PM-05

Proceedings of the

PM-05 > Fifth Scientific Conference on

Project Management

Advancing Project Management for the 21st Century

"Concepts, Tools & Techniques for Managing Successful Projects"

29-31 May 2010
Heraklion, Crete, Greece

Edited by
John-Paris Pantouvakis

National Technical University of Athens
Centre for Construction Innovation

- 2010 -

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Editor

John-Paris Pantouvakis

Coordinated by the

Centre for Construction Innovation (CCI)
Department of Construction Engineering & Management
Faculty of Civil Engineering, National Technical University of Athens (NTUA)
Athens, Greece

Organization & Secretariat

Frei SA Travel – Congress
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The proceedings includes a CD attached on the back cover. The CD contains the conference abstracts, the full versions of the papers and other related information. Adobe Acrobat Reader® is needed (can be installed through the CD if not present in your system). No other special installation is required.

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Athens, Greece.
May 2010

Foreword

Welcome to PM-05, the 5th Project Management (PM) Conference in the series that we have been organizing in Greece since 2001. In designing PM-05 we have integrated our experiences with most of your suggestions from previous PM conferences in order to organize the best possible event for the professional, the academic, the researcher, the student and their respective organizations.

In PM-05, our keynote speakers will set the scene for the subsequent conference sessions. Brigitte Schaden, the President of IPMA (International Project Management Association) will explain how IPMA moves forward and brings the benefits of project management to professionals and organizations. Mirek Skibniewski, Professor at the University of Maryland, USA will address the important technological issue of ERP integration in project management. Roland Gareis, Professor at the Vienna University of Economics and Business and Managing Director of RGC will provide a glance of his experience in designing project and programme performing organizations. David Pells, the managing editor of PM-Forum, will provide invaluable information on the origins, whereabouts and future aims of this very important project management portal.

In addition, PM-05 as all previous Conferences in the series, will be based upon peer reviewed papers. Academics, researchers, industrialists, professionals, policy makers and assessors, concerned with projects and programmes in every sector (construction, IT & telecommunications, public government, NGOs, international & EU funded projects etc) contributed with their knowledge and experience. You will find some ninety papers in the proceedings, authored by people originated from more than twenty countries in the five continents. These papers summarize the efforts, developments, knowledge and experiences of a wide spectrum of individuals and organizations from around the world. You will find both academic papers and professional presentations in the proceedings. PM-05 embraced both academia/research and practice/profession and more importantly aimed at the interaction of the two "worlds"!

The PM-05 will also include tutorials on specific topics. The tutorials aim at highlighting, informing and setting you thinking on important questions of relevance. For example, what is an international professional organization, such as IPMA, is doing to advance project management? What is the importance of project management certification and when and why should one aim for being awarded a project management certificate? Can we view project management differently so that it may deliver results in a decision-less environment? Finally, what are the major challenges and opportunities for project management (and project managers) in the next decade? Views, speculations, interaction and (hopefully) answers will be found at these tutorials led by renowned experts, such as the President of the IPMA, the Vice-President of IPMA for Certification, the Director of the Performance Based Studies Research Group (PBSRG) at the Arizona State University and the Vice President of the Association for Project Management (APM).

Equally, the PM-05 Conference is the ideal background to discuss the further advancement of the discipline through research and development. A PhD Workshop, led by the Director of Post Graduate Research Training at the 6-star rated University of Salford, UK will attempt to provide invaluable information and guidance.

Are papers, presentations, tutorials and workshops enough for project management? I think they are not. In managing a project, you need to make use of all information "generating" sources and of all information transfer mechanisms that may include verbal communications, interaction and tacit knowledge! How, for example, do you exactly capture the philosophy, power and simplicity of "*Bistamundi*"? In this conference, you may find that social events are particularly focusing on project managers and their respective personal advancement needs that cannot be addressed through formal learning, reading and attending of structured presentations. In addition, Crete, an island with rich history and

unique cultural heritage forms an almost ideal setting for further personal development. So, watch out for the social events of the Conference; they may be more interesting and rewarding than you may have originally envisaged…

In all, we have set up a balanced Conference with both formal papers and structured tutorials; you will gain a lot by attending the Conference and the parallel activities as we all know that information is not always easily captured in printed materials.

I really hope that you will consider the event useful to your professional and research careers and that you will find the time to discuss and exchange ideas on projects and project management with your colleagues during the conference.

This event could have never been possible without the contribution of many people; the organizer FREI SA, who looked after all organizational issues; the renowned invited speakers who took the time and put the effort to address the event; the tutorials and workshop chairs who contributed with their knowledge, acquaintances and skills; the authors and the reviewers of the papers. Many supporters for their wishful thinking and support. Appropriate acknowledgment should be made to all of the above. However, I must reserve my most heart-felt appreciation for you, the conference participants who made the whole venture possible and worthwhile. Thank you!

And if you enjoy PM-05, please have in mind that we may have even bigger and better plans for the future! The next conference in the series, PM-06 will be held in Athens, in early November 2012 in conjunction (hopefully) with the 26th IPMA World Congress. We really hope that you will book the first week in November of 2012 for a most exciting and rewarding project management event!

With best regards and wishes for a successful Conference in Heraklion, Crete and the future,

John-Paris Pantouvakis, Ph.D.
PM-05 Conference Chair,
Centre for Construction Innovation,
National Technical University of Athens
PM-Greece Association - An IPMA Member.

http://paris.pantouvakis.gr

Contents at a glance

PM-05 > *Conference Reviewers*

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Marinelli, M., National Technical University of Athens, Greece
Metallinos, P., Engineering Dept., Region of Ionia Nisia, Greece
Panas, A., National Technical University of Athens, Greece

PM-05 > Cooperating Journals

The following journals will publish selected papers from the PM-05 Conferece:

1. **Automation in Construction**, Elsevier, Editor in Chief: Professor Miroslaw SKIBNIEWSKI, Univesity of Maryland, U.S.A.

2. **International Journal of Construction Project Management** (*Vol. 3, Issue 1, March 2011*), Nova Publishers, Special issue Editor : Dr. Yiannis XENIDIS, Aristotle University of Thessaloniki, Greece.

3. **International Journal of Project Organisation and Management** (*Vol. 4, Issue 2, March 2011*), Inderscience Publishers, Special issue Editor : Dr. Kleanthis SIRAKOULIS, Lecturer, Technological Education Institute of Larissa, Greece.

4. **Built & Human Environment Review Journal**, (International Journal dedicated to postgraduate research), Open Journal Systems, University of Salford, Guest Editor: Dr. Monty SUTRISNA, University of Salford, UK.

5. **PM World Tomorrow Journal**, www.pmforum.org, Editor : Professor Dean KASHIWAGI, Arizona State University, USA.

6. **International Journal of Information Technology Project Management**, IGI Global, Special Issue Editors: Prof. Pandelis IPSILANDIS and Dr. Kleanthis SIRAKOULIS, Technological Education Institute of Larissa, Greece.

7. **Russian Project & Programme Management Journal**, Grebennikov, Guest Editor : Alexander TOVB, SOVNET & IPMA VP Certification.

PM-05 > *List of Conference Papers*

* Papers in Gray are professional presentations (Full paper has not been reviewed).

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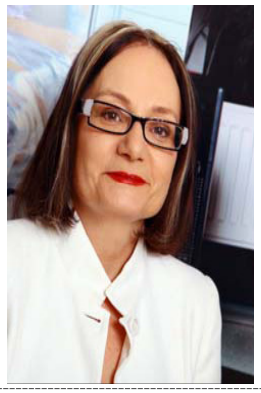
Keynote Speakers

Short presentation of the PM-05 Conference Keynote Speakers

Mag. Brigitte Schaden

President, International Project Management Association (IPMA)



Managing Director BSConsulting, President of IPMA, International Assessor of IPMA, Chairman of Project Management Austria, Assessor of the Certification Body of PM Austria, First Assessor of the Certification Bodies in Romania & Greece

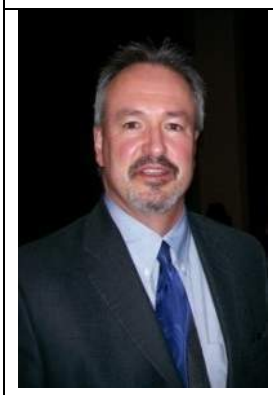
Degrees on Insurance Mathematics, University of Technology, Vienna, Computer Technology, University of Vienna, IPMA Level B.
Worked in IT in bank, insurance and international trading companies. Manager of Libro AG and Lion.cc Libro Online AG. Member of the Certification Validation Board of IPMA & Past Vice president (certification) of IPMA

IPMA .... moving forward

- Introducing IPMA (Mission, Historical Background, Membership, Excellence Awards, Events (World Congress), Research & Publications, Certification and Standards)
- The profession – project management certification. How the IPMA Certification system supports quality
- Top trends in project management, IPMA achievements and new developments

David L. Pells

Managing Editor PM World Today, PMForum, Inc., U.S.A.



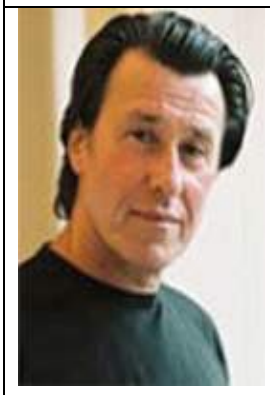
Managing Editor of PM World Today and of www.pmforum.org, one of the world's leading online sources of project management news. He is an internationally recognized leader in the field of professional project management, with over thirty years' experience in project management. His professional experience includes a wide variety of programs and projects, including engineering, construction, transit, defense and high technology, and project sizes ranging from small to mega. He advises several major organizations and programs. He served on the board of directors of the Project Management Institute (PMI®) twice, and was awarded PMI's Person of the Year award in 1998 and Fellow Award in 1999. He is also an honorary Fellow of Project Management Associates (PMA), the Indian National PM society, and of the Russian Project Management Association SOVNET. He has published and spoken widely on Project Management worldwide

PMForum - The Untold Story..."

Launched by PM visionary David Curling in Canada in the early 1990s, www.pmforum.org is the world's first and oldest website devoted to professional project management. It remains one of the world's best known and most popular sources of project management news and information. With global networks of academic and professional advisors, international correspondents, authors, ambassadors and readers, This presentation will tell the PMForum story – where it came from, how it is evolving and what the future holds. PMForum bridges the professional worlds of AIPM, APM, IPMA, PMAJ, PMI, SOVNET and other professional bodies, providing a global perspective on the state of the project management profession, current trends and the likely future. PMForum's mission remains "connecting the world of project management". This presentation will tell the story and reveal how that is possible.

Professor Roland Gareis

Vienna University of Economics & Roland Gareis Consulting, Austria



- Managing Director of Roland Gareis Consulting GmbH Vienna and Roland Gareis Consulting srl Bukarest
- Professor for project management, Vienna University of Economics and Business Administration Projekt-Management Group.
- Academic Director Professional MBA Project & Process Management, Vienna University of Economics and Business Administration.

Designing Project & Programme Organizations

- Projects (and programmes) can be perceived as comprehensive tasks, as temporary organizations, or as social systems. The perception of projects influences the way how projects are managed, how their complexity is coped with. A systemic-constructivistic project management approach will be presented. The consequences for designing project organization charts, project roles, project communication structures will be shown.
- New organizational models for projects such as empowerment are introduced to optimize project performance.
- Specifics regarding the design of programme organizations are the relationships between the project owners, project managers and the programme owner and the programme manager, the responsibilities of the programme office, programme team meetings etc.

Professor Miroslaw Skibniewski

A. James Clark Chair Professor, University of Maryland, U.S.A.

Department of Civil and Environmental Engineering at the University of Maryland. Prior faculty member at Purdue University. M.Eng. from Warsaw University of Technology, and M.S. and Ph.D. from Carnegie-Mellon University. Prior to his academic career, he worked in the industry as an engineer engaged in design quality reviews, construction related claims, value engineering, forensic engineering and industrial safety investigations.

He has received many awards including the NSF Presidential Young Investigator Award from President Ronald Reagan (1986), Honorary Professorship from Warsaw University of Technology (2005) and Moscow State Industrial University (2006). He is also a Foreign Member of the Russian Academy of Engineering. He is an author or co-author of over 150 technical publications and of more than 100 invited research presentations worldwide.

ERP Systems for Project-Based Firms: Costs, Benefits & Implementation Challenges

Enterprise Resource Planning (ERP) systems are configurable enterprise-wide information system services that integrate information and information-based processes within and across functional areas in an organization. They have been widely adopted in many organizations. This paper analyzes and presents the costs and benefits of ERP systems for project-based industries, which have lagged behind other major industries in adopting ERP systems due to their project-centric nature and the high stakes involved in ERP implementation. The challenges during the process of ERP implementations are also identified as part of the effort to understand the implied costs of an ERP system. The evidence of the costs and benefits is drawn from previous studies and the analysis of the prevailing working practices in project-based firms. The classification of the costs and benefits can be used to enable executives in project-based firms to make informed decisions on their ERP system investments.

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Abstracts

AA094

Critical Review of the Current Public-Private-Partnerships Legal Framework in Greece with Respect to Legal Risks Management

Elsa Adamantidou
(Legal Adviser of Public Procurement Monitoring Unit Rechercher in Centre of International and European Economic Law, Greece)

Yiannis Xenidis
(Lecturer, Aristotle University of Thessaloniki, Dept of Civil Engineering, Greece)

Panos Papaioannou
(Professor, Aristotle University of Thessaloniki, Dept of Civil Engineering, Greece)

Abstract
Success of Public Private Partnerships (PPPs) heavily depends on the host country's legal and regulatory framework. Legal risks are primarily connected to inefficiencies of legal agreements and documents and lack of specific and clear provisions and regulations. This paper presents an inventory of legal risks based on literature review and compares it to the current legal framework for PPPs in Greece aiming at highlighting the latter's strengths and weaknesses with regard to the management of risks. The results of the analysis indicate several strengths of the current legal framework, while the major weaknesses are the vagueness in certain cases, which allows for various interpretations and the negligence in the enforcement of laws and regulations.

AA055

A Risk Assessment and Management Framework to Support Project Delivery

Agyakwa-Baah, A. B.
(Postgraduate, Sheffield Hallam University, Sheffield, United Kingdom)

Chileshe, N.
(Senior Lecturer, University of South Australia, Adelaide, Australia)

Stephenson, P.
(Professor, Sheffield Hallam University, Sheffield, United Kingdom)

Abstract
Risk factors associated with construction projects have a major impact on issues related to cost, time and quality of project delivery. Unexpected events result in either positive or negative outcomes often causing deviations from project plans and making construction projects particularly prone to risk. Despite the extensive research on risk management in the construction industry, there is limited literature dealing specifically with project risk in developing countries. It is against this background that this study investigates the use of risk assessment and management processes in organisations. Data were collected from construction professionals working with construction clients (both private and public), consultants, and contractor organisations within the Ghanaian construction sector. The survey data were used to examine the differences in the levels of agreement between the three stakeholders. The research findings indicated that although project stakeholders are aware of risk factors associated with construction projects, there is a need for the benefits of using risk management processes to be emphasised and communicated. Based on the research findings a risk assessment and management framework was established to support future successful delivery of construction projects in developing countries.

AA086

Critical Success Factors for Risk Assessment and Management Processes Implementation: Perceptions of Construction Professionals in Ghana

Agyakwa-Baah, A.
(Postgraduate, Sheffield Hallam University, Sheffield, United Kingdom)

Chileshe, N.
(Senior Lecturer, Research Education Portfolio Leader, University of South Australia, Adelaide, Australia)

Stephenson, P.
(Professor, Sheffield Hallam University, Sheffield, United Kingdom)

Abstract
Despite the extensive research on risk management in the construction industry, there is limited literature dealing specifically with the identification of critical success factors necessary for the deployment of risk assessment and management processes in developing countries. It is against this background that this study attempts to elicit the perception of construction professionals on CSFs appertaining to risk assessment and management processes within the Ghanaian construction industry. Data was collected from 34 contractors, 46 consultants, and 23 clients (private and public) within the Ghanaian construction industry. Response data was subjected to descriptive statistics and subsequently analysis of

variance (ANOVA) and other non-parametric tests were used to examine the differences in the identification of the critical success factors. The research findings indicated that among the critical success factors, 'Management style' and 'team work and communications' were ranked as the most important whereas 'goals and objectives of the organisations' and 'customer requirements' were considered to be the least important. There was a disparity of the ranking of the 10 critical success factors among the groups; however the differences were not statistically significant. The study also established a number of managerial implications in that the identified critical success factors could be used as a 'road map' for the successful implementation of risk assessment and management processes in developing countries.

AA080

Management of Communication Risks: Evidence from international projects case study

Shaghayegh Aldaghi
(Royal Institute of Technology (KTH), Stockholm, Sweden)

Sviatlana Anop
(Research engineer, Royal Institute of Technology (KTH), Stockholm, Sweden)

Abstract
The realization of project requires collaboration between many different participants. The majority of interactions happen on the project management team level. The general believe is that teams/groups can achieve more efficiency if they use effective instruments of risk management in their communication process. The aim of this study is to investigate how the level of communication risks varies between different project group development stages and how project manager can help project group to reach the maximum effectiveness of communication. The study analyzes different communication barriers that project group meets while working at project. The investigation was performed by using qualitative analysis method in four different projects of an engineering and consulting company involved with mining industries in South Africa. Interpersonal relationships were measured by FIRO model and communication risks were evaluated by a typical risk analysis method. Results of investigations show that communication risks are directly affected by the stage of group development and different factors of group development tend to synchronize with each other. The total amount of risks tends to decrease as group moves from one stage to another on the FIRO model. For improving communication process in project groups the dynamic nature of FIRO model should be considered. The risks will not be settled down unless the group stands in "Openness" stage and the group development stage is vulnerable to any changes; the environmental effects should be carefully followed for preventive action.

W010

Evaluation of the Standardised form of contract at Sultanate of Oman

Aziz Al Rashdi
(PhD Student, School of the Built Environment, University of Salford, UK)

Monty Sutrisna
(Director of Post Graduate Research Training, School of the Built Environment, University of Salford, UK)

Abstract
The use of standardised forms of contracts has been generally considered practical and economical in the construction industry. Originally produced in the 1980s, the standardised form of construction contract for government works is the only standard contract document available and recognised for public works in the Sultanate of Oman. In Oman, government contracts for the construction of public works are required by statuary law to be fixed-price contracts awarded through competitive bidding. The standardised form of contract has never really been reviewed and updated. Unfortunately, there is limited research in the Omani construction industry particularly in the contractual management field. Based on this, a PhD research has been set up intending to evaluate the use of the standardised form of construction contract in Oman and to formulate recommendations of necessary improvement to incorporate the contemporary and future needs and trends in the Omani construction industry. This paper discusses the background and rationale of conducting the research followed by the research methodology applied in this study. The earlier stages findings are also presented followed by discussion. The paper is concluded by summarising the progress and findings so far as well as the further stages of this research guided by the findings.

AA037

Framework for Managing Complexity of Interconnections in Projects

Dimitris N. Antoniadis
(Project Manager, Carillion Ltd, London, UK)

Francis T. Edum-Fotwe
(Loughborough University, UK)

Anthony Thorpe
(Loughborough University, UK)

Abstract
Interconnections and boundaries between the various project parties have been identified as an area which requires careful consideration. Complexity is caused by interconnections and this could lead to a reduction in performance if the resulting interface is not purposefully and efficiently managed. Understanding the characteristics of complexity of interconnections, and how these affect organising projects and the management style will enable the development and implementation of innovative project actions and tools that will support the management of complexity through the respective processes. The authors present results from a study of UK construction organisations to shed more light on the influences of complexity generated by the interconnections. The results from the study have significant implications for the way project teams are put together and managed, and enabled the introduction of a framework for managing complexity of interconnections in projects.

AA058
Project Managers and Designers: Required or Enabling Cognitive Skills and Personality Characteristics

Georgios N. Aretoulis
(Res. Asst., Aristotle University, Thessaloniki, Greece)

Eleni N. Aretouli
(Post-doctoral Fellow in Neuropsychology, The Johns Hopkins University, Baltimore,USA)

Yiannis Xenidis
(Lecturer, Aristotle University, Thessaloniki, Greece)

Fevronia Z. Striagka
(Res. Asst., Aristotle University, Thessaloniki, Greece)

Glykeria P. Kalfakakou
(Professor, Aristotle University, Thessaloniki, Greece)

Abstract

This study is discussing the personality characteristics, cognitive abilities and body of knowledge that synthesize the profile of successful project managers and designers. The paper determines the principal characteristics and skills which enable engineers in the construction industry to excel either as project managers or as designers. Our hypothesis suggests that personality characteristics and cognitive abilities could potentially function as prerequisites or enablers in a career path. Behavioural characteristics and skills are identified through a series of focus groups' questionnaire surveys. Statistical analysis of the answers highlight personality characteristics and cognitive abilities. The results are then compared to findings from literature. Finally, appropriate psychometric tests are proposed in order to quantify these characteristics and skills. This methodology could standardize the selection procedures and implement similar approaches in improving and managing human resources in Greek construction industry.

AA077
Modelling as a Soft Skill for the Assembly and Usage of a Project Compendium via Sensemaking Concepts and its Software Application

Steve Armstrong
(Lecturer, The Open University, Milton Keynes, England)

Abstract
This paper takes a systems view in order to explore and illustrate the relationships between the factors and actors that have an influence upon the course of action as the project plan is realized. An understanding of the issues relating to a project's risks, requirements and resources is the basis for a successful implementation of a plan to meet the time, cost and quality criteria. So, the ability to use qualitative models would be a potential component in revising the competency baseline now that complexity has a greater influence on projects (e.g. performing project health checking). From the recent set of case studies and interviews, it is viewed that Project Compendium components can be used to manage project knowledge effectively. They help to ensure transparency, availability and accessibility of information that is a potential contribution to project success, assuming they have an adequate level of quality within the context.

AA097
Construction Superintendents need Leadership

William W. Badger
(Professor, Arizona State University, , USA)

Avi Wiezel
(Associate Professor, Arizona State University, USA)

Daniel Adams
(Graduate Student, Arizona State University, USA)

Peter Bopp
(Retired, Dupont, USA)

Abstract
This paper presents a method of profiling the leadership skills of construction field superintendents and relating these skills to the success of their project. The leadership competencies of 43 superintendents were assessed utilizing a self-evaluation "Field Construction Superintendent Questionnaire" (FCSQ) complemented by a "Project Manager Questionnaire" (PMQ) that provided an independent performance evaluation from the superintendent's project manager. Analysis of the data collected from the FCSQ and the PMQ shows significant correlation between the leadership competency levels and the job performance levels of the Field Construction Superintendents. The data collected allowed to asses the importance and need of leadership as well as management skills for superintendents. Not surprisingly, the effectiveness of management skills dominates the job performance of a construction superintendent but it is the degree of applied leadership skills that make the difference between average and exceptional performance (Great Superintendents). Participants were ranked based on their leadership scores. Interviews conducted with the participants' company executives found a 90 percent accuracy rate in the ranking when compared to performance and profits generated by the participants.

AA012
An MCDA Approach for Project Selection in Public Sector

Evangelos Bellos
(Researcher, National Technical Univ. of Athens, Greece)

Dimitra Voulgaridou
(R.A., University of the Aegean, Chios, Greece)

Konstantinos Kirytopoulos
(Assistant Professor, University of the Aegean, Chios, Greece)

Dimitrios Panopoulos
(Researcher, National Technical University of Athens, Greece)

Abstract
Effective and efficient selection of projects is a crucial issue for every organization and should be aligned with its vision and strategies. The decision making process is highly complex, especially for public organisations, as it encompasses various, often conflicting criteria. Moreover they have to consider a much larger picture than private organisations and many scholars argue that public investment decisions fall into the category of constrained optimisation problems. The present study develops and proposes an approach for the prioritization of public projects, based on the Analytic Network Process (ANP), which is further validated through a real case example concerning the project selection process of a Greek municipality. The results indicate that social and political criteria dominate the decision making process, while the ANP documents the results in such way that they can be communicated to various stakeholders, ensuring public trust and establishing a system of transparency in public administration.

AA007
Measuring Performance and Implementing Improvements (Case study)

Ioannis Bras
(Managing Director, Superior Services, Greece)

Abstract
The period between 1999-2002 a first-hand applied research was based in one of the biggest corporations in England (UK) in the Project Management field. The target was to create the suitable tools, techniques and methodologies in a practical measurable environment where departments of the company which affect the effectivity and viability of a project to be analyzed so that their effectiveness can be measured and ways and mechanisms of improvement can be found. It was decided that the start would be made from a project of a budget of € 270 million whose cause was the research and construction of a nuclear laboratory in Shellafield UK. The department initially chosen to be examined and ways of measuning effectiveness to be found, but also methodology of optimizing the services offered, was the **I**nformation Technology department since it offered its services to more than 400 engineers. The paper will cover the concept design, the methodology and tools used as well as the results of the improvements acted out in the period of two semesters when the research was held.

AA002
Effectiveness of Risk Management: Barriers and Solutions

Andy Carter
(Senior Consultant, EC Harris, Birmingham, UK)

Ezekiel Chinyio
(Senior Lecturer, University of Wolverhampton, Wolverhampton,UK)

Abstract
The effectiveness of risk management within the UK construction industry is discussed. A semi-structured questionnaire was used in collecting both qualitative and quantitative data. 113 construction professionals were sampled who included project managers, clients, quantity surveyors, and contract experts. 46 replies were received, representing a 40% response rate. The quantitative data were analysed by descriptive statistics while the qualitative data were synthesised by the content-identification of opinions made. Results of the analyses showed that most respondents use a structured approach; and manage risks throughout the different phases of a project. They also feel that the risk management process is fairly okay but some barriers were identified, e.g. making a late start, using inexperienced personnel, not fully pro-active, etc. In view of these, solutions for improvement were proffered such as providing adequate training, not circumventing some steps in the process, etc.

AA015

A Research Framework for Developing a Performance Evaluation Model for Target Cost Contracts in Construction

Daniel W.M. Chan
(Assistant Professor, Dept. of Building and Real Estate, The Hong Kong Polytechnic University, Hong Kong)

Albert P.C. Chan,
(Professor & Associate Head, Dept. of Building and Real Estate, The Hong Kong Poly Univ., Hong Kong)

Patrick T.I. Lam,
(Associate Professor, Dept of Building and Real Estate, The Hong Kong Polytechnic University, Hong Kong)

John F.Y. Yeung
(Postdoctoral Fellow, Dept. of Building and Real Estate,
The Hong Kong Polytechnic University, Hong Kong)

Joseph H.L. Chan
(Research Associate, Dept.of Building and Real Estate,The Hong Kong Polytechnic Univ., Hong Kong)

Abstract
The aims of this research study are to establish an Overall Performance Index (OPI) and to develop a performance evaluation model for projects with Target Cost Contracts (TCC) in Hong Kong. Four rounds of Delphi questionnaire survey will be launched to identify the Key Performance Index (KPIs) for TCC projects and investigate their corresponding weightings. A composite OPI will then be complied for evaluating the performance level of TCC construction projects. Quantitative Indicators (QI) and Fuzzy Quantitative Ranges (QRs) pertinent to each KPI will be determined to minimise the subjective interpretation and value judgment to enhance the reliability and practicality of the model. The proposed model is expected to be developed into an online computerised system to enable industrial practitioners to measure, assess and compare the performance levels of their own TCC projects for benchmarking purposes.

AA104

Delivering the Design Services and Other Professional Services

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Dean Kashiwagi
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Abstract
Design Services have been not meeting the value and expectations of the clients and their project managers. A research project has studied the impact of the low bid award environment on construction practices, and has proposed that designers' current practices and expectations are price based and not performance based. The authors also propose that the qualification based system is a price based system and should be replaced by a best value system which includes a best value selection process such as the Performance Information Procurement System (PIPS.) The new design model will give control and risk management capability back to designers by utilizing a weekly risk report (WRR) and the risk management plan (RMP.) The new PM model managing design firms will create transparency; will give the advantage to the higher performing professionals. The researcher interviewed over 400 designers to validate the concepts of the new designer model.

AA038

Does the use of Partnering Lead to Improved Project Performance?

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Abstract
The objective for this study is to ascertain whether the adoption of partnering and other construction best practice principles lead to improvements in the project outcomes and deliverables on UK construction projects where financing is from public funds. A series of pilot interviews are carried out with client, main and subcontractor representatives to address this question. The main findings from the pilot research are that the use of partnering is seen as having a positive impact on projects in terms of time, cost and end quality, albeit not to the levels expected. The use of partnering also leads to the project team embracing other best practice tools. However results indicate one barrier to partnering realising its full potential is the lack of trust within in the construction industry and this stops the sector fully committing to more open project relationships as best practice principles envisage.

W003

Decision Support System (DSS): A Strategic Tool for the Affordable Housing Industry

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Jason Underwood
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Abstract
The housing industry in the Developing World and for long time has suffered from underinvestment, the lack of knowhow and the lack of sufficient strategies and policies. This in turn, led to a total failure in performance, accumulative massive housing demand and underachieving. Consequently, and because of the massive growth in the world's population, especially the Islamic World, people in the poorest countries have been the most affected and forced to live in slums and shanty towns which some worldwide have millions of occupants. This research paper presents a scientific approach to assist governments and decision makers in the Islamic World setting up most sufficient and effective strategies and policies on the mega-level (country level) for the housing industry. The final outcome of this research will produce a Decision Support System Model (DSS) which could be used by decision makers to setting up holistic, realistic and achievable strategies and policies based on the scientific interpretation of the interface of the DSS Model. The DSS Model operates using five engines and one interface to identify, calculate and compare between Financial Sources (Government, PFI, International Fund and Grants) and Total Cost of several variables such as, Know How (Local and Foreign), Labour (Local and Foreign), Training (Local PM and Skilled Labour), Building Materials (Local and Import), Land (Urban and Rural). This in turn gives a clear idea to governments on their financial sources, the total cost of the whole housing project, regulation and legislations necessary and required to facilitate and support the housing industry, etc. The research methodology will consist of two parts; literature review which shed light on DSS Model in terms of definition, stages, purposes, mechanism, how it functions, etc. The second will introduce Interpretive Structural Model (ISM), which is used previously in a different stage of research to identify and prioritise Housing Industry Variables and DSS Model. Finally, the DSS Model will be examined and tested using different scenarios for validation. The findings will be stated in the concluding section.

W004

Research Methodology Explained

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Abstract
Research Methodology is one of the nightmares a researcher has to endure. It is so confusing and misleading because it is derived from philosophy. Philosophy itself is hard to comprehend and explain even by experts in the field. The reason is that philosophy was first explored in the 5th Century BC by the infamous Greek philosophers such as Aristotle, Socrates, and Plato who are regarded as the fathers of philosophy. Scholars and Experts in the field of Research Methodology have invested so much time and effort attempting to draw a clear picture of the Process of Research Methodology which is derived from Philosophy. However, most attempts or perhaps models of research are still hard to comprehend, understand and follow. In the light of this, Saunders et al (2003, 2006) have introduced great Models namely The Research Process Onion, which is widely used by researchers to justify their research. However, Saunders Research Process Onion Models (2003, 2006) can be greatly improved by including and

positioning Epistemology and Ontology on the model. This attempt will draw a clearer picture about research process and make it easier to understand and follow by researchers. The outcome of this research is expected to produce a comprehensive Research Methodology Model which is broader, clearer and links and displays the relations and hierarchy among philosophical and technical terms and domains such as Axiology, Epistemology, Ontology, Research Philosophy, Research Approach, Research Strategy, Research Choices, Time Horizons and Data Techniques.

AA113

First five years of conducting the Management in Civil Engineering group of courses within the Professional Study Programme and the Polytechnic Graduate Professional Study Programme in the Polytechnic of Zagreb

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Abstract
The Polytechnic of Zagreb organised two study programmes, a 3-year Professional Study Programme and 2-year Polytechnic Graduate Professional Study Programme, and within those study programmes it embedded a group of courses about Management in Civil Engineering. With this paper we will try to review some of the basic success indicators of that group of courses, e.g. enlisted students, finished students, average grades, etc. We will also try to review the results of the survey conducted among the students of both study programmes who took the fore mentioned group of courses. The survey regarded the student opinion on education conduction and their general grades of the study as a whole. The results will show the students general opinion about these groups of courses, and it will show that the basic success indicators point to a well balanced and concerted group of courses about Management in Civil Engineering within both study programmes.

AA093

Generation of Rework: An Organisation's Perspective

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Abstract
Rework can be taken as undesirable outcome in projects. Organisations use different approaches to respond and deal with rework during execution of projects. Some of the organisations might be well-prepared to deal with it as a part of project, whereas, others might be ignorant about it. In fact, the complexity of rework often deludes organisations which are even prepared to handle it. Understanding of the physics of rework is crucial but it needs to be first understood how organisations perceive and tackle it in real life. This paper intends to present the rework and its source that is understood at the ground level by project team members in an organisation which works with power system projects in the United Arab Emirates. A qualitative approach has been used to explore the understanding of rework in the organization. Semi-structured interviews were taken with the project team members who deal with rework practically and are interested to find proper solutions to mitigate it. The interview data were processed and assembled in terms of a theoretical framework that represents their interpretation of rework. It was found that "failure in quality" and "change from the side of customer" are the two primary sources that are responsible for generating rework in the projects. The understanding is practical but its adequacy is definitely worthwhile to be further investigated.

AA010

A computer-aided conceptual cost estimating system for prestressed concrete road bridges

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Abstract
The need for an environmentally friendly design of

modern motorways increases the construction of bridges, which has exhibited substantial overruns above estimated costs. Therefore, easy to use, inexpensive and accurate methods for conceptual cost estimating are needed. Conceptual cost estimates are made before the project's detailed plans and specifications are known and rely on the conceptual design of the project. Even though they present the lowest expected accuracy, they are used by all the key people involved in the construction process. This paper presents a computer-aided cost estimating system for prestressed concrete road bridges, which provides estimates of the material quantities and cost of all bridge elements. It relies on a database incorporating actual data collected from recently constructed bridges and exploits material estimating models already developed for bridge superstructure and foundations. The respective models for bridge piers are presented in this paper. Different configurations are devised from short to long-span bridges, accounting for the major deck construction methods and foundation systems. The system can be easily used to provide different cost estimates to the owner, designer and contractor during the project's early stages, since all the required input data consists of basic design parameters that are known during the preliminary study of each particular bridge. By allowing reliable cost estimates in a short time, the proposed computer-aided system represents a useful decision making tool.

AA074

Implementation of The Entropy Concept on Construction Projects Under Financial Constraints

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Evangelos S. Tezias
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Abstract
The paper investigates the relationship between entropy (disorder) and financially-constrained projects, through a case-study project (a highway project in Cyprus). The work builds on previous and ongoing research at the University of Cyprus and at the Democritus University of Thrace. A number of mathematical models describing the aforementioned relationship are developed, with an emphasis on the effect of financial disorder on the progress of a project. The purpose of this endeavour is to optimize the allocation of the monetary resources to the project activities in such manner that will produce a lower measure of financial entropy and a higher profit. Modelling and evaluation of the proposed method is performed by use of commercially available software. The entropy-based approach results in an optimal solution that satisfies the initially stated purpose of simultaneously reducing the level of entropy and increasing the profitability of the project.

W002

The Use of the Construction Registers to Improve the Competitiveness of Small, Medium & Micro Enterprise Contractors

Gasa B, Winston S.

Abstract
This abstract outlines the research focus aimed as demonstrating that the South African construction industry's use of the Construction Register Service (CRS), would improve the competitiveness of Small, Micro and Medium Enterprises (SMMEs). The CRS was developed by the Construction Industry Development Board (CIDB) with the intent of offering a basis for sustainable development, improved delivery, performance and empowerment. The study expands the industry's knowledge base in as far as it relates to enhanced performance and competitiveness of construction SMMEs. The research limits itself to the levels of contractors registered between grades 2 and 5 with a view to establish a benchmark for contractor competitiveness within those bands. The research's unit of study is at company level drawing from a reflection on the SMMEs active in industry. The research deals with a real problem in industry and therefore the theoretical underpinnings of an epistemologically objectivist paradigm have been employed in the study.

AA048

A review of spatial considerations in project scheduling

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Abstract
Project scheduling is considered as a study of the relations between activities and time, it is well known, however, that for certain types of projects spatial considerations (e.g. site layout, facility planning, site congestion etc) should also be taken into account. In this paper a literature investigation is performed with the purpose of indentifying all methodologies and techniques that take into account "space" as an entity in producing construction schedules and the practical implications of this approach are discussed. It is argued that it is mainly a lack of perception and not a scarcity of tools that by and large lead to spatial considerations not being taken into account in most project time schedules.

AA022

Visualising Time: a GIS Approach

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Abstract
This paper presents a methodology for visualizing in 3D the scheduling time data associated with the construction of a linear/ repetitive project. The Repetitive Scheduling Method (RSM) algorithm is used to provide the time data which then are visualized in a Geographical Information Systems (GIS) environment. A three storey building is modeled with this methodology to illustrate the applicability of the concept and to underline the benefits of the spatial and time data integration. This visual understanding of the project allows efficient schedule communication among the interested parties, although the methodology has still opportunities for improvement mainly in the field of software package integration on a single platform.

AA041

Conceptual Modeling of Cause and Effect Relationships among Crisis Elements in Projects Using Fuzzy Cognitive Maps

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Abstract
During the project lifecycle, special treatment is required for crises, which may be prompted by the sudden trigger of internal or external perturbations, or they may be generated and become self-enforcing over time until a certain threshold-limit is reached. Crisis management, therefore, emerges as an essential systematic process, inherent in project management, which involves attempts to predict or identify potential crises that an organization may encounter, take precautions to prevent them, or minimize their effects. The variety of crisis types inhibits the generation of a unified treatment of crises; instead, it is more appropriate to isolate and group the most common crisis situations and their characteristics and aim to depict the relationships between crisis causes and effects. In this work, we not only identify and verify these relationships but we also solicit the negative / positive effects between them and we assign a weight in it. To achieve this, we use the theory of Cognitive Maps (CMs) (based on qualitative reasoning) and its extension to Fuzzy Cognitive Maps (FCMs). Generally, the basic elements of a CM are simple, the concepts used are represented as nodes, and the causal relationships between these concepts are represented as directed arrows. Each arrow is characterized by a weight, a real value that indicates the effect of the causal relationship between nodes. The inputs and outputs of our model concern the basic characteristics of crisis and the ways of managing them. The main deliverable of our work is the representation, using FCMs, of the relationships between crisis triggers and impacts, and the provision of a model of cross-correlations and interactions that can forecast the crisis outcomes depending on various confrontation strategies. We deepen our modeling by analyzing all the phases in the crisis "lifecycle" and, namely, pre-crisis, main crisis, re-establishment and learning, and model their inherent relationships. The resulting model provides an explanatory overview of the project crisis management mechanisms, useful for both the theorist and the practitioner.

AA032

Two-Party Risk Assessment and Allocation Model

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Abstract
Over the past few decades, numerous research efforts have been undertaken concerning the allocation of construction risks. Nevertheless, industry participants remain concerned over the current practice of risk allocation/misallocation within construction contracting. Based on this problem, a research product that would aid contracting parties in determining how each risk can best be identified, assessed, and allocated was developed. The risk allocation model is called the "Single-Party Risk Assessment Worksheet" and is to be used internally to facilitate risk alignment within each party's organization. The results are later compared in the "Two-Party Risk Assessment Worksheet" in order to begin the cooperative assessment and allocation process. This paper presents the risk assessment tools developed and the details of the worksheets.

ITPM1

The use of Project Management Systems in Road Construction Projects
The case of the EGNATIA motorway

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Abstract
The Egnatia Motorway (670 Km) is one of the most important modern infrastructure projects for the transportation of goods between North and Central European countries with South East Europe, the Balkans and the Middle East. To handle the complexity and adverse character of the project, EGNATIA ODOS A.E. the company responsible for the administration of the project, has established a standard Project Management system which covers the whole range of project activities, i.e. Design, Construction, Supervision, Operation and Maintenance of the road. In this paper we briefly describe the individual information systems used throughout the life-cycle of the project and emphasize in the use of the Project Information System (PR.IN.S. or PIS). An overview of the company EGNATIA ODOS S.A. is provided in the beginning followed by a chart of the particular systems and software applications that were used during the various phases of the project. Among these systems, whether in-house or outsourced, a basic function that is common to almost all is the need for timely and reliable reporting that is essential for decision making. And this requirement can only be fulfilled if the data collected is accurate. To achieve this goal EGNATIA ODOS S.A. has early realized that data must be collected in the source. However, the staged implementation of disparate systems created a silo-like data structure. Same information was entered in different systems, by different people – reporting to different organizations, in different time slots. The Project Information System provides a common platform that allows for early collection of data in the source (owner) so that all subsequent users have the same data available through interfaces to individual systems.

W008

Absence of Corporate Environmental Disclosure (CED) in Libya: A Research Note

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Abstract
Corporate Social and Environmental Disclosure (CSED) was one of the main topics of argument in the literature, particularly in the 1970s and 1980s. Since the early 1990s, the emphasis has been shifted to Corporate Environmental Disclosure (CED) rather than Corporate Social Disclosure (CSD). CED practice has become a topic of investigation among accounting academic researchers in both developed and developing countries. The literature has identified that the level of practices in CED in developing countries is lagging behind the developed countries. However, it is worth mentioning that pressures for CED vary from country to country and from region to region, especially between developing and developed countries. This paper presents an in-depth investigation of group of stakeholders' perceptions towards CED in Libya and concentrates upon the absence of CED in Libya. It has identified disincentives for CED in Libya. Evidence is collected from in-depth interviews with thirty interviewees from six groups of stakeholders namely: Decision Makers, Local Government, Financial Institutions, Shareholders, Managers, and Employees. The findings suggest that there is a strong consensus between the six groups surveyed on a number of disincentives for CED.

AA082

Construction contracts, project delivery methods and roles of the project stakeholders. The case of Khalifa port project in Abu Dhabi

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Aristotelis Naniopoulos
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Abstract
The main subject of this paper is to investigate and review the main construction contracts used in international environment, the project delivery methods and the roles of the project stakeholders. The greatest part of information and data were collected with the assistance of the "Archirodon Construction (Overseas) CO. S.A.", more specifically with the assistance of the department based in United Arab Emirates (U.A.E.). The first author stayed with the aforementioned company in U.A.E. for three months in the frame of his diploma Thesis. In the case of Khalifa Port in Abu Dhabi a brief presentation of the involved "actors" is made and the role of each one is described. Responsibilities are recorded and presented, as a result of a "structured questionnaire" survey with key personnel and the contract documents analysis. It appears that in certain positions the civil engineer is spending more time on issues not purely related to the main civil engineering discipline. Particularly, working in management positions in international construction the civil engineer requires a good knowledge of financial and legal issues.

AA102
The Decision-less Environment of the Future PM

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Abstract
Project managers (PM) routinely make decisions in managing projects. Decisions are made when the project manager does not have sufficient information. Decision making increases risk, and usually forces an increase in project management, direction, and control. The future PM model is one where decisions, direction, control, and risk are minimized. Decision making will be forced to the lowest level, where the expert has been hired to minimize risk. The new model is one of observation instead of using technical expertise, and one of quality assurance rather than direction and management, and leadership based rather than information based. The new decision-less environment is being developed at the Performance Based Studies Research Group (PBSRG) at Tempe, AZ in the areas of the delivery of construction, IT, food services, sports marketing, and document control. The decision-less environment has a new contract model, a new risk model, a new outsourcing model, and a new project management model which manages a system instead of a technical function/service.

AA103
New Contract Model for Project Management

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Abstract
A new contract model has been developed which changes a project manager's (PM) responsibilities from writing and enforcing a contract, to transferring the responsibility of writing and administering the contract to the vendor. The new environment changes the PM's role from management, direction, and control, to quality assurance. Quality assurance is ensuring the vendor has a quality control and risk management plan. The new model is based on the assumption that the client cannot control the vendor through the contract. The control mechanism is deleted, and the vendor creates a contract document that minimizes risk. The contractual document, which must be approved by the client's PM and legal, includes a risk managing mechanism called the risk management plan (RMP) and a weekly risk report (WRR.) The new contractual mechanism is the expert contractor's mechanism to document and minimize risk and transactions.

AA105
Strategic Plan for the Implementation of a New PM Model

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John Savicky
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Kenneth Sullivan

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Abstract
The University of Minnesota has been implementing the best value Performance Information Procurement System (PIPS) for the last four years. PIPS uses a new project management model which transfers risk and control to the vendor, and minimizes the client's PM activities. The performance of the vendors has increased and the number of transactions has been minimized, however, many of the project managers have resisted the new PM model. The resistance of the PMs has resulted in the analysis of the strategic plan to implement the new project management model. The result of the analysis is that the strategic plan must concentrate on the development of the core team of visionaries and not on the implementation of the new PM model. The tactical plan on the mechanics of the new PM model is also required, but is not as important as nurturing the core team of visionaries who are leading the change. The strategic plan ensures the sustainability of the new PM model.

W009

Evaluating IT as Source of Competitive Advantage in Engineering and Construction Organisations

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Benny Raphael
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Abstract
Many studies have suggested that Information Technology resources do offer strategic advantages to organisations and enhance their competitiveness through efficient and cost effective delivery of the organisations' value chains. However, because most of these studies were carried out through imprecise and unstructured theoretical constructs the empirical results were equivocal. Thus, the inconsistencies in the outcomes of research on IT business value were ascribed to difficulties associated with modelling the payoffs of IT investment, mode of data analysis, industrial context, and choice of dependent variables as some of the major reasons. The paper adopts multi-theoretical concepts of process-based, resource-based views and microeconomics theory as the research framework to present a non-parametric model for evaluating the impact of information technology utilization in gaining competitive advantage in engineering and construction organisations. A pilot survey was conducted to verify the model value chain and empirically tested the concept.

AA112

PROMETHEUS *Construct*: A Societal and Environmental Responsibility Framework for Medium, Small and Very Small Construction Companies

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Iliana Adamopoulou
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Abstract
The issues of Societal and Environmental Responsibility are related to the holistic approach of Sustainable Development and remain at top level of priority for theoretical and applied research. The framework PROMETHEUS addresses these issues, oriented to Greek Medium, Small and Very Small, private owned Companies, valorising a number of elements from recognized and widely in use models of Business Excellence and frameworks for Corporate Social Responsibility. It is constructed to be friendly and easy-to-use for owners / managers of all levels of formal managerial education. In this paper a specialised version "PROMETHEUS *Construct*" of the framework is presented, targeting the sector of construction projects. The businessperson records key elements of the permanent organisation and project methods, in the form of questionnaires, and then uses the toolbox, which includes material such as charts and tables, to help him towards the goal of leading the business in continuous improvement of Economic, Social /Societal and Environmental Results.

NGO1

Guidelines and Project Management Handbook for Greek Non Governmental Organizations (NGOs)

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Abstract
"APOPLOUS" was the outcome of a project assigned

by the Coordination Committee of "the Campaign of 800 Greek NGOs", with the purpose of constructing a set of "Values for Organization, Conduct and Practice" for Greek NGOs. The main objective of the present study was to construct a comprehensive, easy-to-use project management tool for Greek NGOs, as the second add-on to "APOPLOUS". An additional objective was to facilitate Greek NGOs to be certified under the Greek ELOT 1429 & 1431-3 Standards for the "Managerial Capability of Organizations implementing Projects of Public Interest", thus ensuring their candidature for European Union co-financed Projects. The authors based their study on the latest International Competence Baseline version in use of the International Project Management Association and specifically on the Austrian and the Greek National Baselines. The guidelines and the standardised handbook contained in the add-on, were used in a pilot phase by a selected sample of NGOs and their feedback is included in the presented version.

AA064

Reengineering Project Scheduling with Knowledge Management

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Elena Rokou
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Abstract
The aim of this paper is to provide an effective method for schedule reengineering and optimisation through knowledge acquisition and corporate memory creation. The core problem of schedule development is about defining each activity's duration as well as the right dependencies among project activities. Project – oriented organisations specialised in one or more domains due to their experience can have highly accurate project schedules and thus improved efficiency. The first part of the proposed method consists of monitoring all the existing processes related to the projects execution and the corresponding knowledge acquisition through monitoring project results. The second part handles the creation of a corporate memory in the form of a schedule prototype, along with all the needed processes in order to update it after each project's completion. The paper is illustrated with a case study concerning the implementation of the method on a project in the construction sector.

AA040

PM-PEDIA: An Open-Learning, Expert-Based, Mind-Mapping Tool for Project Management Education

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Dimitrios M. Emiris
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Abstract
Efficient and coherent education in PM needs to couple the standards incorporated in systematic yet concise methodologies (such as the ICB® or the PMBOK®), with elaborated documentation, examples and evaluation tools, in order to corroborate the learning material. A challenge in this attempt is that PM an inter-disciplinary field and as such, the existing literature is vast and dispersed in various media (books, articles, internet, etc.) Bringing the knowledge elements from standards (which are mostly guidebooks) and textbooks together in a form acceptable by learners and teachers, by maintaining the completeness and integrity of scientific concepts, is a challenging task.

SPM01

Lessons Learned from the Development of a Project Management Suite

Pavlos Laoutaris,
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Abstract
The paper inquires the project of the integration of the Information Systems of a large Greek public Organisation by the development of a System aiming to interconnect these of the Organisation with the Monitoring Information System (MIS) of the Ministry of Economy, Competitiveness and Shipping. It was implemented in Athens from October 2009 until March 2010. The system consists of five sub-systems. Each one is responsible for a number of tasks and contains a large number of entities. Main objective is the process tracing, step by step, and their assessment, according to the theory and the commonly accepted procedures of project management. The first step to approach the context of the project was to briefly depict the structure, the functions and the culture of the Organisation. The following step was to list down all the project management sub-processes, as

mentioned below, and assess each one individually, using a scale from "poor" to "excellent". Project Start (Objectives, organization, environment, planning the scope, scheduling, and risk management), Project coordination, Project controlling, Resolving discontinuities and Project close down. The main conclusion is that there was not given enough effort during the start process of the project. More specifically, the selection of the project team and the risk assessment were relatively unsuccessful.

AA054

Comparative Evaluation of Project Management Standards

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Abstract
The increasing number and complexity of engineering projects require the implementation of systematic management procedures for effective project execution. Among existing project management standards, PMBOK and PRINCE2 have prevailed. PRINCE2 appears more suitable for disciplined environments with strong leadership while PMBOK may be more appropriate for organisations not emphasizing on a strong hierarchy. Such standards can be effective in large or well structured organisations but not so effective in organisations without experience, ability or motivation to invest much in project management. A guide that may be used to assist organisations in developing a project management method internally is presented. The guide is structured upon a detailed questionnaire that aims to reveal the general directions for developing a management method that meets the organisation needs, to suggest practical implementation plans and actions, to help organising the management documentation, and to provide incentives for further investigation and development. The proposed guide is flexible, directly applicable, adapted to the organisation needs, and promotes people creativity and participation.

AA067

Construction Productivity: From Measurement to Improvement

Andreas N. Malisiovas
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Abstract
The subject of productivity is one of the broadest, most complicated, and therefore vague subjects related with constructions. Much research has been done for creating techniques which can efficiently measure productivity, and even more suggestions for its improvement can now be found in related literature. This paper aims to introduce current techniques and methods for measuring construction productivity along with their critique, and potential ways to improve their use. In order for the present work to be completed, people with great experience from construction industry and academia were interviewed and an extended literature review has been conducted. The data analysis reveals some unique issues that can lead to productivity loss, and also provide engineers with the current industry and academia trends on improving productivity in constructions. The results of that research can help the engineering community understand the seriousness of the construction productivity problem, and provide engineers with techniques and recommendations to face that problem.

W005

Student Difficulties in Conducting PhD Level Research - The Aristotle University of Thessaloniki Case Study

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Abstract
The Greek academic community seems to be well informed about the problems surrounding undergraduate level studies but the unique situation of graduate programs still remains quite unknown. This paper aims to make the first step towards a valuable discussion about the unique situation of the Greek University PhD programs, and explore the quality, feasibility and general philosophy which surrounds research at the PhD level. In order to extract conclusions about the research situation in Greece, a statistical survey was conducted among doctoral students of the Aristotle University of Thessaloniki. Students were asked to express their views on the research difficulties they face, by answering multiple choice questions and also by making text comments. The data analysis reveals some unique problems in conducting doctoral research, and also illustrates the need to transform the current PhD research philosophy into an educational method more applicable to the current academic needs of Greek Universities.

W006

The Difficulty of Introducing the Main Subject of a PhD Research

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Abstract
It is widely accepted that the definition and selection of a PhD research project is a very important and complex procedure. Particularly in Greece, where PhD studies are mostly supported by private (student) funds, doctoral studies have become not only a difficult but also a very expensive process. This paper examines the Aristotle University of Thessaloniki case study in order to explore the difficulties a doctoral student has to overcome for defining and organizing a PhD research project. To extract conclusions, a survey among active doctoral students was conducted. The generated results can help us find the roots of the problem of designing and defining the subject of a PhD research. The data analysis provides findings which try to answer questions about communication issues between PhD student and supervisors, the difficulty of organizing and designing PhD research projects, and the feasibility of making one's ideal research come to life.

AA020

Assessing the Procurement Process In Greece's Construction Projects

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Konstantinos Vatalis
(Assistant Professor, TEI Kozanis, Greece)

Abstract
The aim of this research is to assess the application of recent Legislation towards sustainable procurement in Greece with special attention to the construction industry. A questionnaire survey of twenty seven experts (construction managers, industrial and academics) was carried out in order first to investigate the awareness level and the constraints of sustainable procurement practices, second to record the procurement practices implemented in the Greek construction industry third to obtain experience of the above issues concerning procurement practices in the Greek construction industry. The findings indicate that although sustainability criteria are recognised as essential their use is limited.

W011

A Multi-Faceted Approach to Construction Scheduling Research

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John-Paris Pantouvakis
(Associate Professor, Centre for Construction Innovation, National Technical University of Athens, Greece)

Abstract
Although extensive research has been conducted for the development of an algorithmic project scheduling methodology allowing optimal resource allocation and cost control, it has been realized that in real-life situations a pure analytical approach may not be enough. In the current complex and multi-cultural project execution environment behavioural and contextual issues should also been taken into account. As such, issues relating to the organizational structure, personnel training, negotiation skills and the legal, financial and political context may affect project scheduling beyond the modelling abilities of pure algorithmic approaches. To this extent, the aim of this paper is to review the effectiveness of various research methods in the construction project scheduling process. In particular, the adequacy of quantitative and qualitative research methods in issues pertaining the algorithmic formulation, behavioural issues and contextual aspects of construction scheduling is examined. Special attention is paid to the differences between the analytical formulation of the problem and human factors in the project context. It is concluded that a multi-faceted methodological approach is required consisting of both quantitative elements and qualitative ones based upon the fundamentals of social and economic sciences.

AA117

Uncertainty in Scheduling Multiple Projects

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Sergios Lambropoulos
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Abstract
Whereas there is ample research literature available on uncertainty in single projects, research on studying uncertainty in a multi-project environment is scarce. As such, this paper aims at establishing a framework for modelling uncertainty in scheduling multiple projects. The primary focus is determining the feasibility of the fuzzy set theory application in the modelling of scheduling uncertainty in the contemporary dynamic project execution environment. Issues such as duration uncertainty, resource availability and multiple project objectives are examined. It is concluded that the proposed methodology could be particularly useful in practical applications.

ITPM4

An Integrated Information System for Monitoring Construction Works

Alexander Maravas
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Abstract
There is an undeniable global tendency towards implementing centralized project monitoring with the use of advanced information systems in large projects. This trend is mandated by issues such as the geographical dispersion of projects, the numbers of contractors and the total amount of works. In this respect, the integrated information system that was utilized to monitor the construction works of the project of the Egnatia Motorway in Greece is presented. Reference is made to the software, hardware, information technology architecture, quality procedures and personnel training for the successful implementation of the system. Special mention is made to the data structures that are utilised (work breakdown structure, organizational breakdown structure, resource breakdown structure, and enterprise breakdown structure). In addition, comments are made from the experiences drawn from the implementation of the system. Overall, it is concluded that the system facilitates a central focal point for corporate scheduling and cost control.

AA046

Prediction of Earthmoving Trucks Deterioration Using Discriminant Analysis

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John-Paris Pantouvakis
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Abstract
Predicting the condition of construction equipment is a crucial matter for the building industry since it directly affects the company's investment planning thus resulting in considerable financial effects. Accurate predictions could be useful for the planning of future requirements concerning equipment maintenance, replacement or procurement as well as for ongoing earthmoving operations. Towards the above, this research implements a stochastic model based on discriminant analysis and evaluates its effectiveness. In particular, discriminant analysis is applied to data provided by two large Greek Construction Companies and attempts to classify the vehicles in several predefined condition levels, according to their characteristics of age, kilometers traveled to date and maintenance status. The results demonstrate that the performance of the prediction model is strongly dependent on the maintenance policy of the company, which forms the most substantial factor for further evaluation in the course of an effective total cost management.

SPM02

An Integrated Approach to Monitoring/Performance Assessment of Operational Programmes Co-financed by the European Union

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Konstantinos Kloudas,
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Abstract
The main aim of the present paper is to present a simple but efficient tool for monitoring schedule and absorption performance at all levels required (from the individual contract to the whole programme) in order to facilitate timely and adequate corrective actions by the implementation of European co-funded programmes and assessing the capability of the beneficiaries to implement their projects on time and on budget. The schedule and the cost (absorption) of each programme level examined (e.g. contract, project, etc.) are

integrated and recorded in a time-phased budget (performance measurement baseline). Moreover, the actual time-phased absorption is recorded during programme implementation. Based on the above, absorption and schedule performance is assessed against the set targets through the definition and use of a small number of performance indicators. According to the values of these indicators, project, programme and beneficiaries performance are classified into an adequate effectiveness (risk) scale. Results of the practical implementation and use of the method will be presented for three case studies (2 in Greece and 1 in Cyprus). This approach is easily implemented in existing Management Information Systems or in widely used project management software packages (e.g. MS Project, Oracle Primavera etc.) and does not require extensive knowledge of project management.

AA075

A New Approach to Assessing Malaysian Contractor Satisfaction Levels

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Martin Skitmore
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Abstract
The extent of poor project outcomes is a recurring issue for construction industries worldwide. One of the main causes of these and project failure seems to be the inability of contractors to provide a high level of service quality to the project team. In Malaysia, design failures have also been identified as a further contributory factor. To overcome this, different types of subjective performance measurement have been progressively developed. These approaches are typically concerned with client satisfaction, customer satisfaction, home buyer satisfaction and occupant satisfaction, but very seldom consider contractor satisfaction. This paper examines the implications of this, and what is involved in developing satisfaction measures based on contractor perception instead of the typical sole concern with client performance. As a result, other attributes such as participants' performance, business performance, project performance, external factors and contractor characteristics are also examined. Several potential attributes are derived from interviews among Malaysian contractors, namely: performance (direct attributes) and contractor characteristics (indirect attributes) that possibly influence contractor satisfaction levels. These attributes are then developed to improve the existing conceptual framework. The developed framework is expected to help the project team in performing projects more efficiently, maintaining service quality and improving relationships between participants. In addition, the findings of the paper should assist contractors enhance competitiveness, improve their image and create more job opportunities in the future.

AA111

Low Energy And Passive Housing Standards In Europe

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Abstract
Implementation of building energy ratio for new buildings resulted with a need to establish standards and certificates suitable for different building codes, geographical locations and building traditions of a specific nation or region. For Europe most highlighted energy rating indexes are "EPBD" ("Energy Performance of Building Directive"), with British version "BER" ("Building Energy Rating"), German "Energie-Pass" and Swiss "Minergie®", as well as for USA "LEED". Also well known are standards for extremely low energy buildings as "PassivHaus", "Minergie®P-Eco", "Zero Energy" and "klima:aktiv". By the directive of the European Union all the buildings on the market that are being built, sold, or rented need to be certified. Gained certificate and annual energy consumption data could be presented to anyone interested, which will intensively affect the market. This article is presenting different energy rating certificates with specific energy consumption data which enables the energy consumption comparison of different buildings. The article also presents the comparison of low energy building standards as: "PassivHaus", "Minergie®" and "LEED".

PRC1

Modelling with Uncertainty for Control Tasks

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Abstract
This study presents appropriate methods for control modelling with uncertainty for the analysis of management activities and the certification that they meet the performance standards. Dealing with and understanding the effects of uncertainty are important tasks for the project controlling. Reducing the effects of some forms of uncertainty (initial conditions, low-frequency disturbances) without catastrophically increasing the effects of other dominant forms (sensor noise, model uncertainty) is the primary job of the feedback control system. Closed-loop stability is the way to deal with the (always present) uncertainty in initial conditions or arbitrarily small disturbance. This paper outlines the methods available in the control theory and their applicability on management systems

AA014

The Relationship Between Construction Conflicts Arising Between Oil Companies and Poverty of Host-Communities in the Niger-delta region of Nigeria

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Abstract
The purpose of this paper is to examine the nature of project conflict between oil companies and host-communities in which they operate in Nigeria's oil-rich Delta region, with a particular focus on the place of poverty in fuelling the lingering conflict and the difficulty in curbing the conflictual situation. The method is essentially a review of various available relevant literature and deductive arguments that will give insights to whether poverty can be a catalyst to conflicts between oil companies and host communities. The paper concludes that poverty of host-communities to a project is usually at the heart of many project conflicts arising between operating companies and host-communities. The paper usefully points out the pervasive poverty in the Niger-delta region of Nigeria; and how poverty has continued to ignite serious conflict among all stakeholders in the region with grave consequences.

AA118

The Sustainability Dimension in IPMA Competence Baseline Contextual Elements at Project and Programme Levels

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Abstract
The objective of this paper is to open up a discussion regarding (a) the attributes of sustainability affected by the project/programme manager (PM), (b) the PM's potential for enhancing sustainability through the contextual competence elements of ICB and (c) the PM's potential for affecting the natural, social, human, manufactured and financial capitals at the project and programme levels. It is suggested that, in project/programme management, sustainability refers to three dimensions: (1) The *survivability* of the project as an operational and productive structure within a programme; (2) the *survivability* of the programme as sets of related projects; and (3) the *social acceptability* of the impacts (economic, social, cultural, and environmental) from the project's implementation process and products and the programme's evolvement. Two *study tables* are proposed as a basis for further study. T*he PM's* role in enhancing sustainability is often more crucial at the project rather than at the programme and the portfolio levels.

AA052

The Role of Health, Safety and Green Principles in Estimating Construction Productivity: An Empirical Framework

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Abstract
The current approach to construction health and safety (H&S) and green building underestimates the role of production practices and focuses mainly to the

formulation of general guidelines and best-practice policies. This paper adopts a different approach in that it integrates workers' health as expressed by their thermal comfort and environmental parameters in productivity estimation. An empirical framework is presented to evaluate the relationship of the Predicted Mean Vote index to operational efficiency. Process mapping and simulation-based analysis is used for the creation and comparative analysis of productivity models. An exemplar investigation of formwork operations illustrates the applicability of the proposed approach. The main conclusion from the study is that the implementation of the empirical framework enables the creation of foresight in planning construction operations by analysing productivity variations compared to baseline estimates. It is believed that such an approach provides a more realistic representation of construction operations and improves the accuracy of the estimating process.

W012

A Critical Review of Published Research on Construction Productivity

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Abstract
Despite the large number of published papers in the area of construction productivity, a critical review of contemporary thinking with a discussion of the implications to current researchers is rarely attempted. As such, this paper investigates the subject based upon published papers in major peer-reviewed journals during the last decade. Eighty-nine papers published in both construction journals and broader management science journals have been analysed. The research taxonomy identified three major fields: Archival studies, empirical research and simulation proposals. In terms of the methodological structure followed, three major categories have been recognized: Experimental frameworks, data collection techniques and modeling proposals. The main conclusion is that the selection of the research methodology in published journal papers has been an intuitive decision, grossly relating upon the researcher's ontological and epistemological stance. However, general guidelines on the selection of the most appropriate methodology in relation to the research objectives are also discussed herein.

AA044

Factors influencing Project Risk Management Decision Making

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Abstract
Most investment decisions are characterized by irreversibility and uncertainty about their future rewards. Understanding the nature and magnitude of cost overruns in projects is often considered to be one of the most important challenges facing project managers. The application, therefore, of Project Risk Management (PRM) is widely regarded as in important skill-set in a PM's portfolio. Today's highly volatile economic environment presents new challenges for those seeking to develop robust strategies to respond to events that are likely to impact project budgets. This paper reports on an ongoing doctoral research project in collaboration with Rolls-Royce PLC. The project aims to explore opportunities for improving the management of budget contingency in relation to effective corporate risk management strategy. Initial findings suggest that senior managers recognise the importance of an effective risk management process. However, there is a great opportunity of improving the process of how risk management data can and should be used. Two projects were studied with respect to major difference in the use of risk data. Findings indicate the importance of a top-down risk management approach. The awareness of senior managers needs to be increased. To do this, risk has to be translated into profit through budget contingency.

AA121

Collaboration Procurement Methods in Construction Projects-Greek Construction Industry Clients' Perspective

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Abstract
Traditionally the construction industry characterized by adversarial relationships, the lack of cooperation among project participants and the fact that construction companies and clients focus mainly on the reduction of project cost and neglect the value, are some reasons for the poor performance of construction projects. This research aims to investigate the Greek construction industry, from clients' perspective, in order to present the most common project delivery methods used, the problems faced, the usage of collaborative tools and the motivation factors that could lead clients to establish collaborative relationships. The empirical data were collected through a questionnaire to a population of 19 Greek Construction clients'. Findings confirm the traditional method's extensive usage in Greek construction industry both from public and private firms/organizations. As a result the problems that are reported are similar with the common problems that characterized traditional procurement method. This paper suggests that although Greek construction clients are familiar to some extend with collaboration tools and have some knowledge of the benefits of collaboration in project performance, they need strong incentives, such as cost reduction, to establish collaboration relationships.

AA045

A Framework for the Implementation of a Knowledge Management Platform in the Greek Construction Industry

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Antonios Panas
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Abstract
Contemporary construction organisations realise that managing the acquired knowledge in a more structured manner results in considerable improvements in their working practices and business performance. This paper describes a framework for establishing a knowledge management strategy for construction projects adapted to the Greek construction paradigm. A brief comparative analysis of recent knowledge management models is presented followed by a discussion of the research methodology. The study identified the informational requirements of current knowledge capture mechanisms and developed a knowledge management tool for construction projects. The tool's structure and data requirements are explained. A case study in a Greek design company helped to establish the applicability of the approach. A preliminary evaluation of the knowledge management tool by the end-users suggests that it is a useful template for the systematic capturing and storing of useful knowledge. The main inference emerging from the study is its contribution to the creation of a company-specific knowledge base for future reference, so as to solve recurring problems pertaining to the construction process.

AA033

Correlating Multiple 2D Vision Trackers for 3D Object Tracking on Construction Sites

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Abstract
Tracking methods have the potential to retrieve the spatial location of project related entities such as personnel and equipment at construction sites, which can facilitate several construction management tasks. Existing tracking methods are mainly based on Radio Frequency (RF) technologies and thus require manual deployment of tags. On construction sites with numerous entities, tags installation, maintenance and decommissioning become an issue since it increases the cost and time needed to implement these tracking methods. To address these limitations, this paper proposes an alternate 3D tracking method based on vision. It operates by tracking the designated object in 2D video frames and correlating the tracking results from multiple pre-calibrated views using epipolar geometry. The methodology presented in this paper

has been implemented and tested on videos taken in controlled experimental conditions. Results are compared with the actual 3D positions to validate its performance.

AA083

Working Cultures and Human Resources in the Construction Industry of the Balkan Peninsula

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Naniopoulos Aristotelis
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Abstract
Factors such as characteristics of the human resources, labour conditions, labour relations and others are referred to as "working cultures". The basic goal of the current paper is to identify and discuss main existing characteristics of the "working cultures" that appear in the Balkan. Moreover to consider how attractive such characteristics are for the development of construction projects in the area.
Based on the analysis, the research concluded that Balkan countries include a variety of labour "fields" under continuous evolution. A S.W.O.T. analysis (from the point of view of a foreign employer and employee) led to the conclusion that these countries appear to have interest both for the potential employer and employee.

W001

Research Methodological Position for a Doctoral Study on 'Apportioning Liability in Delay Claims'

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Abstract
Central to successful resolution of delay based claims is the fair and equitable apportioning of parties' liabilities. However, such fairness and equity in apportioning may be fettered by many factors in contemporary practices adopted by both contractors and clients. The principal goals and rationale of this research are inspired by the need to identify and curb such major obstructive factors. Thus, the research study aims to bring about contractually sound, practical improvements to problematic situations in contemporary practices. Such improvements are expected to produce more equitable, efficient, transparent and less contentious outcomes in delay claims resolution. To achieve the aim and objectives, it is considered necessary to establish a firm methodological position for the research study. This paper has strived to establish such position. In this effort, various ontological, epistemological and methodological stand points are considered. Consequently, the paper has concluded the appropriateness of using the naturalist paradigm in this study.

AA011

Factors Affecting Cost Contingency in International Projects

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Mert Duzcan
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Abstract
Contractors include a reasonable contingency amount as an allowance for potential risks in their bid, especially in international projects, in order to protect themselves against possible failures as the international construction environment is highly influenced by several complex factors such as intense competitiveness due to the existence of numerous competent rivals, unfamiliarity with the country, local conditions, and the client in question, uncertainties in the project environment, etc. The aim of this study is to identify the importance levels of the risk factors that may affect cost contingency amounts in international projects. Review of the literature indicated that there are 59 risk factors, and these factors are categorized into 6 groups, which include; bidding stage-related factors, construction-related factors, finance-related factors, country-related factors, company-related factors, and contract-related factors. Having identified and categorized these factors, a questionnaire was designed and data of 36 construction projects from 14 countries were collected for evaluation of these risk factors.

AA070

Microblogging in Project Management: Improving Project Communication and Documentation with

Status Information

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Martin Böhringer
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Abstract
Microblogging represents a significant change in enterprise communication, shifting from a push to a pull model where information consumers subscribe to relevant information sources. Especially scenarios with high degrees in information quantity and complexity may benefit from this approach. This is the case for project management, which can well be supported by microblogging tools. This paper introduces the technology's concept, motivates use cases and discusses two examples as well as available software tools.

AA076

Consulting Company Practice in Providing of Project Management Specialists by Masters Education Program

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Grigory Tsipes
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Abstract
IBS is a biggest Russian IT system integrator and consulting company - undoubted national leader in this area. As a project oriented modern consulting company it requires a large amount of advanced specialists with high level of competences in all fields of IT, consulting and management, particularly in project management. To provide such specialists IBS established its own Magistracy with Masters Education program in cooperation with worldwide known Moscow Institute of Physics and Technology (MIPT – "Fizteh") and Moscow Institute of Steel and Alloys (MISA). To meet specific requirements of IBS project and product portfolios not only the master's course on project management, but also wider context of all Masters Education program was developed. Special topics of project management are included in various disciplines of the program on information management, economy and finance, strategic and operational management etc.

AA063

Limits to professional Project Management

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Abstract
This paper considers some of the factors influencing the development of professional project management. Some important limiting factors are identified. It is intended thereby that:

- A more realistic context will be used for developing the profession
- Plans for the profession's development will be more robust
- The global cost-benefit of project management will be enhanced

The content derives from extensive relevant personal experience as well as from wide reading of relevant texts. The topic is broken down into four main elements: external, internal, inherent and future.
The paper is designed for presentation rather than as an academic record of research, although reference is made to previous publications. Although trends and limits are suggested, no firm conclusion is drawn. Rather, further consideration along similar lines is proposed.

AA016

Client's Critical Success Factors in Outsourcing of Construction Projects
Case Study: Tehran Municipality

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Abstract
To counter the competitive forces in the market, many firms re-evaluate their work by focusing on core competencies and increasing their outsourcing. Due to the project based nature of the construction industry identifying and evaluating key success factors will help top managers in implementation of successful outsourcing. These organizations primarily aim to finish their projects based on a defined scope of time, budget and quality, while accepted by the final customer. In this paper, a conceptual framework was defined based on literature review and interview with experts' panel. Key factors related to the success of outsourced project were evaluated quantitatively in

one of the largest project-based Iranian organizations, by using a questionnaire for one of their recent construction projects. Results show that successful implementation of outsourcing strategy in construction projects is strongly influenced by the level of coordination with the contractor, the contractor selection, clear project objectives, well defined technical tasks and client's top management support.

AA091

Project Management Societies and Profession

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Abstract
This paper argues that professions are a form of occupational control. Traditional professions have exercised this control based on a common acceptance of their contribution towards society. However, newer professions, including Project Management, may not share the characteristics of traditional professions but have been able to exercise occupational control by exerting power, influence and status through professional bodies and their occupational strategies. As the use of projects has grown, so too has the view that project workers may be regarded as professionals and join organisations that mimic the structure and ambitions of professional bodies. The influence project management associations can exert can be seen as unhelpful to the overall development of the discipline being seen as restrictive if not coercive. This paper examines three models from which a set of key characteristics needed to establish occupational control is drawn. The main implications for the potential of project management as a profession are centred on adjusting occupational strategy and control.

AA098

Enterprise Resource Planning Systems for Project-Based Firms: Costs, Benefits & Implementation Challenges

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Abstract
Enterprise Resource Planning (ERP) systems are configurable enterprise-wide information system services that integrate information and information-based processes within and across functional areas in an organization. They have been widely adopted in many organizations and accepted as a *de facto* industry standard for the replacement of legacy systems. This paper analyzes and presents the costs and benefits of ERP systems for project-based industries, which have lagged behind other major industries in adopting ERP systems due to their project-centric nature and the high stakes involved in ERP implementation. The challenges during the process of ERP implementations are also identified as part of the effort to understand the implied costs of an ERP system. The evidence of the costs and benefits is drawn from previous studies and the analysis of the prevailing working practices in project-based firms. The classification of the costs and benefits constitutes a cost and benefit taxonomy which can be used to enable executives in project-based firms to make informed decisions on their ERP system investments.

AA116

Standardizing of Standards in IPM of Construction

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Abstract
PM including construction nowadays crosses the borders of countries which points to the necessity to overcome borders of technical languages and culture. For it is necessary to unify the quantitive measurement properties of building materials. In the presented model standardized standards of building materials are connected with known technology of matrix coding, scanning and decoding . The model can be used in PM technology starting from the design of building in form of specification of project elements, their functions and resources bearing these functions and on the other side starting from the manufacture of producing specified resources and passing through the supply chain to the building site, including automated control by owner's supervisor. Implementing the BIM makes it possible to automatize over twenty datamation procedures in the project life-cycle.

AA073

Resource-Constrained Scheduling of Construction Projects and Simulation of the Entropy Impact on the Duration and the Cost of a Project

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Konstantinos A. Galaras
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Abstract
The paper reports on research about the relationship between project resources and the entropy generated during construction, as well as on the development of a related mathematical model. The aim is to optimize the allocation of resources in a resource-constrained project by use of an entropy metric, to study the delays which occur during the project and to relate them with the resources and the entropy in the project. Entropy is hereby defined as the disorder brought about by the fluctuation of resources in the project, and a higher entropy value relates to a higher risk in terms of schedule completion. The case study shows that a significant reduction of time (up to 25.7%) can be achieved by utilizing the entropy method for allocating resources. Furthermore, should a resource-constraint be imposed then the entropy approach results in a schedule that shows a 6.25% improvement in duration (and 8% in profit) over the solution obtained by classical scheduling methods. The reported work builds on previous and ongoing research at the University of Cyprus and the Democritus University of Thrace.

AA056

Skills and Competences of Project Managers

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Abstract
This study aims to diagnose the skills and competences profile of Project Managers in a holistic approach by utilizing a comprehensive framework (ICB–IPMA Competence Baseline Version 3.0, 2006). The Competing Values Model is adopted to operationalize Project Managers' effectiveness, as it shares wider acceptance among researchers. It is constituted from two dimensions (flexibility versus control and internal focus versus external focus), defining four quadrants that address distinct demands in the organizational arena. The Competing Values Model has also been utilised as a device for mapping organizations' leadership profiles and conducting comparative analysis. Furthermore, it may serve as a diagnostic tool, providing guidance to Project Managers in the identification of the key skills and competences that they will need to improve in order to foster individual effectiveness. This preliminary field research (the research is still on-going) is based on a structured questionnaire pilot-tested and adapted to fit to Greek reality.

AA018

Development and Prototype Application of an Oil Spill Risk Analysis in a Coastal Zone

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Abstract
This paper introduces the development of a methodology for performance of oil spill risk analysis in coastal zones through a prototype application. The main objective of the research effort is to develop the basis for a tool that can assess risks due to the occurrence of an oil spill event aiming at assisting to the risk response process. The methodology concerns the processes of probability and consequence assessment. The two processes are accomplished qualitatively with a risk prioritization based on Analytic Hierarchy Process. Being a decision-making technique, Analytic Hierarchy Process can only be used after some appropriate modifications, which transform it into a tool for prioritizing risks with respect to their probability and consequence in different oil spill scenarios. This is an approach that attempts to rationalise the risk analysis stages and to indicate the uncertainties imposed to the problem, hence creating a basis for optimization of the risk analysis results.

AA013

Analysis of Project Performance of a Real Case Study and Assessment of Earned Value and Earned Schedule Techniques for the Prediction of Project Completion Date

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Abstract
The management of a project, especially in the construction industry, is without doubt a subject of high

interest, demanding and complex and in the same time challenging and exciting. In the line process of planning-supervision-control, the last element enables the manager to determine the deviation range of actual practice from the original planning. Developing a construction schedule for a complex viaduct using the software MS Project 2007, and tracking the progress with real dates and durations, the results of Earned Value (EV) and Earned Schedule (ES) techniques are assessed regarding the duration forecasting accuracy schedule performance of a late finish project. The schedule includes complex interrelations, logistics in relation to the effective management of construction equipment and unforeseen events during the construction process. Three different scenarios are examined, from the construction of the whole bridge to a single structural element in order to assess the effectiveness of the methods, their sensitivity to re-baselining, and the contribution of critical tasks to the end result.

NGO3

Social Economy and Certification in the Context of the EQF

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Abstract
One of the economy sectors, which in the past years has been concentrating the interest of researchers is that of the social economy, contributing to the development of regions and support of groups of the population that are struggling with significant problems of unemployment. The lack of a specialized executive dynamic workforce, and especially the weakness of the typical educational system to adapt to new data and conditions, has led many individuals with insufficient typical qualifications to be active as advisors and/or educators of social economy. The present paper deals with the development of a professional profile of the advisor of social economy and an innovative method of certification of non-formal learning that responds to the directional guidelines of the EU in relation to the recognition of learning outcomes. The research that was conducted, utilizing the Delphi Method on 45 participants in 3 different EU countries revealed a necessity for the certification of informal learning in the specific field. With regards to the methodology of certification, a new, innovative method of correlation of the learning outcomes with the European Qualifications Framework is being proposed. In parallel, the need for further research in the field of social economy, and especially with regards to the methods of exploitation and integration of the suggested methodology to non-governmental organizations, is highlighted.

AA023

Predicting Cost of Prefabricated Housing Using Neural Networks

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Abstract
Political and economic pressures have become an aggravating circumstance for construction companies in achieving basic project management criteria, i.e. cost, time and scope. The construction's low performance only stresses out the need for improving current practices - especially in regard to cost. Therefore, we sought to find a critical set of variables for predicting total cost of prefabricated housing. We applied neural networks on data from more than 30 projects and thus have identify 17 critical variables for the cost prediction. The model was verified on 28 buildings with following performances: 85.7% of predicted values had the deviation lower 5%, while 10.7% had the deviation lower than 10%, in relation to the actual cost. After validating the model on data from 3 buildings, that had been new to the network, the performances were as follows: 83.8% of predicted values had the deviation lower 5%, while 12.9% had the deviation lower than 10%. Therefore this model showed to be very robust. Furthermore, this study has also demonstrated a more efficient and effective way of predicting total cost of building. Thus construction companies can influence project performance during project early phases, and acquire more competitive position on the market. Conclusion brings guidelines for use of the model and gives recommendation for its further development.

AA100

Informal Projects Management with Volunteers Participation

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Abstract
This article presents the results research conducted to identify key elements influencing the success of projects managed in informal way with volunteer participation. The data was collected from several "soft" projects. These projects included organisation of sporting, cultural, and charity events targeting large groups of people. The research involved discussing the following areas:

- roles and activities of volunteers,
- rules for employing volunteers ,
- factors influencing the success of the projects including:
  - the trust as the base of informal projects management,
  - intra-project communication,
  - cooperation
  - team work.

Project risk, reporting, execution control, and the role of project culture as elements influenced on project success were discussed.

AA028

The Greek Legal Framework on Occupational Diseases in Construction: Conformity to Risk Management Standard

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Abstract
This paper investigates the conformity of the Greek legal framework on occupational diseases in construction with the guidelines for application of risk management as described in the Project Management Body of Knowledge, a credible international standard. The aim of this research is to identify specific provisions in the Greek legal framework that require further improvement towards an effective risk management of occupational diseases. To achieve this goal, related laws and presidential decrees are analysed and their provisions are associated – based on content – to the appropriate risk management process. The identification between the levels of compliance of legal provisions with the specifications described in the standard is performed through comparative analysis. The results reveal that the current Greek legal framework addresses the issue of risk management for occupational diseases in an unsystematic and incomplete way. The research identifies certain weaknesses and makes specific suggestions towards a legal framework aligned with the respective international standard.

AA030

The Development of a Robust Resource Constrained Project Scheduling Framework

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Abstract
The literature on resource constrained project scheduling attempts to schedule projects with deterministic activity durations subject to various objective functions and possible additional assumptions. During project execution, however, a project may be subject to considerable uncertainty. Such uncertainty may lead to the actual realized activity durations to substantially deviate from the durations that were initially estimated in the baseline schedule and cause a serious project overdue. This paper offers a framework that deals with the project scheduling problem from the start of a project through to the finish, and therefore provides a whole robust project scheduling strategy which is more tolerant to various uncertainties. Our framework combines the buffer sizing technique, proactive project scheduling approach and reactive project scheduling approach, which are usually implemented at different stages of a given project. The proposed scheduling framework constructed based on these approaches is tested using a large experimental design in order to detect the effectiveness of each procedure.

AA114

Planning, Implementing and Managing Energy Efficiency Projects at Focused Local Level: The RURASU Project Successful Example and the SAVE-AGE Project Objectives

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Abstract
The effort to succeed the EU's commitment of the "20-20-20" initiative-reducing greenhouse gas emissions by 20%, increasing the share of renewable in the energy consumption to 20% and improving energy efficiency by 20%, requires multi-level actions and special projects that should be focused on specific targets. Additionally to the large-scale projects, mainly focused on RES at national level, it is important to provide support and knowledge at local level, especially in the sector of energy efficiency. Local actors and citizens outside major urban areas are often unaware of techniques and measures that could add the maximum potential gains to the overall targets in the energy sector. For this reason, Pieriki Anaptixiaki-local development agency in Greece (Pieriki) has implemented successfully several projects focused on disadvantageous categories of citizens and areas. Moreover, Pieriki is launching, under the coordination of E-zavod (Slovenia), a new transnational project focusing on strengthening energy efficiency awareness among residential homes for elderly people, under the title of SAVE-AGE.

AA095
Reformation of Local Development Agencies Seeking Conservation in their Wider Market

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Abstract
Local development agencies, acting in Greece for almost 20 years, are facing important threats for their existence; the general crisis and the specific new imposed frameworks require immediate actions. Aim of this paper is to analyse this situation and to provide information on the detailed framework that could be adapted in order to succeed conservation. The analysis method is based on actual data and on actual processes that have led to successful conservation results-results that demonstrate the actual need for reformation.

AA079
Projects for the Design of Changes

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Abstract
According to Levy and Merry (1986), changes can be differentiated into first order changes and second order changes. First order changes describe changes in few dimensions of the identity of an organization (e.g. changes in the products & services offered) that might be performed continuously and not necessarily lead to a change of the overall identity of an organization. Second order changes include changes in many dimensions (e.g. the new organizational structures of a company, including impacts on personnel, infrastructure, budget, etc.) and lead to a new paradigm, a change in the identity of a company. In the paper, change will be considered as fundamental, holistic change of an organization, and it will be further differentiated between "radical new positioning" (as consequence of a crises or chance) and "transformation". This "discontinuous" change can happen if strategic alliances are undergone, through the merger of companies, or through existential loss of market shares. Such a change has an impact to all dimensions of an organization and is of high strategic importance. The high complexity of the change demands an appropriate complexity in the design of the process. On the one side, immediate measures must be taken, on the other side, projects respectively programs as temporary organizations can be used for structuring the change.

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