
Two projects in the US Department of the Navy to develop enterprise portals for facilitating knowledge discovery and dissemination are discussed. The authors describe efforts within a global organization to capitalize on current knowledge management concepts and technologies for knowledge access and sharing in order to provide users with more personalized, responsive, and integrated information systems. The Next Generation Library supports knowledge management and networking objectives, as well as providing high-quality content access at the desktop. The Naval Postgraduate School Knowledge Portal, still under development, is designed to link internal administrative databases with current message traffic and external scholarly information resources.
Author(s): Reneker, MH | Buntzen, JL
Organization: Naval Postgrad Sch | USN | United States Navy | United States Department of Defense | Dudly Knox Lib | Off Dept Navy Chief Informat Officer
Publication Year: 2000

Record 16/29
Source: Proceedings of the Sixth International Conference on Information and Management Sciences | 6: 190-195 2007
Title: Knowledge management on weld joint object in engineering design support
Abstract:
Consideration on product design is remarkably increasing in manufacturing design and how to improve the intelligent productivity in engineering design business has become a pressing need for enterprises. Especially in the field of welding vessel design, it is not only to concern with the geometric information like drawing in design, more important thing to be considered for a designer is to treat with the engineering design knowledge. But the general-purposed CAD systems do not treat it efficiently. Thus, there has been a considerable growth of interest in knowledge-based design support systems for engineering design. We have proposed an assembly structure model for welding design object. This paper focus the discussion on modeling and representation of weld joint, and the management of the public design knowledge based on the proposed model.
Author(s): Zhang, ZH
Organization:
Publication Year: 2007

Record 17/29
Source: DYNA | 86 (6): 699-706 DEC 2011
Title: Improving product development from a knowledge management based approach. The case of Navantia
Abstract:
Introduction: To achieve competitive advantage, a company must permanently innovate and change its products, process and management systems faster than competiors. In manufacturing companies, as new products become the focus in competition, the new product development (NPD) process become increasingly important to these businesses. NPD process can be improved by boosting product lifecycle knowledge management. In this paper, how to carry out this improvement is described through a case study of a naval shipbuilding firm, Navantia. Methods: In the detailed case study, the improvement needs are identified from a knowledge management based approach and the solutions developed are described. These solutions are provided by a Product Lifecycle Management (PM) system by means of its tools and its integration with other management systems used in Navantia. Results: The integration of knowledge in the company has lead to access and sharing information time reduction; errors reduction; improvement in the communication among employees and with partners, customers and suppliers; and design time and product costs reduction. Discussion: This case provides several keys to a successful implementation of a PLM system, such as making a reasoned analysis of the needs of the company from a strategic knowledge management based approach, the gradual integraton of existing tools with the system PLM and the involvement of different actors in the company, both at organizational and interorganizational level.
Author(s): Martinez-Caro, E | Campuzano-Bolarin, F | Villaescusa-Chocano, JA
Organization: Univ Politecn Cartagena | Universidad Politecnica de Cartagena | Univ Politecn Valencia | Polytechnic University of Valencia | Escuela Tecn Super Ingn Ind
Publication Year: 2011

Record 18/29
Source: PROCEEDINGS OF THE 4TH INTERNATIONAL CONFERENCE ON BUSINESS EXCELLENCE, VOL 2 | : 255-258 2009
Title: FLEXIBLE SYSTEMS AND A NEW LINK OF PRODUCTION IN THE CONDITIONS OF A MANAGEMENT BASED ON KNOWLEDGE
Abstract:
In this work I proposed myself to treat a series of aspects connected to the importance of management based on knowledge and the implications this has over the flexible systems and implicitly over the new link of production. I have shown which the traits of the management based on knowledge are and I have distinguished the new tendencies in the managerial practice. The enterprise remains competitive only if it had solved its own creative intelligence and it disposes, for this one, of a corresponding management of knowledge. In these conditions, the organizations are put in the situation of redefining their own culture through processes of organizational reprojection and changes of strategy. I have characterized the more representative flexible systems, such as: the management of the total quality and the method "just in time", total concepts which bring the firms close to the work of elite. I have also emphasized the importance of using the concept of "co-maker-ship" in practice, for a new relation client - manufacturer.
Author(s): Todorut, AV
Organization: Constantin Brancusi Univ
Publication Year: 2009

Record 19/29
Source: PROCEEDINGS OF THE 7TH INTERNATIONAL CONFERENCE ON INTELLECTUAL CAPITAL, KNOWLEDGE MANAGEMENT AND ORGANISATIONAL LEARNING | : 331-340 2010
Title: The Choice of Intellectual Capital Statements in Systems Integration in a Leading High-Tech Company
Abstract:
Today, many organizations recognize the importance of intellectual capital models as a principal driver of firm performance and as a core differentiator. An increasing number of firms begin reporting more about the intangible aspects of their business even without the force of regulations. Human capital is the core of the IC model. In the knowledge-based economy, this is becoming the most important intangible asset for most organizations. Key value drivers for human capital are employee knowledge, skills, abilities, innovativeness and experience. The key is to capture that knowledge within the company's structures, transferring it from individuals, to groups, to the entire organization and such that it becomes part of the organization's "structural" capital and enhances the ability to build relationships with customers and all stakeholders. The purpose of this paper is to present the results of an empirical study into the critical success factors for implementing the development of intellectual capital statements in relation to knowledge-management activity. In fact, the IC statement is a new form of reporting the aim of which should be to capture the firm's KM activities (Mouritsen, 1998; Mouritsen, Larsen and Bukh 2001) in order to improve managerial decision process and the evaluation of the firm by financial analysts and external stakeholders. The research is qualitative and focused on a case study. In general terms, the case method (Yin, 1994) has the dual aim of detailing the principal characteristics of the phenomena and understanding the dynamics of a given process. The company analyzed designs and develops Large Systems for Homeland Protection - systems and radar for air defence, battlefield management, naval warfare, air traffic control, coastal and maritime surveillance. The company with about 4,200 employees has fifty years of experience in systems integration and a customer base in no less than 150 countries. The firm is a leader in research and development thanks to annual investments amounting to 20% of the production value. One of the company's top management new challenge is to define a method to visualize, measure and manage the firm's intellectual capital. Thus our research question is how to draw up a "useful" instead of a "fashionable" corporate IC statement. As a first step we suggest it is important to ask "why", "what", "how" and "when" to implement it. Consequently our empirical study aims at answering these questions.
Author(s): Paoloni, M | Paoloni, P | Demartini, P | Guidotti, M | Celli, M
Organization: Univ Roma Tre | Roma Tre University
Publication Year: 2010

Record 20/29
Source: Proceedings of 2005 International Conference on Construction & Real Estate Management, Vols 1 and 2 | : 843-846 2005
Title: Research on shipbuilding industry group and its knowledge union and transfer in Yangtze River Delta
Abstract:
With the challenge of the global economy integration. Chinese factories are affronting a changeful and uncertain market environment. It is a problem needs to be urgently researched that how Chinese factories can shape industry groups with regional innovation superiority and how they can use the knowledge union to compete and develop their predominance. Systematically using the concepts and theories of the knowledge union, transfer, diffusing and management, this paper researches the mechanism of the industry group. It deduced that regional economy's persistent development must base on the internal force and the competition environment through researching on the effect factor, arrangement and benefits of the knowledge transferring in the knowledge union of industry group. Taking shipbuilding industry group in Delta of Yangtze River as a example, this paper analyzes the

development mechanism of it, and discusses the current problem and challenge, and propose the idea how to develop shipbuilding industry group in Delta of Yangtze River.
Author(s): Wu, J | Liu, SF
Organization: Nanjing Univ Aeronaut & Astronaut | Nanjing University of Aeronautics & Astronautics
Publication Year: 2005

Record 21/29
Source: INTERNATIONAL JOURNAL OF TECHNOLOGY MANAGEMENT | 26 (7): 767-787 2003
Title: Leadership, learning and resources for the high-tech firm: an integrated view of technology management
Abstract:
Technology management study programs typically comprise various scientific disciplines: management, economics, marketing, engineering, innovation management and social sciences. The practising manager who wants to improve the chances of success of his organisation is faced with a large body of disconnected scientific knowledge he must somehow collect and integrate. This article, based on existing literature and illustrated by industry examples, offers two simple models to understand the contributions and various inter-relationships between the technology management concepts underlying the management of a high-tech organisation. The Corporate Ship analogy illustrates the dynamic nature of strategy making and the need to reconcile the pursuit of short-teen opportunity with long-term objectives in turbulent high-technology environments. The Corporate Diamond model uncovers the strong inter-relationships between key concepts in technology management: leadership, learning, managing resources and developing successful new products and services. N.B. Use of the masculine form throughout the text is intended also to encompass the feminine.
Author(s): Couillard, D | Lapierre, J
Organization: Harris Corp | Ecole Polytech | Polytechnique Montreal | University of Montreal | Microwave Commun Div | Math & Ind Engn Dept
Publication Year: 2003

Record 22/29
Source: Proceedings of the 2006 International Conference on Management Science & Engineering (13th), Vols 1-3 | : 1327-1332 2006
Title: KM-based project team of CoPS in manufacture industry
Abstract:
Complex Product System (CoPS) plays an important role in an organization, zone economy, and country economy. As prime part of CoPS, CoPS in manufacture industry is having more and more powerful effect to an organization's success and a country's economy. However, Inherent characters of CoPS in manufacture industry, e.g. multi-discipline technology integration of product, cross-organization in management, and high risks, cause management of CoPS in manufacture industry confronting many problems. The root of above problems lies in the complex knowledge trait of CoPS in manufacture industry. A project management team whose structure is suitable for knowledge management (KM) can be useful for solving above problems. This paper aims to check the effectiveness of KM in CoPS in manufacture industry, and further check what kind of team structure is suitable to KM tasks in order to solve the problems met with by CoPS in manufacture industry. Through analysis of one typical case in large new shipbuilding, it is found that KM should be an important function in CoPS in manufacture industry. A dynamic cross-organization multi-layer project team is proposed; this dynamic project team structure fits for KM than both the matrix organization's structure and the project-based organization's structure in the management of CoPS in manufacture industry. This research can be used to guide the management practice of CoPS in manufacture industry, and also can facilitate further studies on KM in project environments of CoPS in manufacture

industry. This essay is divided into three main parts: Firstly, characters, product processes', and management problems of CoPS in manufacture industry are given, and studies about KM are reviewed; secondly, one typical case about large new shipbuilding is analyzed. Finally, a KM-based project team called "dynamic, cross-organization, multi-layer project team" is proposed.
Author(s): Chen, ZD
Organization: Dalian Univ Technol | Dalian University of Technology | Sch Management
Publication Year: 2006

Record 23/29
Source: JOURNAL OF COMPUTER INFORMATION SYSTEMS | 42 (5): 1-6 Sp. Iss. SI 2002
Title: Facilitating innovation through knowledge sharing: A look at the US Naval Surface Warfare Center-Carderock Division
Abstract:
One of the key reasons for engaging in knowledge management is to stimulate innovation in organizations. This would hopefully lead to new products and services in the e-business age. Through knowledge management, a knowledge sharing culture will emerge to foster better collaboration and communication through communities of practice. This paper looks at knowledge sharing techniques and metrics for facilitating innovation and then discusses an organization, the US Naval Surface Warfare Center, pondering the use of these techniques. An approach for knowledge sharing selection is then discussed in context with this organization.
Author(s): Liebowitz, J
Organization: Univ Maryland Baltimore Cty | University of Maryland Baltimore County
Publication Year: 2002

Record 24/29
Source: NAVAL ENGINEERS JOURNAL | 124 (4): 101-109 DEC 2012
Title: The Application of Knowledge Management in Early-Stage Warship Design
Abstract:
During early design stages a design team will investigate a variety of ship concepts, and the customer will use these concepts to elucidate a set of requirements and make decisions. To accomplish early stage design, designers use two types of knowledge: technical (engineering) knowledge, and programmatic (Naval Ship Acquisition Process) knowledge. The nature of technical knowledge is well known, but programmatic knowledge may require definition. Programmatic knowledge is the knowledge of the naval design and acquisition system that determines what would actually come out of the acquisition pipeline, with a given concept design as the input. The author's research has identified two areas where the tools of Knowledge Management could benefit the early stage design process. The first of these is a Decision Support System that would capture historical data on the evolutions suffered by previous ship designs, and package this data in a form usable to the concept design engineer. The second recommendation of this project is the creation of an electronic Community of Practice for the concept design community.
Author(s): McKesson, CB
Organization: Univ New Orleans | University of New Orleans | Sch Naval Architecture & Marine Engn
Publication Year: 2012

Record 25/29
Source: PROCEEDINGS OF THE 12TH EUROPEAN CONFERENCE ON KNOWLEDGE MANAGEMENT, VOLS 1 AND 2 | : 668-675 2011
Title: Knowledge Mapping Based on EFQM Excellence Model: A Practical Tool to Make Visible Organizational Knowledge

Abstract:
As organizations strive to improve their business performance and capacity for innovation, their attention is increasingly focused on how they manage knowledge. This is a reason why Utilizing organizational knowledge is a strategic weapon to acquire a competitive advantage. In knowledge management (KM) processes, Representing and capturing Knowledge is an important constituent. One tool to represent and make knowledge visible throughout the organizations is knowledge mapping. Knowledge mapping plays an important role in the construction, learning, and dissemination of knowledge. KM is most effective when it is approached holistically. This is achieved through a series of integrated initiatives aligning human resource issues, ICT infrastructures and informal learning interventions that enable the organization to improve the quality of the knowledge it holds, enhance access to and the retrieval of the knowledge. European Foundation for Quality Management excellence (EFQM) model could be considered as an interface to integrate KM. EFQM excellence model is an appropriate assessment tool for organization to identify which sectors have strengths and which has weaknesses. To do so, model provides some criteria and sub criteria in two main sections: enablers and results. In order to achieve bullet points in EFQM model, organization require a set of skills and knowledge in the organization. Exploitation of proper knowledge maps supports the organization to classify these knowledge and skills. This paper proposes a practical framework to capture and represent organizational knowledge in a holistic approach based on EFQM enablers. In order to achieve this aim, paper focus on enablers components. Subsequently by exploring these enablers in a systematic view, knowledge maps were developed for enablers. Proposed framework is subject to implement in a real case in shipyard industries to provide practical evidences. Following the illustration of knowledge maps role in KM process, paper proceeds by analyzing different knowledge maps. After a brief review of EFQM model and the role on knowledge maps in this model, the appropriate map will be selected to map organizational knowledge based on bullet points in EFQM model. Finally lessons learned from industrial case study will discuss.
Author(s): Moradi, M | Ramazanian, MR | Momeni, SM
Organization: Univ Guilan | Dept Management
Publication Year: 2011

Record 26/29
Source: MANAGEMENT OF TECHNOLOGICAL CHANGES, BOOK 2 | : 457-460 2011
Title: MARITIME TRAINING BASED ON INNOVATION AND KNOWLEDGE
Abstract:
It is well known the fact that Maritime Education and Training (MET) represents an expensive system due to the fact that it requires rather high investments. In order to ensure a high-level education, MET requires costly equipment, such as simulators and training ships and that means huge sums of money. It is easy to conclude that not all institutions can offer high-quality MET especially because Maritime Education is more expensive than it should be. Training for seafarers has evolved rapidly to include a whole range of approaches and techniques. In particular, reliance on traditional face-to-face and on-the-job training has changed, giving way to the increased use of even more advanced and realistic simulators and other forms of computer-based training. There is every indication that the management of shipboard systems will become even more advanced and integrated in the years to come and training will have to keep up with that progress. The shipping industry needs to recruit high quality seafarers and train them to high standards to reflect the changing nature of shipboard operations and demands for officers to possess a wider range of skills. This means that the price of cutting back on investment in training will be even greater than it was in the past. Hence, knowledge is becoming more and more specialized and a highly educated workforce is paramount for continuous economic growth in developed countries, especially in MET Indeed, there is an increased awareness of the importance of change in maritime business management, in economic growth theory and in development thinking. This reflects the increasing complexity in processes, products and services

maritime business experiences. We note that efficient knowledge transfer in MET is facilitated by three factors: improved understanding as a result of a continuous communication, the existence of common references and competences and complementary knowledge bases motivating exchange. Technology, innovation and knowledge are the central factors contributing to economic growth. Innovation happens in a dynamic interaction between actors, like the shipping industry. Furthermore knowledge is not seen as a public good that is freely available for everyone; rather knowledge can be local and tacit. Therefore, knowledge could be the change that could be applied in order to obtain a high quality in MET We observe that the use of the Internet in the setting for this study poses some challenges related to those factors. When interaction does not happen face to face but through a technological interface, it might be more difficult to establish a broad basis for communication as the spectre and interactivity in the communication is somewhat reduced. Where cooperation happens across cultures and between actors in countries with different levels of development (this happens onboard a merchant ship where the crew members have different nationalities and cultures), common references and competences might be scarcer. On the other hand, there is a greater chance that complementary knowledge bases exist and this can give a motivation for knowledge transfer to happen. These observations will be useful when investigating cooperation taking place between researchers.
Author(s): Varsami, A | Popescu, C | Batranca, G
Organization: Constanta Maritime Univ
Publication Year: 2011

Record 27/29
Source: NUCLEAR ENGINEERING AND DESIGN | 251: 369-373 Sp. Iss. SI OCT 2012
Title: RAPHAEL: Developing major V/HTR technology
Abstract:
The FP6 RAPHAEL Integrated Project on V/HTR technology concluded in April 2010 after 5 years of successful performance. 35 partners from 10 Member States, an overall budget above 18 MEUR and about 170 key deliverables are some important figures of the project. RAPHAEL provides results in seven V/HTR technology areas: core physics, fuel, fuel cycle back end, materials, components, safety and system integration covering the major systems and components of a V/HTR. Major highlights include design, fabrication and testing of innovative helium components, improved fuel fabrication and fuel and materials irradiation, and safety testing and PIE of irradiated fuel. In the area of coupled reactor physics and core thermo fluid dynamics, benchmarks have been performed on core safety experiments on the AVR and HTR10 high temperature test reactors, and on the HFR EU1 bis fuel burn-up experiment. The fuel cycle back-end activities cover characterisation of V/HTR-specific waste, disposal behaviour and conditioning and spent fuel performance modelling. The materials activities comprise vessel and high-temperature materials, the latter work in collaboration with EXTREMAT. and graphite irradiation and characterisation. Safety and licensing assessments of a V/HTR, and the system integration aspects with respect to plant reference data and R&D results complete the comprehensive scope of RAPHAEL. Selected results will be made available as Euratom input for exchange within the GIF VHTR projects in negotiated procedures. Two advisory groups (safety-SAG and industrial users-IUAG) accompanied the project and provided valuable input regarding adjustment of concept specifications. The recommendations of the Industrial Users Advisory Group, including major end-users, are used as input to EUROPAIRS, an FP7 support action aiming at integrating end-users into the R&D process towards a demonstrator for cogeneration. To address the key issue of knowledge transfer, RAPHAEL conducted three Eurocourses, with support of the IAEA, to transmit V/HTR physics and technology to young engineers and students. Furthermore, RAPHAEL was regularly present in conferences and has issued numerous technical publications. RAPHAEL executed intensive international collaboration mainly in the areas of materials and fuel, in particular with Korea. and in safety. In addition, its representation and contribution was often requested in collaboration initiatives

of Euratom with Russia and China, and in workshops organised by IAEA.
Author(s): Bogusch, E
Organization: AREVA NP GmbH
Publication Year: 2012

Record 28/29
Source: 2012 IEEE INTERNATIONAL CONFERENCE ON TECHNOLOGIES FOR HOMELAND SECURITY | : 260-265 2012
Title: An Overview of Maritime and Port Security
Abstract:
There has been a growing need to increase maritime and port security in recent years while allowing for the free movement of people and commerce through these facilities. This enhanced security needs to be implemented both landside and waterside and may pose a significant challenge for operations and security personnel. The International Ship and Port Facility Security (ISPS) Code was created by the International Maritime Organization (IMO) to define minimum associated responsibilities for shipping companies, ship personnel, port operators, and associated agencies. There are a number of commercial off the shelf technology components that have been used to provide or enhance security at maritime facilities. In this paper, we will discuss the implementation of the aforementioned government programs and the deployment of port security systems using commercial off the shelf (COTS) products and their integration with command and control platforms. Best practices and what has been done at a number of generic facilities across the U. S. will also be discussed.
Author(s): Peckham, C
Organization: Kratos Publ Safety & Secur Solut Inc
Publication Year: 2012

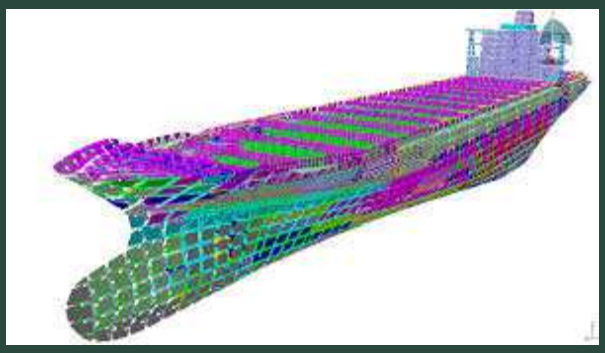
Record 29/29
Source: TECHNOLOGY TRANSFER IN A GLOBAL COMMUNITY | 28: 767-771 1996
Title: SpecRite - A Program Manager's WorkStation (PMWS) tool for assisting in the development of performance specifications
Abstract:
SpecRite is a performance specification generator developed by the Navy's Best Manufacturing Practices (BMP) Program. The latest electronic tool in the BMP's Program Manager's WorkStation, SpecRite assists users in creating functional specifications. The resulting specifications are fully compatible with commercial applications while also compliant with the MIL-STD-961D format. This paper describes the engineering focus as well as the open architecture used to develop SpecRite. The resultant tool is easy to use and tailor to specific applications. A menu based process to assist the user is described. Additionally, as further improvements are introduced to SpecRite, this knowledge-based tool will effectively support those developing specifications while promoting best practices in technology, design, test, and production.
Author(s): Willoughby, B
Organization:
Publication Year: 1996

5. Disclaimer

International Patent Classification is made according to objective criteria. However, the interpretation of these documents always involves a degree of subjectivity, due to the fact that the classification is made by different examiners, from different technical sectors and countries of origin (and, therefore, different languages), and therefore that leaves certain limits to subjectivity and interpretation of some concepts. Therefore, it should always keep in mind that we have to accept a margin of error.

During the investigations, the only files (either patents or utility models) that can be detected are those that have already been published. In Spain (as in most countries), the utility model applications are not published until at least 6 months from the date of application, and patents to a minimum of 18 months from the date of application. Therefore, the utility model applications filed in the last 6 months and the patent of the last 18 months are not "detected" during investigations. In some countries, patent applications are not published until they are granted, so that in such cases, the period during which they are not detectable is 2-3 years or more. In other countries such as Italy (and some Latin American countries), there is an enormous delay in the Patent Office and this process could take several years. Either way, it should be noted that patent applications are not published, in most cases, even after 18 months from the filing date or priority date (if claimed).

On the other hand, it is desirable to indicate that many companies do not apply for patents and / or utility models using their name, but using other companies or individuals to make the applications.



Best practices in operations during production and exploitation processes

TECHNOLOGY SURVEILLANCE REPORT