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This issue of the RECENT® journal is dedicated to the 13th INTERNATIONAL CONFERENCE STANDARDIZATION, PROTOTYPES AND QUALITY: A MEANS OF BALKAN COUNTRIES' COLLABORATION. Selection and evaluation of published papers was provided by the Conference Organizing Committee.

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- [Hamzah Salman AL-MAMOORI](#)

The Issue of Standardization in Tradition Urban Fabric of Islamic City

» Abstract

Many studies concern with Islamic city and its urban fabric through several approaches, like figuration, identity, and its structure. There is epistemological shortage through the role of standardization in urban fabric of Islamic cities. The research concerns of many conceptions affect many standards that govern that urban fabric and its figuration. The problem is determined according to the ambiguity of those conceptions, their origin and the way of effectiveness in standards of Islamic city urban fabric. The importance of the research appears through the way of determining the genotypes of basic conceptions that determine the form of Islamic city urban fabric. The research scope is to enrich the basic base of how to deal with tradition analyzing and how to determine the privacy of Islamic city through depending Islam Shari'ah. Quran and Sunnah are basic sources of Shari'ah. The research hypothesis appeared through the role of deep conceptions that affect many standards that govern urban fabric figuration. Analytical methodology was built to reach many conceptions and indicators like directive, unity, spatial flow, compactness, abstraction, public and private. All these indicators of many values affect tradition urban fabric as findings.

» Keywords

tradition, urban fabric, Islamic city, conception

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- [Şahin DURAK, Nevnihal ERDOĞAN](#)

The Architectural Accessibility Standards within the Scope of "The Regulations on the Accessibility Monitoring and Auditing" Enforced in Turkey: Case of Yalova Government Building

» Abstract

Today, particularly the disabled and elderly people can fail to access easily the product or place they wish in their daily lives and can become dependent on someone due to accessibility problem experienced in numerous societies. This situation can also be encountered in the public buildings frequently used by the citizens. The areas such as wheelchair ramps, WC for the disabled, parking space for the disabled, access for the disabled, tactile pathways and stairs are incorrectly implemented or never implemented in many public buildings according to the standards for the disabled. Within this context, an important step has been taken with the "Regulations on the Accessibility Monitoring and Auditing" which was published on 20.07.2013 in Turkey. The commissions have been established throughout the provinces with this regulations covering all kinds of buildings, which provide public services, open areas and public transport vehicles and the issues which are included in the scope have been started to be audited by these commissions through the monitoring and auditing forms, which involve many items and are annexes to the regulations. This significant development for the accessibility has been greatly welcomed by the disabled citizens and positive feedbacks have been received. However, there are solutions expected for several problems, which are encountered in implementation of the regulations for the existing buildings. The implementation of this regulation throughout the Government Building, which was designed for Yalova, will be examined in this study. Thus, "Accessibility Monitoring and Auditing Form for the Building", being one of the annexes to this regulation, is examined, the implementation of the accessibility standards, which must be considered in the architectural designs, for the public building is investigated and an example is presented.

» Keywords

public building, government building, Yalova, accessibility standards, standardization

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- **Şahin DURAK**

Implementing the Principles and Standards of Sustainability in the Example of Government Building**» Abstract**

Natural resources have decreased with each passing day due to problems such as developing population, increasing needs, and consumption growth and the sustainability has become further important. Public buildings, which have an important area of usage in our daily life, may also have higher energy consumption and this situation damages the sustainability. These buildings, which have both high number of users and a lot of spaces and mostly cover a huge area, need a serious energy requirement while meeting their basic needs such as lighting, heating, and cooling. For public buildings that are not designed as sustainable, this situation both brings an important financial loss and damages the sustainability of our nature. For this reason, it is very important to consider public buildings in accordance with the standards of the sustainability during their design processes. In this study, it will be examined how basic principles and standards of sustainability are implemented in an example Government Building designed for Yalova and how these principles and standards direct the building design. Thus, it will be investigated what the sustainability standards to be used during design process of public buildings may be and a design example in accordance with these principles will be presented.

» Keywords

public building, government building, Yalova, sustainability standards, standardization

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- **Tineke Mirjam EGYEDI**

On Technology Choice in Standardization: Implications for Patent Valuation**» Abstract**

The valuation of patents included in standards and their reasonable license fees is affected by two competing views about how and why standards are developed. One view, which emphasizes that standardization is foremost about choosing a technical solution, assumes the availability of roughly equivalent alternatives; the other emphasizes that standardization is foremost about picking the best technical solution, assuming distinctly different alternatives. These views affect patent valuations but often remain implicit in economic and legal studies. This paper examines which view is more accurate from the perspective of standardizers using data from expert interviews and literature study. While the study suggests that the availability of roughly equivalent alternatives is generally more accurate, neither view well-captures the reality of standard development. Typically, the relative technical merit of competing solutions is an important selection criterion, but it is secondary to other critical factors. The findings highlight

the interrelatedness of the many technical design choices usually at stake; the negotiability of and trade-offs between multiple performance criteria determining the value of technical solutions; the filtering effect of consensus versus voting committees on actual technology choice; and, not least, the influence of non-technical factors on technology choice. Given these caveats, valuating patents-in-standards on their technical, innovative merit will remain contentious. To better account for the influence of the dynamics of standards processes on technology choice, a valuator's line of reasoning should address, among other factors, existing alternative technical solutions and multiple performance dimensions. Follow-up research is recommended to examine the implications of patent inclusion for these dynamics.

» **Keywords**

standardizers, patents, innovation, reasonable royalties, patent valuation

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- **Lachezar GRIGOROV, Marusia TEOFILOVA**

Aspects of Fire Regulations and Standards in the Atrium

» **Abstract**

Flexibilities of open spaces in modern public buildings organized by and around large atriums is increasingly sought after in architectural practice. Along with this increase and the requirements for fire safety and timely evacuation. They develop building codes, regulations and standards. Different countries treat problem variant in development, but with a common logic. What is the problem of the large and multi-storey atriums and what similarities and differences in protection of people and property in case of fire in different regions of the world. Various methodologies, technologies and materials. The development of thought and methodology is the development of technology. Examples of author and world practice. Specific features of local standards for fire safety and evacuation. A brief overview of the development of thinking on the issue.

» **Keywords**

atrium, fire regulations, evacuation, architecture, flexibility

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- **Elif Yeşim Özgen KÖSTEN, Hazal ÖZTÜRK**

Typical Construction Regulations in Turkey: Standard Housing - Standard Human

» **Abstract**

“Standardization” which enabled the increase of production in the 19th Century, took a completely different dimension through the Industrial Revolution as the product became widely distributable and marketable. From chairs to cars, aside from many products of varying scales, “House” that is arguably one of the most decisive factors that indicate the identity and heritage, now became a standardized product which led to a shift in collective societal and spatial understanding. While the cities were spatial networks with their own “continuity, boundaries and rhythms” up until 19th Century, in the 20th Century, they became an order in which independent standardized units standing in a “disjointed and sparse” manner. The escalation of this situation led to a country-wide standardization with the aid of the Typical Zoning and Construction Regulations that determine the construction criteria in Turkey. Therefore, the process that developed without regard to local values formed its own dynamics and persisted, led to the threat of the formation of a new country identity that ignores the subjectivity and dwells in uniformity with a standard planning approach. Within the scope of work, Urban transformation process in Turkey and Standardized TOKI Housing Projects throughout the diverse Anatolia Region with different cultural, geographical and historical backgrounds which both trigger this ever growing problem, are to be examined in order to reveal the status of standardization in Turkey. In addition to that, a critical approach will be utilized towards the dynamics that encourage the facilitation of “standard housing” - “standard human” and as a reaction, the possibility of a new building standard which would strengthen the local identity and merge with the social, cultural and geographical texture will be hinted. In this paper, taking the city of Kocaeli as a case study, the typical zoning regulations that shape the housing typology in newly built settlements will be criticized and the possibility of new regulations that would enable the prioritizing of local identities and local strategies that will be hinted.

» **Keywords**

typical zoning and construction regulations, urban transformation, mass housing, standardization, local identity

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- **Mariana MITOVA, Milka VICHEVA**

Expert Information Assurance of Selected Groups of Machine with European Requirements and Safety Norms

» Abstract

The article presents an approach to information assurance of machines with European requirements and safety standards. Systematization for product groups and standards for them is established. An initial systematization of data on European harmonization legislation is created while directives of New and modular approach are divided into 4 categories. Two approaches to classification of groups and types of products in regard to Directives are developed. For product group Electric passenger and goods passenger lifts, a study is presented involving systematization of applicable essential requirements, harmonized standards and norms of harmonized standards. In order to optimum safety requirements, the relationship between elements of the product group and the corresponding requirements of the directives and rewarding those rules of harmonized standards is specified. The result of expert research is presented in the Expert Information System.

» Keywords

directive 2014/33/EU, harmonized standard, essential requirements for safety, lift, expert information system

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- **Dimitrios MYLONAS, Konstantinos MPETOS**

Internal Audit as a Factor of Cost Management: 3rd and 4th Sanitary Periphery of Macedonia and Thrace

» Abstract

The purpose of this article is to show the necessity of the procedure of Internal Audit, as a strategy of rationalization of cost management in a public health care organization. The objectives of this article in theory and research are:

1. To study the procedures of Internal Audit and to find methods of applying it
2. To bring up the importance of Internal Audit when it comes to the proper function of health care organizations
3. Registration and evaluation of the procedures that are made in order to rationalize the function cost of Internal Audit
4. Evaluation of the methods that are used by the Internal Audit department in the 3rd and 4th Sanitary Periphery of Macedonia and Thrace
5. Designation of the best application model of Internal Audit, so that the most possible participation is achieved when it comes to the rationalization of health care organization function cost.

Inquiries that are analyzed are:

1. Procedures and methods that help applying Internal Audit
2. Acceptance and application of operational procedures - Controls by the organization executives
3. Registration and evaluation of the procedures of Internal Audit and bringing up measures of correction or improvement with the purpose of controlling the function cost of sanitary organizations.

» Keywords

internal audit, controlling standards, cost rationalization, public health care organization

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- **Luminița POPA**

CAD Standard Design Elements for Injection Molds

» Abstract

The economic side of the design process required their optimization based on criteria to ensure designed products competitiveness. This paper aims to provide rapid methods of designing plastic injection moulds using CAD filing systems modelled in Solid Works. Article addresses the issue of using innovative high performance technology, integrated into a unitary concept.

» Keywords

injection molds, CAD standard, Solid Works

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- **Aikaterini POUSTOURLI**

European and International Workshop Agreements: A Brief Example in Security Research Areas

>> Abstract

This paper summarizes the process for development Workshop Agreements in the European and in the International Standardisation framework that are relative to European Security Research initiatives for standardization. A brief analysis for the necessary implementation steps is presented and the involvement of the authorized technical committees as well. Moreover, a few indicative tables of the most representative current standards are listed and in the end, the general advantages are highlighting.

>> Keywords

standards, security, European Standardisation Organisations (ESOs), Common Workshop Agreement (CWA), International Workshop Agreement (IWA), CEN, CENELEC, ETSI

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- **Aikaterini POUSTOURLI**

A Concise Survey of Security Standards and Certification Services**>> Abstract**

After the terrorist events in Paris and Brussels, it is considered more than ever crucial and essential for the European Union to proceed in a cohesion, close cooperation and establishment of a common language on security topics. A number of international standards to achieving the goals of the Europe 2020 strategy in terms of smart, sustainable and inclusive growth. Taking into account that Standards facilitate innovation by providing a balance between collaboration and competition, the existent and the ongoing security standards and certification schemes are oriented and focused to deal with the demands and the trends of the new era regarding the technological evolutions, threats, risks. This work is a literature review, a concise survey on the main European and United States certification services, organisations and standards. The challenge of robust and mutual beneficial collaborations internationally in transatlantic level is considering fundamental for many policy makers and security stakeholders. Scientist share their agony for joining contributions and efforts in order to achieve robustness and resilience in European and global environment that will lead in smart and resilient societies in a better world for the future generations.

>> Keywords

standardisation, security, critical infrastructures protection, research, certification, accreditation, quality schemes, conformity assessment, harmonisation

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- **Aikaterini POUSTOURLI**

European Security Standardisation: An Overview of EC 487 Mandate**>> Abstract**

Due to the lack of European security standards and mainly under the global need for common efforts in order to strengthen the European societies from natural and manmade risks, threats and disasters, EU issued several Mandates like M/487. The specific Mandate concerns the analysis of the current security standards landscape in Europe taking account of the legislative background and having an exclusively civil application focus. It is completed in two phases until nowadays. The first phase achieved the Analysis of the Current Security Landscape (2012) and the second one phase completed the documentation of the proposed standardization work programmes and road maps execution (2013). The execution of the Mandate was undertaken in close cooperation with the widest possible range of interested groups and particularly the Joint Research Centre of the European Commission (JRC), the European Standardisation Organisations (ESOs), the European Network of Law Enforcement Technology Services (ENLETS), European Network of Forensic Science Institutes (ENFSI), Security industry organisations like European Organisation for Security (EOS), European Research Institutes and Agencies as well as those of National Agencies and European Technology Platforms with a relevant interest in this domain. International cooperation was ensured, in particular with IEC, ISO and ITU. In the beginning of 2016 and after the events of November in Paris and of March in Brussels is highly topical a review of their results and the possible transition to the next third phase.

>> Keywords

standardisation, security, mandates, European Commission, CBRNE

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- **Giannis TSARAS, Evangelos CHRYSAFIDIS, Dimitris GIOUZEPAS, Panagiotis GOULIARIS**

The Auditorium Chair Standardisation. Evolution of the Seating and the

Anthropometric Scale of the Auditorium

» Abstract

The performance halls are categorised based on their use and their size, meaning, the type of performance that they can host and the number of spectators that can be accommodated. The key element that determines the size of a venue is the anthropometric coefficient. Since the emergence of the proscenium scene type, the dimensions of the auditorium have changed many times, both in size and in proportions, affecting the overall design of the space. Particularly, from the moment that the seat of the audience became a product, it acquired standard dimensions that met both house specifications and human scale. The human size determines the dimensions of the seat and thus the required space of the spectators and the size of the room. As the stature of the "average" person has increased, the requirements for auditorium seating have changed. The dimension of the auditorium chair has considerably increased over the last 50 years, as modern lifestyles and modern eating habits have contributed to the increase of the average person's size, redefining design and sizes of several products. The aim of this paper is to identify and present the relation between the auditorium's chair size with the human size evolution, as well as specifications that the performance hall requires.

» Keywords

human size, theatre design, theatre chair, auditorium seat, auditorium size

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- **Octavia ZELENIU**

Standards and Regulations Concerning the Formaldehyde Emissions from Wood Panels

» Abstract

The formaldehyde is an issue for wood-based composites industry. Long exposure at high levels of formaldehyde led to severe health problems. The International Agency for Research on Cancer (IARC) recommended classification of formaldehyde from Group 2A-"probabil carcinogenic to humans" to Group 1-"carcinogenic to humans". As a consequence, new limits for formaldehyde emission were established for wood panels. These are set in specified standards in Europe, USA and Japan. There are also specific rules established at national levels that limit the values of formaldehyde emission in the range of 0.05 ppm - 0.11 ppm, for hardwood plywood, particleboard and medium density fibreboard known as CARB regulations, valid in California. Therefore, with the new requirements concerning the air quality and products, many wood composites companies at international level produce also panels according to the CARB rules. There are different standardised methods that are used in formaldehyde determination, each of them are characterised by test conditions and specific unit measure for emission and content respectively. This paper aims to review the formaldehyde regulations and methods used for formaldehyde determination in order to highlight the importance of formaldehyde evaluation by all manufacturers of wood-based panels increasing the quality of their products their products.

» Keywords

formaldehyde, regulations, wood panel, methods

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- **Mustafa AL-ALWANI**

A Development Framework for Smart Cities Assessment

» Abstract

A smart city is rising as a strategy to reduce the problems generated by rapid urbanization and the urban population growth. Although, cities continue to develop and purify their social, economic and environmental goals along with the strategies to achieve them, this phenomenon has been discussed by little research yet. However, due to the urgent need for practical application of the principles of smart cities, city authorities, stakeholders and local communities need to understand how their city is performing today and where progress is being achieved in their systems. Therefore, constructing a guiding framework for smart cities assessment is a crucial key to help communicate emerging strengths and weaknesses, and highlight where real progress is taking place and inform a plan for future progresses. Moreover, this assessment is able to assist cities prioritizes actions. This paper developed a guiding assessment framework for smart cities that will facilitate the formulation, selection and priorities of key indicators that can then guide the assessment and monitoring of the smart cities performance. Drawing on the exploration of an extensive and wide array of literature from a variety of disciplinary areas and based on the conceptual literature on smart cities, in addition to interviews this study identify a good tool to help understanding of relative achievement of smart city. Furthermore, it is important to be taking into consideration in assessing the extent of smart city.

» Keywords

smart city, framework, indicators, assessment

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- **Belma ALIK, Sonay AYYILDIZ**

Fractals and Fractal Design in Architecture**» Abstract**

Fractal geometry defines rough or fragmented geometric shapes that can be subdivided in parts, each of which is (at least approximately) a reduced-size copy of the whole. In short, irregular details or patterns are repeated themselves in even smaller scale. Fractal geometry deal with the concept of self-similarity and roughness in the nature. The most important properties of fractals are repeating formations, self-similarity, a non-integer dimension, and so called fractional size, which can be defined by a parameter in irregular shapes. Fractals are formed by a repetition of patterns, shapes or a mathematical equation. Formation is dependent on the initial format. Not only in nature, fractals are also seen in the study of various disciplines such as physics, mathematics, economics, medicine and architecture. For a variety of reasons, in different cultures and geography, many times the fractal pattern had reflected on creating the architecture. In the computer-aided architectural design area, fractals are considered as a subset for the representation of knowledge for design aid and syntactic science of the grammatical form. If compared with the grammar of shapes, the number of rules used in the production process of fractals is defined as less, with number of repetitions as more and self-similarity feature, it can be a tool to help qualified geometric design. A simple form produced with fractal geometry with ultimate repetition is being transformed into an algorithmic complex. This algorithm with an initial state and a production standard that applies to this initial state produces self-similar formats. In this study, the development of the fractals from the past to the present, the use of fractals in different research areas and the investigation of examples of fractal properties in the field of architecture has been researched.

» Keywords

fractals, fractal geometry, fractal design, fractals in architecture

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- **Hatice BEKTAS**

Sustainable Forest Management System**» Abstract**

Sustainable forest management addresses forest degradation and deforestation while increasing direct benefits to people and the environment. At the social level, sustainable forest management contributes to livelihoods, income generation and employment. At the environmental level, it contributes to important services such as carbon sequestration and water, soil and biodiversity conservation. The forest ecosystem is highly complex, and influenced by numerous external factors. Similarly, different forest types in different regions of the world require different sustainable management strategies. Turkey has 21.678.134 ha forest area and all of the forests of Turkey (99.9%) are state-owned property. Sustainable forest management is an important issue and Turkish Standards Institute (TSE) and General Directorate of Forestry work together for this purpose. At the beginning, standard setting facilities of sustainable forest management and chain of custody (CoC) has been started. For national sustainable forest management certification “Programme for the Endorsement of Forest Certification (PEFC)” system is adopted. PEFC system include two types of certification. Forest management certification is a way to demonstrate the forestry operations are managed economically feasible, socially equitable/beneficial and environmentally reliable by forest owners/managers. Chain of Custody (CoC) certification is a process that verify the production chain of forest products. CoC certificate is issued to companies who wants to show that they use forest raw material produced from sustainable managed forests. Turkish Standards Institute has started to prepare PEFC requirements to be National Governing Body, PEFC Turkey. PEFC Turkey will be national system for forestry. Turkey Forest Certification Programme relies upon three separate functions: standard setting, certification and accreditation. PEFC membership has several steps: establishing the organization, developing the system, PEFC Council membership, PEFC Endorsement, running the system.

» Keywords

sustainable forest management, forest management certification, chain of custody certification, national forest management

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- **Ramona CLINCIU**

Calculation of Desired Coefficients for the Characteristic Equation of Closed Automatic Control System

» **Abstract**

The paper presents a study aimed at estimating the calibration life of the measuring instruments as a function of the metrological reliability, by considering the internal parameter deviation functions. The study is performed on length measuring instruments, caliper rules and micrometers. The experimental study conducted is aimed at determining the calibration life of external micrometers for 0 - 25 mm and of external caliper rules of 150 mm, with depth rod and with a resolution of 0.1 mm. The experimental data is obtained in laboratory conditions and is represented by the measuring errors, obtained for the same nominal size. Data is grouped in samples produced at a certain interval of time, by measuring the same dimension with a set of caliper rules and a set of micrometers, respectively. By performing an appropriate program, in the case of a set of specific measuring instruments, it is possible to test whether the estimated values obtained for the calibration life in each case considered meet the requirements set in the appropriate standards. The estimated calibration life of the measuring instruments considered was compared to that stated in the appropriate standards. In both cases considered, for the caliper rules and micrometers, the pre-set calibration life proved to be less than the estimated one, such as by considering the proposed method, the costs of the appropriate operation would be reduced.

» **Keywords**

caliper rules, micrometers, calibration life, parameter deviation, metrological reliability

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- **Adrian DANILA, Radu CAMPEANU**

Accurate Determination of the Thermal Model Time Constant for the Electrical Servomotors

» **Abstract**

The thermal model of the electrical drives is used to predict the critical thermal stress of the drive in conjunction with its duty cycle. The accuracy of the predictions based on the simplified thermal models depend on the accuracy of the estimates for the model's parameters. In this work, authors investigated the implementation of the infrared cameras and EDT method for the contactless estimation of the time constant of the thermal model of the electrical machines. In the first and the second chapter of the work, the theoretical background is presented. The main standards related to the problem are revised and the single-body model of the electrical machine is emphasized. In the third and the fourth chapters the experimental implementation and results are presented. The investigation proved that the time-dependency of the maxima temperature, determined with the thermal camera, follows an exponential curve as given in the literature and may be used for the accurate estimation of the time constant of the thermal model of the drive.

» **Keywords**

electrical servomotors, thermal model, time constant, thermal camera

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- **Adela-Eliza DUMITRASCU, Dorin-Ion DUMITRASCU, Flavius Aurelian SÂRBU**

Approach of Assessment the Overall Necessity of Supply Logistics Processes Improvement

» **Abstract**

This paper presents a study on the evaluation of significant environmental aspects of industrial processes according to ISO 14001: 2005. The aim is to establish harmonized methodology t the organization, identification of environmental aspects associated with the operations of collection, storage, recycling and the impacts associated with them in order to monitor and control significant environmental aspects. The process of identification of environmental aspects is made by analyzing all processes / services, phases, operations, activity areas, taking into account normal operating conditions, abnormal (starts, stops, overloading, maintenance, etc.) and emergency situations. The results of the evaluation process, the main significant aspects of environmental concerns to: risk of leak of dangerous substances, soil pollution, waste oil generation and impregnated materials.

» **Keywords**

evaluation criteria, significant environmental aspect, environmental impact

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- [Ayşe DURUKAN KOPUZ, Özlem GUNAY KARADISOĞULLARI, Fatma Ceyda GUNAY](#)

From Municipality Building to a City Museum in Trakia Region; A Case of Town Çorlu

» Abstract

The town of Tekirdağ named as Çorlu located on the way to Europe, attracts attention by its important location where is being an entrance from Turkey to Europe. The people going to Europe can visit this small place and have an experience about the town. When they are having time in the location, they can also visit some places to have an idea of the city, environment and culture. One of the important places for visiting is the City Museum located in the center of the town. This paper considers the city museum of Çorlu town that was restored by the beginning of 2015, and being used from that time until now. The characteristics of the building will be performed in details with architectural sights. By this way, an intensive research on the city museum building was carried out in order to understand the relations of physical environment of the site and the cultural identity.

» Keywords

Çorlu town, City Museums, restoration of Municipality building, historical buildings

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- [Naser KABASHI, Cenë KRASNIQI, Qani KADIRI, Arton DAUTAJ](#)

Masonry Structures Confinement with Glass Fiber Reinforcement Polymers

» Abstract

The era of application the fiber-reinforced polymers (FRP) as a means of increasing the capacity of masonry through strengthening and confinement. Subject is addressed on strengthening of existing masonry structures. The new Codes and new methods are focused on improvement the behavior the masonry structures under the seismic load. In this study the four series are tested in different conditions and different parameters, focused on the behavior the masonry elements and behavior the infill concrete frames with masonry elements. The series of tests are models masonry columns with these variables: geometrical parameters; cross-section of columns and type of fibers. It is concluded that, in general confinement increases both the load-carrying capacity and the deformability of masonry almost linearly with the average confining stress. All the requested parameters are followed with the experimental works.

» Keywords

FRP, strengthening, masonry structures, confinement

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- [Seda KAPLAN ÇİNÇİN, Nevnihal ERDOĞAN](#)

The Evaluation of Waterfront as a Public Space in Terms of the Quality Concept, Case of Maltepe Fill Area

» Abstract

The quality and publicity of waterfront area have problems in Istanbul, an important coastal city in common with all character as history, culture, tourism or industrial city. Moreover, the rent oriented building trade has become decision maker of urban land use, change and transformation in Istanbul, which has continuous population growth. Thus, insufficiency of open public space increases in Istanbul where built-up area increases day by day. Inevitably, waterfront areas are affected from construction process of Istanbul. Especially, waterfront areas have problems in terms of public space quality. On the other hand, in the world city Istanbul, lots of projects are developed in order to solve the lack of public spaces however they usually are seen rent oriented. Within the scope of the paper, Maltepe fill area, which is a waterfront project was developed in Anatolian side of Istanbul by Istanbul Metropolitan Municipality in order to solve the lack of open public spaces because of the overpopulation and built up area, will be evaluated in terms of the public space quality. The municipality aimed to design the biggest live, sport and entertainment center in Europe with this project that is 120 hectare fill area with 3,5 km length and 400 m width. However, the fill area breaks off the city, citizen and coast relation because of the scale of the project. In this concept, the evaluation of the fill area project will be done according to the some subjects explained in a paper "The consideration of coast usage as a public space in terms of the quality concept in Kocaeli" which was presented in 12th international conference standardization, prototypes and quality.

» Keywords

waterfront, public space, quality, İstanbul, Maltepe fill area

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- **Constantin MILITARU, Cristina JUGANARU, Emil MILITARU**

Some Aspects Related to the “Context of the Organization” Clause for a Quality Management System and the Correlation with “Risk Based Thinking” Stated in SR EN ISO 9001:2015

» Abstract

“Context of the organization” is a new clause in SR EN ISO 9001:2015, which requires that an organization must consider both the internal and external issues that can impact its strategic objectives and the planning of the Quality Management System (QMS). In this paper are approached some external and internal relevant aspects, which in a strategic vision may influence the performance and the capability of a QMS. Because of their influence and their direct and/or potential effects, these aspects may influence the organization’s performance and capability. The actual structure of the SR EN ISO 9001:2015 with documented information and “risk-based thinking” approach helps to reduce the uncertainties, to properly identify the risks, treating them and to determine new improvement opportunities.

» Keywords

context of the organization, risk, quality management system

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- **Dimitrios MYLONAS, Georgios MIHALITSIOS**

Investigation, Estimation and Evaluation of Creditworthiness of a Company’s Clients. Case Study Barba Stathis S.A. Company

» Abstract

The environment, in which all financial decisions take place, has shown today, radical changes. Globalization, competition, economic crisis and uncertainty are essential issues that are linked directly, in a cohesive way, with the financial problems of the companies. It is, therefore, very common in our daily operation, that the managers of the companies as well as bank institutions ought to take vital decisions, as regards to credit granting, loans or mortgages, possibility of bankruptcy of partners or customers and generally, with the evaluation of credit risk of the companies. The last seven years, as an obvious result of the global economic crisis, as well as the recession in Greece, the percentage of the companies facing the possibility of bankruptcy, due to decrease of their turnover, has dramatically increased. The continuous as well as unceasing attempt of Barba Stathis S.A. for the reduction of all precarities and credit risks, in coordination with the B-2-B sales domestically and abroad, has resulted into the adoption and thus implementation of an up-to-date effective model of the evaluation of the creditworthiness of the company clients, which is a valuable tool in handling successfully the credit threats. The implementation of this model will provide answers and solutions to issues and concerns which are directly involved with the expanded credit limits which have been placed on the “negotiations table” from the big retail market players, with the increased precarities of the clients due to lack of capitals, together with the credit policies of the competition, in the frozen vegetables sector.

» Keywords

credit policy, creditworthiness, evaluation and control of the creditworthiness, credit risk, credit prototypes

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- **Dimitrios MYLONAS, Kyriakos KELIDIS**

Internal Auditing of the System Governance of Procurement, as an Economic and Effective Key Factor for the Proper Management of Corporate Resources: Case Study of “Titan” Cement S.A.

» Abstract

Internal audit activities are carried out in various cultural environments, to organizations that differ in size, complexity, purpose, structure and more. These differences may affect the effective implementation of internal control. International Standards were created and established for the professional implementation of Auditing, intending either to the diminution or normalization of these differentiations as well as having ultimate aim to an optimal and unimpeded auditing. The system of internal control is like the nervous system of the human body. It ramifies across the entire organization, transferring commands and reactions to and from the administration. However, it is totally geared towards organization’s needs. Procurement function is defined as the decision-making process for the determination and selection of quality, quantity, price, time and the source market for an object - material -

product - goods or service that the acquisition has been decided by the administration. Likewise, Procurement function defines rules and limitations ensuring that delivery fully meets the required standards. The fundamental objectives of Purchasing usually are determined by the buying of right quality, in the right quantity, at the right time, at the right value, from the right source. The article aims to determine and point out the need for internal control (internal audit), how its implementation to the Procurement department of the cement industry TITAN S.A. is figured as process as much as an ideal catalyst, deriving to efficient financial management of resources. A proper financial management and administration in conjunction with the appropriate coordination of individual departments of the organization, furthermore within a well-organized internal control, increases, obviously, the chances of an effective administration, business development and certain profitability.

» **Keywords**

internal audit, controlling standards, effective administration, development, profitability

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- **Mehtap ÖZBAYRAKTAR**

Designing "Livable Children Spaces" in Urban Space: Child-Friendly Streets and Turkey Example

» **Abstract**

Streets as one of the urban spaces are defined on one hand as roads between buildings and surfaces limited by neighbouring buildings and on the other hand as elements of urban existence, communication areas and face to face communication spaces, socializing areas allowing creation of collective memory and a bridge between individual and community. However streets, which have such important properties in cities, have been changed and are changing radically due to technological developments, land speculation, traffic problems, transportation-related urban transformation and the modernist planning. The streets, which were once the "places of socialization", are now left to the hegemony of motor vehicles. As a result, the vehicle density and noise forced people to live in indoor spaces. With the safety problems (traffic, crime rates etc.) included, the "street life" has gradually disappeared. Disappearing of street life maybe mostly affected children. Today's children can no longer use the streets which are the "most accessible urban spaces; the changes prevent the physical activities of children and have negative impact on their health. Today, children cannot go outside on their own and are always supervised by someone, and they spend most of their time at school, doing homework or attending language courses and sports activities. UNICEF reported that most of the children around the world are living in cities and towns. The report declares that 7 out of 10 people will live in cities by 2050, which shows how bad the situation is for children. United Nations and UNICEF are working on important projects to make the cities more liveable for children. "Child Friendly Cities Initiative" is one of the most important projects in this field. Among the other initiatives are "Growing- Up Cities" and the initiatives aiming for "liveable streets for children" which are implemented in Northern Europe countries, Australia, the States and Japan. In Turkey due to immigration from villages to cities last 30 years, 65% of the population live in cities. As the children population living in cities increase, taking children requirements and priorities into consideration started to become an important problem. In this sense, initiatives were taken by UNICEF Turkey in order to develop child friendly policies and creating child friendly spaces. One of these initiatives is the "Child Friendly Cities" project. The project was implemented between 2014 and 2015. The other one of the studies performed is "child-friendly street". This study aims to comparatively analyze the process of developing "child friendly streets" in Turkey designed within the scope of the child friendly cities project as well as the principles adopted and problems encountered during the process. In this sense, the activities carried out by the municipalities of Ankara- Mamak and Kırklareli- Lüleburgaz with regard to the "child friendly streets" project were examined.

» **Keywords**

child-friendly cities, liveable streets, child-friendly streets, Turkey

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- **Jasim SAMIR, Sabr HAMZA**

Design and Implement of a Real Time Health Monitoring FHSS Using NRF24L01 Transceiver

» **Abstract**

The objective of this work is to design and implement of real time health monitoring system. The system is based on frequency hopping spread spectrum technique. The designed wireless communication system can operate under complex environment, serious electromagnetic

interference and its supported higher data reliability. The system uses the NRF24L01 transceivers and E-health Sensor Platform V2.0 with three medical sensors. The sensors collect biological signals from patient's body, and then these signals are processed by using arduino platform (UNO-R3 Module). The designed system transmitted the sensors data through 31 frequency-hopping channels with hopping rate of 100 hops/sec. At the receiver side, the received data is displayed in PC by using the serial monitoring of the IDE program. The spectrum of the channels can be seen by using the RF Explorer-3G combo spectrum analyzer with touchstone pro program. In this paper, the real time frequency hopping system is characterized with low power consumption, high data rate, better standby time performance, low cost, portable and designed with user friendly software tools.

» **Keywords**

health monitoring system, wireless communication system, frequency hopping spread spectrum technique, NRF24L01 transceivers, e-health sensor platform

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- **Sema SANDALCI, Aysin ÖZÜGÜL, Berna ÇAÇAN ONGUN**

Hephaestus the God of Artisans as an Architect Model

» **Abstract**

As an interdisciplinary contribution, the aim of this study is to provide a sample to specify the need to be an architect and offer a cultural perspective on what are an architect's skills and how an architect tests his ability by taking Hephaestus the god of craftsman in the Greek mythology as a model. It will also be shown how these historical traces influenced various architects of the time. Especially, Hephaestus' features mentioned based on the oldest texts of Greek culture like Homer's Iliad, Odyssey, Hesiod's Theogonia. In order to emphasize the continuity of this mentality, will be briefly mentioned some considerable architects from ancient, mediaeval, Ottoman and contemporary times. The goal of the study is also to accentuate the transfer of master builders' abilities from generation to generation, and to understand the soul and mind power which create the peerless works of the art of construction based on master and apprentice relationship. Thus, at least the connection between the main features of the Ottoman and Turkish architecture, and Antiquity, can be also revealed.

» **Keywords**

antiquity, late antique, Ottoman, building art, God symbol, craft, architect, traditional tracks, master-apprentice

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- **Cosmin SPIRCHEZ, Badea LEPADATESCU, Aurel LUNGULEASA, Liviu GACEU**

The Importance Biomass Quality Source of Renewable Energy

» **Abstract**

Experts estimate that Romania has a high biomass energy potential, estimated at about 7594 tonnes of oil equivalent/year. This value it represent 19% of total consumption of primary resources 2010, divided into the following categories of fuels, residues from forestry 1175 tonnes of oil equivalent/year, waste wood 487 tonnes of oil equivalent/year, agricultural wastes resulting from grain 4799 tonnes of oil equivalent/year, biogas 588 tonnes of oil equivalent/year.

» **Keywords**

wood biomass, combustion, renewable energy, calorific value

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- **Angelos ZACHARIADIS, Kanella CHATZIMICHAIL, Dimitrios CHATZIMICHAIL**

Changes in the Human Activities during the Industrialization

» **Abstract**

During the Preindustrial Era the production of goods and services was done in small scale by cottage industries and crofters. The SMEs of that time could then form coalitions, cooperation's, or collaborations, small or big, due to the specific demands of the time. Also the different specialties came together in unionisms, which acted then as consultants to the Rulers or Governments, in order to legislate the rules, the standards, the specifications etc. In this way, the preindustrial SME's were able to adjust to the changes of their environment. The small measures and the locality were in harmonic balance with natural and technical environment. Additionally the cottage industry owners and the crofters had ensured the feedback of the results

of their activities, as they had the direct contact with the consumer-users of their products or services. The quality control of products and services was also direct, and additionally fair, according to the consumer-users' needs and wishes. All these characteristics changed dramatically, following the evolutions of industrialization. At the end of the Industrial Era, as the locality was replaced by the globalization, the changes reached their apogee and predispose an explosion. We can now go forward, though, with ideas and proposals for postindustrial prototypes - models, by analyzing the facts that brought the changes. After such, the comparison of the preindustrial and the industrial models can guide us this postindustrial prototype-model.

» **Keywords**

cottage industry, crofters, harmony, balance, environment

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- **Angelos ZACHARIADIS, Konstantinos PAPATHANASIOU**

Differentiations of the Industrial Financial Credit System from the Preindustrial Models

» **Abstract**

During the Preindustrial Era the production of goods and services was done in small scale by cottage industry and crofters. The SMEs of that time could then form coalitions, cooperation's, or collaborations, small or big, due to the specific demands of the time. Also the different specialties came together in unionisms, which acted then as consultants to the Rulers or Governments, in order to legislate the rules, the standards, the specifications etc. In this way, the preindustrial SME's were able to adjust to the changes of their environment. The small measures and the locality were in harmonic balance with natural and technical environment. Additionally the cottage industry owners and the crofters had ensured the feedback of the results of their activities, as they had the direct contact with the consumer-users of their products or services. The quality control of products and services was also direct, and additionally fair, according to the consumer - users' needs and wishes. All these characteristics changed dramatically, following the evolutions of industrialization. At the end of the Industrial Era, as the locality was replaced by the globalization, the changes reached their apogee and predispose an explosion. We can now go forward, though, with ideas and proposals for postindustrial prototypes, by analyzing the facts which brought the changes. After such, the comparison of the preindustrial and the industrial models can guide us to a postindustrial model.

» **Keywords**

cottage industry, crofters, harmony, balance, environment, financial credit system

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- **Georgia ZACHAROPOULOU**

Conceptual and Methodological Aspects of Documenting the History and the Future of Monuments Restoration - Towards an Interdisciplinary Perspective

» **Abstract**

The objective of the paper is the methodological presentation of the basic principles towards a critical interdisciplinary approach for studying the history of monuments restoration, valid for different cultures. The proposed integrated framework offers the possibility to study and document monuments restoration in various spatial levels e.g. global, continental, international, national, regional, and local. The conceptual and methodological aspects are based on the following fundamental pillars a) the development of science and technology, including relevant history of education, b) the evolution of the restoration philosophy, c) the incorporation of the above in restoration projects at a lower level, d) the infiltration of the above in restoration interventions at the lowest level. The author expects that the above successive and/or parallel levels of scientific branches can contribute effectively to the analysis, synthesis and comparative assessment of the aspects and criteria that influenced monuments restoration timeline. The challenge for the researcher of the monuments restoration history is the adjustment of the whole process to his own -under research- level in such a way as to take advantage of all the interdisciplinary inputs creating, thus, inventive links and stimulating new information and knowledge. The above are briefly tested in the case study of Thessaloniki, Macedonia, Greece. Such an inductive approach will enable all disciplines to devote their finest efforts towards understanding, documenting and studying monuments restoration history and, thus, support effectively a sustainable future for the world's cultural heritage.

» **Keywords**

interdisciplinary, inductive reasoning, restoration philosophy, science and technology, monuments restoration

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- **Kadhim F. AL-SULTANI, Sarah Abdulameer Abdulmahdi**

Extraction of Vanadium from Fly Ash Produced in Heavy Fuel in Power Generation Station

» Abstract

In the present research work, extraction of vanadium from fly ash produced in heavy fuel in power generation station was carried out. Effects of sodium hydroxide concentration, temperature and leaching time on the extraction percentage of vanadium have been investigated. The results show that the optimal conditions of extraction as follows: the concentration of sodium hydroxide is 12M, the ratio of liquid to solid is 5, the temperature 100 °C and leaching time four hours. Under these conditions, the extraction of vanadium can reach 98%.

» Keywords

vanadium, heavy fuel, fly ash, leaching, extraction

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- **Sonay AYYILDIZ**

Prototype Concept in Architecture and Comparative Analysis of Analogical Designs and Imitated Buildings

» Abstract

Archetype, prototype, stereotype are the concepts associated with the type concept, yet they have their own meanings. Especially, defining the border of type between archetype and prototype, and defining the difference between archetype and prototype matters in terms of architectural discussions. If the need arises to make an architectural-oriented reduction to prevent the incomprehensibility, we can define the archetype as “first concrete ancestral example”, prototype as “first model prepared for industrialized production” and stereotype as “the face of two of a kind produced work taken as a model”. It is true that prototype will gain favour in many areas when it is considered as mass production oriented. However in architecture, building one building’s lookalike is not only anomalous to architecture ethic but also it is uncreative. In addition to this, many architects design their works by being inspired by some objects (living or non-living) that are available in nature or by being affected by previous movements and architectural approaches. “Analogies” have an important place in parallel with “Mimicking” which is an important step in design process of architectures. When it comes to Architecture, It is not easy to talk about a fully authentic and an original work, and what is discussed here is the border issue. Every design of architecture gives specific references to its predecessors and includes citations. On the other hand, Architecture exists with a fixed physical context, different from the other design works and gains meaning. This feature makes the lookalike repeat of the architectural work impossible. Same building will gain a meaning in a different context again and will be different from its predecessors or prototype. In this study, while taking attention to the difference between analogy and imitation, Analogical architecture examples and imitated buildings built in different places around the World will be comparatively analyzed.

» Keywords

Prototype, Analogical Architecture, Imitated Buildings

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- **Cornel BIȚ**

Calculation of Desired Coefficients for the Characteristic Equation of Closed Automatic Control System

» Abstract

This paper is concentrated on some microstructural and macrostructural issues concerning fatigue cracks in an aluminium alloy subjected to fatigue cycles. A diffusion process involving different manganese compounds developed within the immediate area of the fatigue cracks has been also revealed. A new fatigue crack propagation law has been proposed.

» Keywords

crack, fatigue, microstructural and macrostructural constituent, diffusion process

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- **Cornel BIȚ**

Modern Tendencies in Fatigue Investigations

» Abstract

The paper presents several fundamental tendencies concerning the new investigations in fatigue phenomenon. The problem has been focused on the two fields of understanding this phenomenon and of trying to offer the most suitable and reliable methods to model fatigue in engineering: short crack and long crack propagation domains. A modern method to get a new crack propagation law has been proposed.

» Keywords

crack, fatigue, linear elastic fracture mechanics, microstructural features

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- [Traian Eugen BOLFA](#)

Relevant Characteristics of High Speed Bearings

» Abstract

The requirements of very high performance (stress, rotational speed, stability to vibrations, etc.) for the compounds of mechanical engineering also involve an adequate reliability. The bearings can run at over 70 m/s peripheral speed of high reliability conditions (gas turbines in the aviation industry), with some high precessions and depressed frictions (gyroscopes, grinding broaches), with low/depressed noise and vibrations level. The increase of the bearings speed over the limits considered "ordinary" influences negatively the durability due to some kinematic, dynamic and lubrication significant changes. Major centrifugal forces appear, friction forces modify sensitively, starvation phenomenon occurs, and vibrations are established, too.

» Keywords

cage, starvation phenomenon in ball bearings, lubricant's viscosity, rings

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- [Traian Eugen BOLFA](#)

EHD Lubrication Working Conditions in High Speed Bearings

» Abstract

At the level of the contacts between the rolling bodies and the ring races of the bearings are, generally, accomplished the conditions of EHD lubrication working conditions. At the level of the contacts between the cage and the rolling frames, the lubrication systems vary among large limits (limited, mixed, EHD or HD conditions), while at the contacts between the cage and the guiding level prevail the mixed or HD lubrication conditions. The paper presents the theoretical and experimental importance of studying the thickness of the lubricant film and proposes methods of determining it. The diminished quantity of lubricant generates the phenomenon that determines the reduction of the film's thickness.

» Keywords

radial bearings, high speeds bearings, thickness of lubricant film

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- [Ioan ENESCU](#)

Increasing the Quality of Superfinishing and Laminate Manufacturing Process by Modeling

» Abstract

When a metal strip is passed through a rolling mill to produce an appreciable reduction. In thickness, the plastic deformation is generally large compared with the elastic deformation so that the material can be regarded as being rigid plastic. In the first instance, the elastic deformation of the rolls may also be neglected. We tried to answer to the main question: how are the elastic contact stress and deformation between curved face in contact influenced by surface roughness, and plastic deformation.

» Keywords

contact, elastic, laminate, rough, friction

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- [Adriana FLORESCU, Sorin BARABAŞ](#)

Aspects Regarding Continuous Improvement in Production Systems

» Abstract

Implementation of a modern management system covering all activities that occur within an organization must respond the major changes in the evolution of production systems, and

feature flexibility, adaptability to market needs and company needs to increase competitive advantage. Implemented in many organizations, based on the evolution of the quality concept and aiming highlighting the human potential, currently Kaizen management is considered as the system that offers the most diverse range of tools for identification, analysis, evaluation and problem solving concerning eliminating waste and reducing costs through continuous improvement process. Through literature review, this paper presents the theoretical basis of the philosophy of Kaizen, Kaizen methods of implementing the principles in any organization and Lean Production tools and their application in order to increase performance of production systems. It will present the methodology of implementation of Kaizen major concepts, especially in the field of standardization and organization of Lean Production. By applying these principles are rethinking the system, control and improve processes on the value chain, without using sophisticated tools and technologies in solving problems.

» **Keywords**

management, continuous improvement, Kaizen, production system

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- **Ana-Maria GERMAN, Mircea BOȘCOIANU**

Innovation and Business Model Prototyping in Industry Sector

» **Abstract**

In a dynamic business environment, innovation is very important for competitiveness. Prototypes serve to different purposes, both from a business and an engineering perspective. In businesses, prototypes are used for marketing research, cost analysis and to obtain customers' feedback about the aesthetics, ergonomics and theme of a product. Prototyping is used in engineering to provide manufacturing and assembly data, to investigate system integration issues and to develop analysis and testing strategies. Prototyping strategy represents the set of decisions that indicates what actions will be taken by managers to develop the prototype(s). The aim of this paper is to emphasize the importance of technological innovation, prototypes, prototypes strategies and business models in an uncertain market environment with the purpose to obtain competitive advantage and performance. The paper proposes an innovative business model that is dedicated to enterprises' managers. The business model prototyping is believed to be a source of gaining competitive advantage.

» **Keywords**

prototype, business model prototyping, innovation, competitiveness

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- **Anca N. IUGA (BUTNARIU), Nourăș Barbu LUPULESCU**

New Challenges for Circular Economy: Eco-Product Development Process and Remanufacturing Eco-Design

» **Abstract**

The article addresses the issue of using innovative high performance technology, integrated into a unitary concept for (re)manufacturing of various types of industrial products, respecting the concepts of circular economy. In our article, we focus on methods and applications of remanufacturing concepts at company and inter-company level, applied in the lifecycle management of industrial products, used as resources in circular economy. Our purpose is to find out the importance of innovative processes on product remanufacturing eco-design.

» **Keywords**

eco-product development process, circular economy, remanufacturing eco-design

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- **Anca N. IUGA (BUTNARIU), Nourăș Barbu LUPULESCU**

Applying the Principles of Circular Economy to an Industrial Trading Company by Using Balanced Scoreboard

» **Abstract**

A "circular economy" is focused on preserving the value of the materials and energy in products, used for optimal duration value chain, and therefore, minimizing waste and resource use. The ideal environment is composed of circular economy and natural environment green companies. Not all companies can adapt to new requirements circular economy. Some declare themselves as part of the green industry, but in reality do not belong to this business model. Integrated management model used by the scoreboard balanced establish efficacy and balanced single integrated management systems, using standards for sustainable success, social responsibility and economic results of the Company's industrial profile circular economy principles.

» Keywords

circular economy, the balanced scorecard, environmental management

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- **A. Saad NAJIM, Ahmed Sabah**

An Investigation of New Design of Light Weight Structure of (ABS/PLA) by Using of Three Dimensions Printing**» Abstract**

In present paper, light weight structure of (ABS/PLA) consist of honey comb core with skin layers as sandwich structure, the design includes design of the core with increasing the infill parentage of (10%, 30%, 50%, 70%, 90% and 100%) by increasing of hexagonal pores volume to test tensile strength, also includes the different between the heat and adhesive joining to prepare the sandwich structure panels for stiffness test. The samples are prepared by 3D Printing technique, type fused deposition modelling FDM and the (3D desktop printer) type of printing machine is used to conduct this work. Different mechanical and physical properties (tensile strength, stiffness, specific strength, etc.) are tested. The results show improvement of, specific strength. Tensile strength and modulus with increasing of pore size (hexagonal) reduction for tensile test samples, heat joining gives lower stiffness than adhesive joining of flexural strength test.

» Keywords

3D printing, honeycomb structure, ABS/PLA

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- **Maryam Falah NOORI, Nizar Jawad HADI, Abdulrahman Khalaf Ali**

Study the Flow Behavior of GNPs Filled Water and Polymer Using Cone-on-Plate Viscometer**» Abstract**

This work investigates the rheological behavior of gold nanoparticles filled water (GNPs-water) and filled polyvinyl alcohol (GNPs- PVA) prepared by Nd - YAG laser ablation. Noble metal GNPs were synthesized by pulsed (Q-switched, 1064-Nd: YAG, 8 ns pulse duration and energy E = 550 mJ and 650 mJ laser ablation of gold metal plates immersed in double distilled and deionized water DDDW and PVA solutions. Absorbance spectra of the produced nanoparticles solution was measured by UV-VIS spectrophotometer which show sharp and single peaks 530 nm indicating the produced Au nanoparticles with a narrow size ranging from 10 nm to 20 nm with almost spherical shape. The morphology and size was estimated by TEM for GNPs-water. The rheological behavior of GNPs filled water with particle sizes (10 nm) and (20 nm) called nano1 and nano2 and (GNPs-PVA) called nano3 and nano4 respectively were tested using cone-on-plate viscometer. The viscosity, torque, shear stress where measured at different shear rate. The results show that the shear stress increases with the shear rate increasing for nano1, nano2, nano3 and nano4. The viscosity decreased with the shear rate increasing for nano1, nano2, nano3 and nano4. The viscosity for 10 nm concentration is lower than that for 20 nm concentration due to the difference in particles size and energy value.

» Keywords

GNPs-water, polyvinyl alcohol (PVA), viscosity, flow behavior, shear thinning, cone-on-plate viscometer

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