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| 1. | Authors: | Ozlem Odabas, Mustafa Cem Kasapbasi | |
| | Paper Title: | Churn and Customer Segmentation Analyses with Data Mining Techniques for a Bookstore Company | |
| | <p>Abstract: Data mining, through piles of very large data is the process of obtaining meaningful data. Nowadays, rapidly developing technique. In this technique; data are grouped, classified according to the relationship, the model is created. In the last stage; the generated models reviewed. Impacts of data mining are widely used, one of the areas allocated to the customer analysis and segmentation of customers. In this study, bookstore customer groups and customer of segment showing the tendency to leave are analyzing; campaigns and marketing strategies that are appropriate to the groups identified. Classification techniques are used for Churn Analysis, clustering techniques are used for Customer Segmentation, and then the appropriate model was created. WEKA software was used to determine the model to be created.</p> <p>Keywords: Data Mining, Churn Analysis, Customer Segmentation, Classification, Clustering</p> <p>References:</p> <ol style="list-style-type: none"> 1. Rygielski C., Wang J., Yen D., "Data Mining Techniques for Customer RelationshipManagement", Technology in Society, 24:483-502, 2002. 2. Berkay M, ÇamurE,KoruM,Özkan Ö ve Rzaieva Z, " VeriKümelerindenBilgiKeşfi : VeriMadenciliği" YüksekLisansTezi 3. http://www.gurunlu.com/ 4. http://ceng.gazi.edu.tr/~ozdemir/teaching/dm/slides/10.DM.TWM.pdf 5. http://www.iszekam.net/ | | 1-6 |
| 2. | Authors: | Rena J. Kasumova, V.C. Mamedova, G.A. Safarova | |
| | Paper Title: | Phase Effects at Second Harmonic Generation in Zinc Oxide, Grown on Glass Substrate | |
| | <p>Abstract: Theoretical investigation of frequency conversion in ZnO films laid over glass substrates with account for phase effects has been developed. For this the constant-intensity approximation of fundamental radiation is applied. The numerical calculation of the efficacy obtained in constant-intensity approximation confirms the following that because of dispersion of the second order nonlinear optical coefficients the generated signal decreases for an increasing fundamental wavelength. Furthermore, the zinc oxide films generate stronger second harmonic signal because of the larger interaction length of the nonlinear medium. Method of analysis of second harmonic generation in zinc oxide, grown on glass substrate used in the present work, may be involved for research of other films.</p> <p>Keywords: nanocompo site film; glass substrate; second harmonic generation; constant-intensity approximation; frequency conversion.</p> <p>References:</p> <ol style="list-style-type: none"> 1. Ma, H.; Jen, A.K.-Y.; Dalton, L.R.; <i>Advanced Materials</i>, 2002, 14, 1339-1365. 2. Amore, Franco D; Lanata, Marta; Pietralunga, Silvia M.; Gallazzi, Maria C.; Zerbi, Giuseppe. <i>Optical Materials</i>, 2004, 24, 661–665. 3. Bagnall, D.M.; Chen, Y.F.; Zhu, Z.; Yao, T. <i>Appl. Phys. Lett.</i>, 1998, 73, 1038-1040. 4. Newmann, U.; Grunwald, R.; Griedner U.; Steinmeyer, G. <i>Appl. Phys. Lett.</i>, 2004, 84, 170-172. 5. Wang, G.; Kiehne, G.T.; Wong, G.K.L.; Ketterson, J.B.; Liu, X.; Chang, R.P.H. <i>Appl. Phys. Lett.</i>, 2002, 80, 401-403. 6. Ebothe, J.; Miedzinski, R.; Kapustianyk, V.; Turko, B.; Gruhn, W.; Kityk, I.V. XIII International Seminar on Physics and Chemistry of Solids. <i>J. of Physics: Conf. Series</i>, 2007, 79, 012001(1-8). 7. Larciprete, M.C.; Haertle, D.; Belardini, A.; Bertolotti, M.; Sarto, F.; Günter, P. <i>Appl. Phys. B</i>, 2006, 82, 431–437. 8. Kulyk, B.; Sahraoui, B.; Krupka, O.; Kapustianyk, V.; Rudyk, V.; Berdowska, E.; Tkaczyk, S.; Kityk, I. <i>J. of Appl. Phys.</i>, 2009, 106, 093102(1-6). 9. Johnson, Justin C.; Yan, Haoquan; Schaller, R.D.; Petersen, P.B.; Yang, P.; Saykally, R.J. <i>Nano Letters</i>, 2002, 2, 279-283. 10. Das, S.K.; Bock, M.; O'Neill, C.; Grunwald, R.; Lee, K.M.; Lee, H.W.; Lee, S.; Rotermund, F. <i>Appl. Phys. Lett.</i>, 2008, 93, 181112(1-3). 11. Blombergen, N. <i>Nonlinear Optics</i>, W.A. Benjamin, New York, 1965. 12. Akhmanov, S. A.; Khokhlov, R. V. <i>Problemy Nelineynoy Optiki</i> [The Problems of Nonlinear Optics], VINITI, Moscow, 1964. 13. Tagiev, Z.H.; Chirkin, A.S.; Zh. Eksp. Teor. Fiz., 1977, 73 1271-1282 [Sov. Phys. JETP, 1977, 46, 669-680]. 14. Tagiev, Z.H.; Kasumova, R.J.; Salmanova, R.A.; Kerimova, N.V. <i>J. Opt. B: Quantum Semiclas. Opt.</i> 2001, 3, 84-87. 15. Tagiev, Z.A.; Kasumova, R.J. <i>Optics and Spectroscopy</i>, 1996, 80, No. 6, .848-850. 16. Herman, W.N.; Hayden, L.M. <i>JOSA B</i>, 1995, 12, 416-427. 17. Zhang, H. Y.; He, X. H.; Shih, Y. H.; Schurman, M.; Feng, Z. C.; Stall, R.A. <i>Appl. Phys. Lett.</i>, 1996, 69, 2953-2955. 18. Blachnik, R.; Chu, J.; Galazka, R.R.; Geurts, J.; Gutowski, J.; Hönerlage, B.; Hofmann, D.; Kossut, J.; L'evy, R.; Michler, P.; Neukirch, U.; Story, T.; Strauch, D.; Waag, A. <i>Semi-magnetic Compounds</i>, 1999, 41B, 52–53, U. Rössler (Ed.) Springer-Verlag GmbH. | | 7-13 |
| 3. | Authors: | Ebenezer Komla Gavua, Seth Okyere-Dankwa, Martin Offei | |
| | Paper Title: | The Importance of Management Information Systems in Educational Management in Ghana: Evidence from Koforidua Polytechnic | |
| | <p>Abstract: There is a clear synergy between the history of education policy and the development of educational management. Initial attempts at data collection helped support the formulation of the country's national education policy. In spite of all the success chalked in the development of educational management; most educational institutions are faced with numerous challenges especially in the area of Information and Communications Technology. A study into the importance of Management Information Systems in educational management was undertaken among others to examine the role of MIS in improving educational management, examine how MIS could improve capacities in data processing, storage, analysis and the timely supply of educational information to management and administrators to enhance quick and efficient decision making. Stratified and purposive sampling techniques were the main sampling techniques employed. Interviews and Questionnaires were employed to gather</p> | | 14-18 |

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| | <p>data. Statistical Package for Social Sciences (SPSS) and Microsoft Excel were used to analyze the data. The study revealed that cost, lack of competent Information Technology Staff to man the systems, lack of computer systems and accessories and the fear of the unknown were the major problems militating against the implementation of MIS in most institutions. Recommendation were made to aid in ameliorating the challenges discovered. Staff in the institution should be taken through in-service training on the use of computers.</p> <p>Keywords: Management Information Systems, Education Management, Information and Communication Technology.</p> <p>References:</p> <ol style="list-style-type: none">1. Bloch, D., Hedberg, J.G. & Harper, B. (1994). Managing information systems in the school. <i>International Journal of Information Management</i>, 14(6), 443-464.2. Bumsted, Aee r.(1969) "The Concept of Systems Management in Educational Data Processing"3. Cambridge Education(February,2006), "Education Management Information System": a short case study of Ghana,(a working paper)4. Cambridge Education(February,2006), "Education Management Information System": a short case study of Nigeria,(a working paper)5. Charles C. Villanueva (2003),"Education management information system (EMIS) and the formulation of education for all (EFA)"6. Hoag, Ed(February,1973) "Total Information" for Oregon's schools, <i>School Management</i> (pp37-39)7. Kowitz, Gerald et al (1970), "Information for School Administration".8. Lewis,David, Alfred (1967) "Inception , Design, and Implementation of a Management Information System". Dissertation.9. Mason ,Richardo and Mitroffiani (1973), "A Program for Research on Management Information Systems" <i>Management Science</i>".10. McCain, k., Ntuen, c.a. & Park, e.h. (1996). "Software Useability as a Foundation for Human-computer Interaction Designs. In c.a. Ntuen&e.h. Park (eds.), <i>Human Interaction with Complex Systems: "Conceptual Principles and Design Practice</i> (pp. 73-87). Norwell, ma, USA: Kluwer academic.11. Mellor, Warren (December, 1973), "Management Information System",<i>Educational Management Review Series Number 25</i>. O'brien, J (1999). "Management Information Systems"12. O'Mahony, C.D. (1997). Information systems effectiveness and organizational culture Phillip K. Pielle et al "Educational Management Information Systems": Progress and Perspectives.13. Power, D. J. (2002.), <i>Decision Support Systems: Concepts and Resources for Managers</i>, Greenwood/Quorum.14. Rockart, J.F. (1979, mar/apr). "Chief Executives Define Their Own Data needs". <i>Harvard Business Review</i> 57, 81-93.15. Smith,Robert (1970),Editor "Management Information Systems for the 1970s.Technology-Application Research".16. Tom Cassidy (PhD) (January, 2005) "Education Management Information System (EMIS) development in Latin America and the Caribbean: Lessons and Challenges".17. Thimbleby, H. (1993). "User Needs in Human Interface Standards". In c.d. Evans, B.L. Meek & R.S. Walker (eds.)18. Visscher, A.J. (1997). "Facilities for Computer-Supported Decision-Making in Schools: Explanations for Lack of Use and Proposals for Improvement."19. Visscher, B.Z. Barta& D.C.B Teather (eds.), <i>Information Technology in Educational Management for the Schools of the Future</i> (pp. 57-62). Oxford: Chapman & hall. | | | | | |
| | <table><tr><td>Authors:</td><td>Parminder Kaur</td></tr><tr><td>Paper Title:</td><td>ROMCOB - Reduced Overhead and Memory Consumption on Base Station with Improved LEACH Protocol for Clustered Wireless Sensor Networks</td></tr></table> | Authors: | Parminder Kaur | Paper Title: | ROMCOB - Reduced Overhead and Memory Consumption on Base Station with Improved LEACH Protocol for Clustered Wireless Sensor Networks | |
| Authors: | Parminder Kaur | | | | | |
| Paper Title: | ROMCOB - Reduced Overhead and Memory Consumption on Base Station with Improved LEACH Protocol for Clustered Wireless Sensor Networks | | | | | |
| | <p>Abstract: Wireless Sensor Networks (WSNs) are gaining popularity with each passing day because of their wide range of applications [1]. WSNs consist of sensor nodes, which are small in size and have wireless communication capability [2]. To increase the efficiency of the network, the sensor nodes are grouped in the form of Cluster, such a network of clusters is known as Clustered Wireless Sensor Network. In Clustered WSN, the base station keeps and maintains the record of all the sensor nodes in the network hence the load on the base station is more than any other sensor node in the network. This paper attempts to reduce the workload of base station, reduce memory consumption and maintains secure connectivity by using the concept of Exclusion Basis System (EBS) matrix. The paper is organized in five sections. Section I & II gives the overview of background and literature review. Section III explains the system architecture which gives the description of proposed scheme. Section IV describes the performance evaluation. Section V explains the future scope.</p> <p>Keywords: WSN, Exclusion basis system, Key management, secure group communication.</p> <p>References:</p> <ol style="list-style-type: none">1. Reza Azarderakhsh, Arash Reyhani-Masoleh, and Zine-Eddine Abid. "A key management scheme for Clustered wireless sensor networks", <i>IEEE/IFIP, International Conference on Embedded and Ubiquitous Computing</i>, 2008.2. Mohamed F. Younis, Senior Member, IEEE, Kajaldeep Ghuman, and Mohamed Eltoweissy, Senior Member, IEEE, "Location-Aware Combinatorial Key Management Scheme for Cluster Sensor Networks", <i>IEEE Trans. on Parallel and Distributed Systems</i>, Vol.17, No.8, August 2006.3. Li Zheng, Wei Guoheng, and Waang Ya. "Key-management scheme based on identity and cluster layer in wireless sensor network", <i>IEEE workshop on Advanced reasearch and Technology in Industry Applications (WARTIA)</i>, 2014.4. Rong Jiang, Jun Luo, Fang Tu, and Jin Zhong, "LEP: A Lightweight Key Management Scheme based on EBS and Polynomial for Wireless Sensor Networks", <i>International Conference on Signal Processing, Communications and Computing (ICSPCC)</i>, 2011.5. Ian Akyildiz, Weilian Su, Yogesh Sankarasubramaniam, and Erdal Cayirci. "A survey on sensor networks" <i>IEEE Communications Magazine</i>, vol. 40.6. Rabia Riaz, Arshad Ali, Ki Hyung Kim, H. Farooq Ahmad, and Hiroki Suguri, "Secure dynamic key management for sensor networks" <i>IEEE</i> 2006.7. Kamal Kumar, A.K. Verma, and R.B. Patel, "Framework for key management scheme in heterogeneous wireless sensor networks", <i>Journal of emerging technologies in web intelligence</i>, vol. 3, no. 4, November 2011.8. Olutayo Boyinbode, Hanh Le, Audrey Mbogho, Makoto Takizawa, and Ravi Poliah, "A survey on clustering algorithms for wireless sensor network", <i>13th International Conference on Network-Based Information Systems</i>, 2008.9. I.F. Akyildiz et.al., "Wireless Sensor Networks: a survey, computer networks", vol. 38, pp. 393-422.10. S. Tanenbaum, <i>Computer Networks</i>, 4th ed. NJ: Prentice Hall.11. W. Stallings, <i>Cryptography and Network Security-Principles and Practices</i>, 3rd -ed. Upper Saddle River, NJ: Prentice Hall.12. Minghui Shi and Xuemin Shen, Yixin Jiang and Chuang Lin, "Self-healing group-Wise Key Distribution Schemes with Time-Limited Node Revocation for WSN", <i>IEEE Wireless Communications</i>, October 2007.13. D. Djenouri, L. Khelladi, and N. Badache, "A survey of security issues in mobile ad hoc and sensor networks," <i>IEEE Commun. Surveys Tutorials</i>, vol. 7, pp. 2-28, 2005. | | | | | |

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19-23

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|--|--|-------|
| | <p>14. Ossama Younis, Marwan Krunz, and Srinivasan Ramasubramanian, "Node clustering in wireless sensor networks: Recent developments and deployment challenges", IEEE Network, May/June 2006.</p> <p>15. Johnson C. Lee, Victor C. M. Leung, Kirk H. Wong, Jiannong Cao, and C. B. Chan, "Key management issues in wireless sensor networks: current proposals and future developments", IEEE wireless communications, pp. 76-83, October 2007,</p> <p>16. R.C. Johnson. Sandia enlists MEMS for anti-terror systems. EE Times, March 2002. URL http://www.eet.com/at/news/OEG20020514S0033.</p> <p>17. G. Boone. Reality mining: Browsing reality with sensor networks. Sensors, vol. 21, no. 9, September 2004. URL http://sensorsmag.com/articles/0904/14/main.shtml.</p> <p>18. J. Kloeppel. Smart bricks could monitor buildings, save lives. News Bureau, University of Illinois at Urbana-Champaign.</p> <p>19. Intel Corporation. Intel Research–Exploratory Research–Deep Networking. http://www.intel.com/research/exploratory/heterogeneous.htm</p> <p>20. B.J. Feder. Wireless Sensor Networks Spread to New Territory. The New York Times, July 2004. URL http://www.nytimes.com/2004/07/26/business/26sensor.html.</p> <p>21. K. Mayer. Instrumenting cattle – real time health monitoring of cattle using wireless technologies. Poster for Sir Mark Oliphant Conference 2004 "Converging Technologies for Agriculture and Environment", August 2004. URL http://mobile.act.cmis.csiro.au/kevin/smartsensors2004.pdf</p> <p>22. Alan Mainwaring, David Culler, Joseph Polastre, Robert Szewczyk, and John Anderson. Wireless sensor networks for habitat monitoring. In Proceedings of the 1st ACM international workshop on Wireless sensor networks and applications, pages 88–97. ACM Press, 2002. ISBN 1-58113-589-0.</p> | |
| | <p>Authors: Suresha Gowda M. V, Ranganatha S, Vidyasagar H. N.</p> <p>Paper Title: Basic Studies on the Role of Softer Metallic Coatings in Ball Bearings</p> <p>Abstract: The performance, reliability and load transferring capabilities of bearing elements are very important in industrial applications. The newer design of high speed machines demands better bearing system. The reliability is of primary importance in case of bearing elements used in aerospace industries. Exhaustive studies have been carried out by different researchers under two extreme conditions. One is using a fluid as lubricants which do not bear shear loads. The other extreme were using hard coatings which bears enormous amount of shear loads. In the present investigation an attempt has been made to understand the kinematics of deformation of coatings which are not as hard as conventional coatings. Casehardened carbon steel balls were coated with tin, zinc and nickel by electroplating technique. The thickness of the coating was maintained at 25 µm. Four ball test rig was used to simulate the field conditions. The experiments were conducted without lubricants. The normal loads were 100N, 300N and 500N respectively and run for a period of 5 minutes. The frictional load and normal load were monitored and co-efficient of friction was estimated. The wear scar was studied under scanning electron microscope. The co-efficient of friction was found to be dependent on normal load and type of coating material. The co-efficient of friction was found to be minimum of value 0.28 for a maximum normal load of 500N for tin coating. The morphology of wear scar studied in scanning electron microscope explains the dependency of co-efficient of friction on normal load and different coating materials.</p> <p>Keywords: Rolling contact fatigue, four ball tester, Coatings.</p> <p>References:</p> <ol style="list-style-type: none"> 1. R. Ahmed, M. Hadfield, Wear 203/204 (1997) 98–106. 2. Makela, P. Vouristo, M. Lahdensuo, K. Niemi, T. Mantyla, Proceedings of the 7th International Thermal Spray Conference, Boston, Massachusetts, 20–24 June 1994, pp. 759–763. 3. M. Faraday, Philos. Trans. R. Soc. 147 (1857) 145. 4. K. Kirner, ,Schweissen Schnieden 41 (1989) 583–586. 5. M.E. Vinayo, F. Kassabji, J. Guyonnet, , J. Vac. Sci. Technol. A3 (1985) 2483–2489. 6. J. Nerz, B.A. Kushner, A.J. Rotolico, Proceedings of the Thermal Spraying Conference, Essen, Germany, 29– 31 August 1990, pp. 47–51. 7. M.P. Subrahmanyam, M.P. Srivastava, R. Sivakumar, Mater. Sci. Eng. 84 (1984)209–214. 8. R. Nieminen, P. Vouristo, K. Niemi, T. Mantyla, G. Barbezat, Wear 212 (1997) 66–77. 9. R. Ahmed, M. Hadfield, Tribol. Int. 30 (1997) 129–137. 10. R. Ahmed, M. Hadfield, Surf. Coatings Technol. 82 (1996) 176–186. 11. R. Ahmed, M. Hadfield, Wear 230 (1999) 39–55. 12. S. Tobe, S. Kodama, H. Misawa, Proceedings of the National Thermal Spray Conference, Tokyo, Japan, 1990, pp. 171–178. 13. R. Ahmed, M. Hadfield, Proceedings of the International Thermal Spray Conference, Singapore, ISBN 0871707373, 2001, pp. 1009–1015. 14. M. Yoshida, K. Tani, A. Nakahira, A. Nakajima, T. Mawatari, Proceedings of ITSC, Kobe, May 1995, 1992, pp. 663–668. 15. R. Ahmed, M. Hadfield, Wear 209 (1997) 84–95. 16. Nakajima, T. Mawatari, M. Yoshida, K. Tani, A. Nakahira, Wear 241 (2000) 166–173. 17. S. Kuroda, T. Fukushima, S. Kitahara, Proceedings of the International Thermal Spray Conference, Orlando, OH, 1992, pp. 903–909. 18. T. Morishita, E. Kuramochi, R.W. Whitfield, S. Tanabe, Proceedings of the International Thermal Spray Conference, Orlando, OH, 1992, pp. 1001–1004. 19. O.C. Brandt, J. Therm. Spraying 4 (1995) 147–152. 20. G.R. Millar, L.M. Keer, H.S. Cheng, Proc. R. Soc. London, Ser. A 397 (1985) 197–209. 21. T.A. Harris, Rolling Bearing Analysis, 3rd ed., Wiley, New York, 1991, p. 23. 22. H.S. Cheng, T.P. Chang, W.D. Sproul, Proceedings of the 16th Leeds–Lyon Symposium, Elsevier, 1990, pp.81–88. 23. R. Thom, L. Moore, W.D. Sproul, T.P. Chang, Surf. Coatings Technol. 62 (1993) 423–427. 24. O. Knolek, B. Bosserhoff, A. Schrey, T. Leyendecker, O. Lemmer, S. Esser, Surf. Coating Technol. 54/55 (1992) 102–107. 25. L. Rosado, V.K. Jain, H.K. Trivedi, Wear 212(1997) 1–6. 26. I.A. Polonsky, T.P. Chang, L.M. Keer, W.D. Sproul, Wear 208 (1997) 204–219. 27. Petrov, L. Hultman, U. Helmersson, J.E. Sundgren, J.E. Greene, Thin Solid Films 169 (1989) 299–314. 28. Suresha Gowda M. V., Vidyasagar H. N., Ranganatha S, IJRTE, Vol 4 Jan 2016, 1-8. | 24-31 |
| | <p>Authors: Himangi Pande, M. U. Kharat</p> <p>Paper Title: Performance Analysis and Comparison of Modified SMAC and WiseMAC with Adaptive MAC for WBAN Applications</p> <p>Abstract: Wireless Communication and Wireless Networking is the popular research in this era. The combination of this is useful method for one step ahead to increase the life of human being. The motto of the research is to implement the protocol on Data-Link Layer, which is the WBAN stack protocol layer architecture, use to increase the life time of battery by energy saving. The novelty in the proposed method is to reduce energy consumption using</p> | 32-35 |

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| | <p>the concepts of contention window which is adaptive to the different traffic conditions. The experimental result shows increase in Total Remaining Energy, Common Node Energy, Cluster Head Energy and BAN Coordinator Node Energy of Wireless Body Area Network. The proposed protocol is simulated in NS2 environment.</p> <p>Keywords: Wireless Body Area Networks, Media Access Control, Micro Electro Mechanical Systems, Personal Digital Assistance</p> <p>References:</p> <ol style="list-style-type: none">1. W. Ye, J. Heidemann, and D. Estrin. An energy efficient mac protocol for wireless sensor networks. In 21st International Annual Joint Conference of the IEEE Computer and Communications Societies (INFOCOM'02), New York, NY, USA 2002.2. T. van Dam and K. Langendoen. An adaptive energy efficient mac protocol for wireless sensor networks. In 1st ACM Conference on Embedded Networked Sensor Systems (SenSys), pages 171–180, 2003.3. Sha Liu, Kai-Wei Fan and Prasun Sinha , “An Energy Efficient MAC Layer Protocol Using Convergent Packet Forwarding for Wireless Sensor Networks”, IEEE SECON,2007.4. J. Polastre, J. Hill, and D. Culler, Versatile low power media access for wireless sensor networks. In The Second ACM Conference on Embedded Networked Sensor Systems (SenSys), pages 95–107, November 2004.5. M. Buettner, G. V. Yee, E. Anderson, and R. Han. X-mac: A short preamble mac protocol for duty-cycled wireless sensor networks. In Proc. Sensys'06, 2006.6. El-Hoiydi, A.; Decotignie, J.-D, “WiseMAC: An Ultra-Low Power MAC Protocol for Multi hop Wireless Sensor Networks”, First International Workshop on Algorithmic Aspects of WSN, 2007, pp – 18 -31.7. Philipp Hurni, Torsten Braun, “Increasing Throughput for WiseMAC”, IEEE/IFIP WONS 2008, Garmisch-Partenkirchen, Germany, January 23 - 25, 2008, pp -1-128. Philipp Hurni and Torsten Braun, Universität Bern, “Evaluation of WiseMAC on Sensor Nodes”, Wireless and Mobile Networking, IFIP International Federation for Information Processing, Volume 284, 2008, pp 187-198.9. El-Hoiydi and J.-D. Decotignie, “WiseMac: An Ultra-Low Power MAC Protocol for the Downlink of Infrastructure Wireless Sensor Networks”, Computers and Communications, 2004. Computers and Communications, 2004. Proceedings. ISCC 2004. Ninth International Symposium, 1, pp - 244 – 251.10. El-Hoiydi, J.-D. Decotignie, C. Enz and E. Le Roux, “Wise-MAC: An Ultra-Low Power MAC Protocol for the WiseNET Wireless Sensor Network”, in the Proceedings of the Ninth IEEE Symposium on Computers and Communication, ISCC'04, Alexandria, Egypt, June 2004, pp–302-303.11. Philipp Hurni and Torsten Braun, Markus Anwander, “Evaluation of WiseMAC and extensions on wireless sensor nodes”, Telecommunication Systems, February 2010, Volume 43, Issue 1-2, pp 49-58.12. Haigang Hu,Jie Min,Xiaodong Wang,Yu ZhouAn improvement of S-MAC based on dynamic duty cycle in wireless network sensor network,2011 IEEE.13. http://www.memsic.com/products/wireless-sensor-networks/wireless-modules.html14. NS 2, Network Simulator, http://www.isi.edu/nsnam/ns/ns-build.html15. http://www.mannasim.decc.ufmg.br/download.htm | | | | | |
| | <table><tr><td>Authors:</td><td>Mark Obegi Kenyatta</td></tr><tr><td>Paper Title:</td><td>Exploring Into the Factors That Cause Payment Defaults: a Perspective of the Payment Dispute Cases in the Kenyan Construction Industry</td></tr></table> <p>Abstract: Regular and timely payment is an important feature of the construction industry. Therefore failure to pay one or several certificates or invoices, paying in installments and sometimes not paying at all will undoubtedly cause cash flow hardships to those involved and may even bring the project work to an end. This study explores the factors that cause payment default in building and civil Engineering projects in Kenya. Primary document analysis of payment dispute cases lodged in the commercial courts in Kenyan was adopted. The study establishes that inadequate funding, variations, disagreements on the value of work done and defective work are the main factors that lead to payment default in their various forms. The study not only creates but also enhances awareness to all construction stakeholders in matters payment. It is therefore hoped that the awareness created will reduce the prevalence of payment default problems in the construction industry of Kenya.</p> <p>Keywords: Payment, cash flow, construction industry of Kenya</p> <p>References:</p> <ol style="list-style-type: none">1. Abdul-Rahman, H., Wang, C., Takim, R., & Wong, S. (2011). Project schedule influenced by financial issues:Evidence in construction industry. Scientific Research and Essays, 6(1), 205-212. Retrieved 2013 йил 5-12 from http://www.academicjournals.org/SRE2. Abidin, A. (2007). The Profiles of Construction Disputes. KualaLumpur: Unpublished Masters Thesis.3. Abidin, A. B. (2007). The Profile of Construction Disputes. Kulalumpur: Unpublished Masters Thesis.4. Ameer, A. N. (2006 йил 3rd Quarter). A “Construction Industry Payment and Adjudication Act: Reducing Payment-Default And Increasing Dispute Resolution Efficiency In Construction. Master Builders Jounal, 3-14.5. AngSuSin, T. (2007). Payment issues - the present dilemmas of malaysian construction industry. kuala lumpur: Univeristi Teknologi Malaysia Istitutional Repostory.6. Ansah, S. K. (2011). Causes and Effects of Delayed Payments by Clients on Construction Projects in Ghana. Journal of Construction Project Management and Innovation, 1(1), 27 - 45.7. Ashworth, A. (2012). Contarctual Procedures (6 ed.). Pearson Education Limited.8. Aswa Developers and Contractors Limited V Compact Freight Systems Limited (2012).9. Board of Governors Ng'iya Girls High School v Meshack Ochieng' t/a Mecko Enterprises (2014). Retrieved 12 21, 2014, from http://www.kenyalaw.org10. Bryman, A. (2012). Social research methods (4 ed.). New York: Oxford University Press.11. Centurion Engineers & Builders Ltd. v Kenya Bureau Of Standards (2014).12. China Sichuan Corporation for International Techno-Economic Co-Operation v Kigwe Complex Ltd (2013).13. China Wu Yi Co. Ltd V Edermann Property Ltd & 2 Others (2013).14. Chitkara, K. K. (2011). Construction Project Management - Planning,Scheduling & Control (2 ed.). New Delhi: Tata McGraw-Hill.15. CIDB. (2010). Delayed Payments in the Construction Industry. Johannesburg: Construction Industry Development Board of South Africa.16. Cooke, B., & Williams, P. (2009). Construction Planning, Programming and Control (3 ed.). Oxford.: Blackwell.17. Cooper, D. R., & Schindler, P. S. (2014). Business Research Methods,Twelfth Edition (12 ed.). New York, USA: McGraw-Hill/Irwin Series.18. Cunningham, T. (2013). Will the construction contracts bill improve subcontractor cash-flow? Retrieved 2013 йил 1-December from http://arrow.dit.ie/beschreoth/1019. D. Manji Construction Limited v C & R Holdings Limited (2014). | Authors: | Mark Obegi Kenyatta | Paper Title: | Exploring Into the Factors That Cause Payment Defaults: a Perspective of the Payment Dispute Cases in the Kenyan Construction Industry | |
| Authors: | Mark Obegi Kenyatta | | | | | |
| Paper Title: | Exploring Into the Factors That Cause Payment Defaults: a Perspective of the Payment Dispute Cases in the Kenyan Construction Industry | | | | | |

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| 20. | Danuri, M. S., Munaaim, C. M., Rahman, A. H., & Hanid, M. (2006). Late and Non Payment Issues in the Malaysian Construction Industry- A Contractor's Perspective. Sustainable Development through Culture and Innovation, The Joint International Conference on Construction Culture, Innovation and Management (CCIM), 613-623. |
| 21. | Fong, L. C. (2005). The Malaysian Construction Industry - The Present Dilemmas of Unpaid Contractors. Master Builders Journal, pp. 80-82. |
| 22. | Graham, D. (2006). Managing Residential Construction Projects - Strategies and Solutions. McGraw-Hill. |
| 23. | Hamzah, A.-R., Chen, W., S, M.-D. M., & Che-Munaaim, E. M. (2014). Cause, Effect and Reaction for Late-payment and Nonpayment Issues in Malaysian Building Sector. Journal of Business Management and Innovations, 1(1), 8-20. |
| 24. | Harris, F., & McCaffer, R. (2006). Modern Construction Management (6 ed.). Oxford: Blackwell. |
| 25. | Hasmori, M. F., Ismail, I., & Said, I. (2012 йил 12-13-March). Issues of Late and Non-Payment Among Contractors in Malaysia. International Conference On Business And Economic, 82-93. |
| 26. | Highway Furniture Mart Limited v Permanent Secretary Office of The President & another (2006). |
| 27. | Jared Oduor Osodo T/A Jaredo Building Construction V Ben Gakere Nyutho (2010). |
| 28. | Kundan Singh Construction International Limited v Bank of Africa Kenya Ltd & another (2015). |
| 29. | Latham, M. (1994). Constructing the Team. UK: HMSO. |
| 30. | Laxmanbhai Construction Ltd V Kihingo Village (Waridi Gardens) Ltd & 2 Others (2012). |
| 31. | Maritz, M. J., & Robertson, D. C. (2012). What are the legal remedies available to contractors and consultants to enforce payment? Journal of the South African Institution of Civil Engineering, 54(2), 27-35. |
| 32. | Marx, H. J. (2012). Construction Industry Indicators Affecting Contractors. Journal for the Advancement of Performance Information and Value, 4(1), 119-132. |
| 33. | Marx, H. J. (2014). Results of the 2014 Survey of the CIDB Construction Industry Indicators. University of the Free State. |
| 34. | Mbachu, J. (2011). Sources of contractor's payment risks and cashflow problems in the New Zealand construction industry: Project team's perceptions of the risks and mitigation measures. Construction Management and Economics, 29(10), 1027-1041. |
| 35. | Mbiti, T. K. (2008). A System Dynamics Model of Construction Output in Kenya. Melbourne: Unpublished Phd Thesis. |
| 36. | Mofokeng, T. G. (2012). Assessment of the Causes of Failure among Small and Medium sized Construction Companies in Free State Province. Johannesburg: Unpublished Masters Thesis. |
| 37. | Murdoch, J., & Hughes, W. (2008). Construction Contracts: Law and Management (4 ed.). London: Taylor and Francis. |
| 38. | Nanchang Foreign Engineering Company (K) Limited v Easy Properties Kenya Limited (2014). |
| 39. | NCASL. (2008). Report on payment delays in Sri Lankan Construction Industry - Prepared by: National Construction Association of Sri Lanka (Southern Branch). National Construction Association of Sri Lanka(Southern Branch). |
| 40. | NESC. (2014). Credit guarantee schemes: The road to expanding business and investment in Kenya. Nairobi: National Economic and Social Council with support fro USAID Kenya. |
| 41. | Ramachandra, T. (2013). Exploring Feasible Solutions to Payment Problems in the Construction Industry in New Zealand. Auckland University of Technology. Auckland: AUT. Retrieved September 2, 2014, from http://hdl.handle.net/10292/5554 |
| 42. | Ramachandra, T., & Rotimi, J. O. (2011). The Nature of Payment Problems in the New Zealand Construction Industry. Australian Journal of Construction Economics and Building, 11(2), 22-33. |
| 43. | Rich Field Engineering Limited V Syneresis Limited (2012). |
| 44. | Sigma Engineering Company Limited V Attorney General (2011). |
| 45. | Silverman, D. (2010). Doing Qualitative Research (3 ed.). SAGE. |
| 46. | Thomas, R., & Wright, M. (2011). Construction Contract Claims (3 ed.). Hampshire: PALGRAVE MACMILLAN. |
| 47. | Tolson, S. J. (2004). Payment, abatement and set-off. (pp. 1-24). UK: Fenwick Elliott. |
| 48. | Tran, H., & Carmichael, D. G. (2013). A contractor's classification of owner payment practices. Engineering, Construction and Architectural Management, 20(1), 29-45. |
| 49. | True North Construction Limited v Kenya National Highways Authority (2014). |
| 50. | Uff, J. (2009). Construction Law (10 ed.). London: Thomson Reuters. |
| 51. | Unispan Limited v African Gas & Oil Limited (2014). |
| 52. | Wahome, G. W. (2014). Influence of Public Procurement Oversight Authority's Standard Tender Document on Public Building Projects in Kenya. Nairobi: Unpublished Masters Thesis. |
| 53. | Wahome, G., Wanyona, G., & Njeri, T. W. (2013). Effects of the Public Procurement Oversight Authority Standard Tender Document on Procurement of Public Works in Kenya. Africa Habitat Review, 557-563. |
| 54. | Weston Contractors Limited v Kenya Ferry Services (2014). |
| 55. | Whitfield, J. (1994). Conflicts in Construction, Avoiding, managing, resolving. London, London, England: Macmilan Press Ltd. |
| 56. | Wu, J., Kumaraswamy, M., & Soo, G. (2008). Payment Problems and Regulatory Responses in the Construction Industry: Mainland China Perspective. Journal of Professional Issues in Engineering Education and Practice, 399-407. |
| 57. | Ye, K. M., & Rahman, H. A. (2010). Risk of Late Payment in the Malaysian Construction Industry. World Academy of Science, Engineering and Technology, 1(41), 538-546 |