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## Business, IT and Market Strategy - Papers Index and Abstracts

### 033 - Human Side of Globalisation ..... 3 Neelam K. Kumar and Sunil Kumar

The advent of globalisation has led to a phenomenon in which economies of nations are increasingly interlinked due to offshoring/outsourcing. Given changed and altered paradigms and the advent of the WTO regime, we have attempted to understand the underlying factors and the effect of globalisation on people from East Asia to Latin America.

### 043 - A Combined Scale-And-Scope Ttheory of IT Industry Cluster Growth ..... 7 Robert J. Kauffman and Ajay Kumar

Most information technology (IT) clusters are characterized by a heterogeneous mix of IT industries employing different technologies and producing a wide range of hardware, software and services. We study how collocation of one IT industry influences innovation and growth in another IT industry. We examine whether scale and scope effects can explain how collocation, the act of placing potential complementary assets together in geographic space, influences innovation and growth even though use of IT has been expected to lead to greater geographic dispersion of industry. Economies of scale effects (or MAR externalities) suggest collocation of many companies with similar activities. Economies of scope effects (Jacobs externalities) suggest that heterogeneous activities placed in proximity lead to the greatest levels of value creation. From this, we propose a combined scale-and-scope theory of IT industry cluster growth. Our perspective emphasizes the amplifying effects of scale-size on scope effects across industries. We study the growth patterns of four IT industries: computer and peripheral manufacturing, semiconductor and other electronic components manufacturing, software publishing and data processing and what effect collocation of one industry has on others. Our data covers firms in 170 counties of 17 states in the United States in a longitudinal study spanning 1998 to 2002. Using econometric analysis, we find that different IT industries are affected differently by collocation. The software industry does not experience significant collocation externalities. In contrast, the semiconductor industry experiences significant scale-size effects, as well as scope effects from the software industry, which enhance its scale-size effects. We also find that computer manufacturing experiences economies of scope effects from semiconductors, while data processing feels scope effects from the computer and software industries.

### 054 - Determining Major Turning Points in Industry Evolution ..... 12 T. Haapaniemi and S. Mäkinen

Recently in academic research it has been explicitly acknowledged that the evolution of industries is not a smooth process but it contains dramatic turning points, and especially the takeoff point in evolution has attracted growing attention. The earlier research has identified that the takeoff point in evolutionary trajectory of adoption of innovations is of special interest in managerial decision-making since at this point the basis of competition change from technological functionality to more marketing related competencies as the dominant designs are adopted. However, existing studies do not evaluate the reliability of identification methods in comparison to alternative methods. The present study analyses three different ways to determine the takeoff point and their reliability in relation to each other. The results of the study show, among other things, that the experts' determinations produce notably better and more reliable results than other methods, like diffusion analysis.

### 058 - The Influence of Irrational Market on Company Investment --Based on the empirical work of real estate listed companies in China ..... 17 SHA0 Xi-juan, YANG Jian-mei, and CHEN Xiao-xia

We use the methods and indexes according to the paper published in 2003 written by Baker, Stein and Wurgler, which does empirical work for the American capital market. By studying the data from financial statements of 66 listed real estate companies we can obtain: strong equity-dependent companies have a sensitivity of investment to stock price that is 3.33 times as large as weak equity-dependent companies; The company investment behaviors and stock price is positively correlated; moreover, the correlation is more pronounced than that of American market. The irrational capital market in China has an impact on company investment, especially on the equity-dependent companies. Furthermore, influence is more remarkable than that of American market. This paper also studies the relationship between cash flow and company investment behavior. As a result, the sensitivity of investment to cash flow almost keeps the same for the companies of different equity-dependence.

### 060 - A Model of Credit Risk Assessment for Listed Company in China: An Empirical Study ..... 22 Wei Yang

Credit risk is one of most important risks of financial market, which is concerned by all circles of society. This paper puts forward the credit risk evaluation system that suits the listed companies in China based on current studies of domestic and international researchers. According to the situation of the credit risk assessment and the credit risk management of listed company in China, we select 208 listed companies in 2003 as the sample studying. Then through the Fisher of differentiated analytic approach, we set up a new model which might be helpful for investors, managers, financial agencies and government to evaluate the credit risk of listed company in China.

### 072 - The Evolution of Clustered Firm's Collaborative Relationships and its Causes under Global Context ..... 27 A. Q. Wu and J. Li

Based on the data from 5 industrial clusters in Zhejiang province, this paper found some profound change with clustered firms' collaborative relationships under global context, such as the intensification of local production collaboration, the improvement of local collaborative modes, the prolongation of local collaborative relationships, and the diversification of global collaborative relationships. Low cost and flexibility are the two main reasons for clustered firms to organize local collaborative relationships, and market exploitation and technology learning are the important reasons for global collaboration. These changes demand clustered firms to attach importance to local network and global network, and take the advantage of their resource through dynamic cooperation.



**Business, IT and Market Strategy - Papers Index and Abstracts**

**093 - Engineering Practice and National Cultural Context ..... 32**  
**T. L. J. Ferris**

This paper argues a case supporting the view that the practice of engineering is fundamentally culturally bound. The case is constructed through exploring the cultural boundedness of the practice of science, of technology, and then turning to the practice of engineering, including the technology produced through engineering, the engineering analysis used in the design of the technology and the enterprise processes of the organisation in which the engineering activity is performed. This theme is further explored in relation to the structure of the most recent systems engineering standard, ISO 15288 which is structured very differently than the earlier systems engineering standards in the manner in which it deals with the engineering process required to deliver a product system.

**169 - How a Power Utility in Brazil is providing electricity to 380.000 poor customers with minimum environmental impact ..... 37**  
**Sandra Neusa Marchesini Ferreira**

Bahia State is one of the least electrified in Brazil. The great challenge is to provide electricity to 380.000 rural customers not yet served, with a minimum environmental impact. This paper will show how the company achieved this goal through the implementation of Cleaner Production. After identifying all the environmental impacts due to the project and construction of electric distribution circuits and all the legal requirements of the federal, state and local environmental legislation, the appropriate solutions were implemented: 1) environmental training of employees and contractors directly or indirectly related to the program, as well as to some special communities such as indigenous, African descendants, island inhabitants; 2) choice of the best path, avoiding native vegetation, rivers and special areas under protection; 3) reduction of the right-of-way width from 15m to 4m whenever possible, together with the use of selective cut of trees alongside the circuit path; 4) use of insulated cables in secondary circuits (220V), among others. After three years of implementation the program have important results to show: less than 10% of the new projects (over 1.000 new projects in the 2002-2005 period) need an environmental license. The remaining 90% are constructed without cutting native vegetation generating minimum environmental impact.

**173 - Top Management Salary, Stock Ratio and Firm Performance: A Comparative Study of State-owned and Private Listed Companies in China ..... 42**  
**Mangui Wu and Shunmin Shu**

Using data collected from 547 state-owned and 95 private companies listed on China's stock market, this study compares the two groups on the relationship of top management salary, its increase and the stock ratio they hold, on one side, and firm performance, on the other side. Results of univariate and regression analysis indicate that there is no significant difference between state-owned and private companies on top management salary and the stock ratio they hold. The increase of top management salary is not related to firm performance. The stock ratio top management hold is not related to the intensity of competition in the industry, and it has no impact on firm performance. Implications and future research directions are also discussed.

**176 - Study on the Rationalization of Transportation Structure and Its Infrastructure Structure ..... 46**  
**Wei Liu**

This paper describes separately transportation infrastructure structure, transportation structure and the relation between them, shows the necessity and importance of the rationalization for construction structure of transportation infrastructure, analyzes the factors and criteria to the rationalization, quantitatively by structure-effect model, appraises the state of the transportation infrastructure structure of China from the logical and practical requirement for the rationalization, and finally gets some conclusions for a rational transportation infrastructure structure. The method put forward here can be also applied to assess the state of the construction structure of transportation infrastructure in an area.

**194 - Competitive Advantages of Patent Platform Strategy ..... 51**  
**JIANG Jun, WU Lan-fen, and WU Qiu-ming**

Product platform and technology platform are the instrumental tools for high-tech enterprises to develop and produce new products in the development of modern industry. And patent, as one of core technology resources, is of utmost importance to the development of high-tech enterprises. If the enterprise can integrate patent strategy and platform strategy, they can gain competitive advantages of technological leap, technological innovation and technology transferring on space. This will enhance the core competence of high-tech enterprises.

**199 - All Element Innovation Consolidating the Foundation of All Involvement Innovation\* ..... 56**  
**XU Qingrui, WU Kailiang, SHUI Changqing**

The technology-based innovation model in China has passed through stages as: Secondary innovation, Portfolio innovation and Total Innovation Management (TIM). The Total element Innovation (AEI), All Involvement Innovation (AII) and All Time-Space Innovation are three main aspects of TIM theory. The objective of this paper is to study the interaction between AEI and AII. We conclude that AII is the foundation of AEI and also influenced by AEI. Finally, the case study of Haier, the famous Chinese firm, will help to support our conclusion.

\* This researcher is supported by NSFC No.70372018.

**242 - The Study on Basic Approaches of Firms' Using IT with a Resource-Based Perspective ..... 61**  
**Xiaobo Wu, Gang Fang and Zengyuan Wu**

The evolution of information technology (IT) in firms can be captured in some stages, and each stage displays distinct characteristics regarding the application of IT and has different objectives. Thus, different IT resources and skills are needed in different stages. The purpose of this paper is to develop the theoretical links between IT capability and the stage of firm's using IT. Firstly, three stages of IT applications in the firms are identified: internal integration focus effectivity, external integration focus effectivity and strategic orientation. Secondly, three levels of IT capability are analyzed in detail. Based on resource-based view (RBV), a model linking the level of IT capability with the stage of IT applications is built finally in this paper. In order to build competitive advantage, firms must cultivate and upgrade its IT capability dynamically according to the evolution of IT applications.



## HR Management, Culture and Training - Papers Index and Abstracts

### 022 - Management Methodology Applied to WEB Courses Production ..... 70 Luis Fernando Ramos Molinaro, Humberto Abdalla Junior, Daniela F. Garrossini, and Cristiane Arakaki

The goal of this work is to offer a methodology to produce on-line courses on the Web, allowing an improvement on the creation process. This proposal is based on practical experiences conducted at NMI and theoretically on three main aspects: the chosen method on content creation, the way how will this production be structured – shall be defined as the product lifecycle, and how to manage it, employing in this case the concepts of project management. To understand this proposal, the associated subject are: e-learning, instructional models for course construction, project management and creation of digital content. Finally a methodology of this proposal is showed in order to create Web courses, in addition to a case of study illustrating its utility.

### 075 - Modeling the Performance in Chinese Engineering Managers ..... 75 X.J., Chen, J.P., Zhu, X.Y., Xie, and Z.H., Lin

One of the trends in performance appraisal is about modeling the work behaviors, and considerable researches show behavior process is an important factor contributing to the employee's total performance. Based on the contextual and task performance construct, we conduct a field research in Chinese engineering managers. The result shows the performance model consists of 3 dimensions: personal motivation, organizing task and behavior performance, and managers perform better in organizing task than in other two dimensions. At last, we discuss some implications for practice.

### 076 - Managing the Human Side of NPD Projects to Support Process Integration across Networks of Strategic Partners ..... 78 Yuosre F. Badir, Francis-Luc Perret, and Christopher Tucci

This research investigates the impact of the team and project leader empowerment in the 'network focal company' (the main company in the network) on the integration of the NPD process across a network of strategic partners, and the subsequent effects on project performance. The paper proposes a contingency model and develops a condition of fit between contextual conditions that characterize the high-tech NPD project and the extent to which the project team and leader are empowered. The model suggests that the efficient performance of the development project (shortest, cheapest, and highest quality possible) is contingent on how well the actual intensity level of integration fits the required intensity level. The research also indicates that the required intensity of integration between the focal company and the project strategic partners in uncertain and complex project is dominated by the development cycle time (DCT) of the project. Conversely, the actual intensity of integration is enabled by varying extent of team and leader empowerment, ranging from limited to significant.

### 081 - Managing Leadership in a Systems Acquisition Life Cycle: A Strategic Framework ..... 84 Misra Harekrishna

Software process models in the context of IT acquisition capture user information. In many cases user requirements are captured and/or understood poorly or at times user is not able to define its own requirements; this may lead to modification in the system or even re-work. Systems acquisition in an organisation brings in a new environment. This not only changes the way process is handled (process reengineering), but also affects the business culture and the overall performance. An acquisition is said to be successful if it is put to effective use, benefits are achieved as expected. Successful management of these issues is possible through organization of leadership and it should be well planned before initiation of systems acquisition i.e. in pre-acquisition stage. In this paper these leadership issues related to user involvement and organization's preparedness to handle an acquisition life cycle are discussed. The paper describes a framework to test its "fitness" through structural equation modelling to be used for understanding the predictive behaviour of the acquisition success.

### 090 - Maintenance-Automation Engineer: Realistic Considerations for a New Curricula ..... 89 Albuquerque, Carlos Jesivan Marques and Fortes, Marcio Zamboti

In the last few years the technology industry has changed quickly specially due to the development in the semiconductor area, software progress and new materials. From the operational point of view, it can be said that, one of the greatest advances was in the maintenance tests area that followed the same advanced pace of the previous referred areas, and which was permitted by its development. Managers in the industry have made effort to reduce costs and to increase productivity without changing teams. They are looking for new engineers with special knowledge, mainly related with good formation for operate and manage automated process, with joined qualification for acting in consonance with the updated philosophies maintenance. But it is not easy to find them because the university doesn't update engineering courses at the same speed as it is demanded by the industry. Like this, some Engineering Curricula are old and incomplete and cannot meet those real professional necessities in the industry. The purpose of this paper is to present a new profile suggestion for Engineering, considering these real needs due to the advances in computer, communications, process control, quality standard, and automation process, in a new industrial reality. It will describe a research about the actual status of maintenance/automation professional in the south region of Rio de Janeiro State in Brazil and analyze some results that it suppose can inspire a new formation for the engineering professional referred above.

### 094 - Leverage Sport Management and Coaching to Win High Tech Global Game ..... 94 Christopher H Pham, Munir Palla, Kioumars Houshmand, Srini Goli, and Rahim Esmaili

In IEMC 2004 publication, the paper "Using Sport Analogy in High-Tech Management to Improve Productivity by Improving Personal and Team Performance" [1] received amazing number of feedback. Further communication with readers inspires the authors to continue with this contribution to provide more insight of our coaching and development process to build, support and continually renew the team. The paper describes the management strategy to prepare, win and sustain the global high-tech games with a team composed of high performers with complement skill sets and experience from all regions of the so-call "flat world". Again, sport analogy is used in the same style as the first paper to deliver the points across.

**HR Management, Culture and Training- Papers Index and Abstracts****099 - Key Foundations to Successfully Build and Manage Productive Global Virtual Teams ..... 101**  
**Munir Palla, Christopher Pham, Kioumars Houshmand, Johnson P. Jose, and Vedamoorthy M.**

With global competition and cost pressure increasing, companies are forced to find the most cost-effective ways to develop and support their products. The cost advantages have however introduced many variables to the way business used to be conducted. Concerns include the protection of intellectual property, retaining core competency, and managing off shore locations. Automated Regression Facility (ARF) at Cisco Systems is one of many organizations that decided to leverage the available pool of talent overseas and outsourced some of its work to Taiwan, and India.

While the rest of the world may be looking at cost as the major factor for globalizing the human resources and development centers, ARF looked at the technological advantages and business excellence as the key factor. In this paper we share our experience of how working together corporations can create "One Team" consisting of many virtual teams, and overcome the challenges posed by the global economy.

**102 - Research on Organizational Learning Mode in the Life Cycle of ERP System: a Case Study of Westlake Electronics Group ..... 106**  
**Zengyuan WU, Xiaobo WU, Gang FANG, and Bei WU**

Enterprise resource planning (ERP) is not only a software system, but also an advanced management idea. The goals of enterprises' implementing an ERP system are to make full use of enterprise's resource. Some enterprises benefit much from implementing ERP system. But some enterprises fail and even go bankrupt. Why are their results so different? This paper tries to explain it from organizational learning perspective. We argued that organizational learning competency is a determinant factor of implementing ERP system successfully. There are 4 stages in the life cycle of ERP, including introducing stage, implementing stage, crisis stage, and decline stage. We argue that there is a leading organizational learning mode in each stage of ERP's life cycle. With formal intra-organizational training and learning from others, an organization can accumulate knowledge and overcome knowledge barriers, which will help to implement ERP system successfully.

**104 - Targeting Areas of Improvement in Intra-Group Dynamics using a Participative Approach - a Case Study ..... 110**  
**Apurva Mohan, Erwann Lemenager, and Michael McCracken**

Intra-Group Dynamics is a major factor influencing team performance. In fact, it has been cited as one of the major differences between performing and non-performing teams. Although lot of effort has been made to understand Intra-Group Dynamics there is no fixed rule on how to improve it. We suggest that improvement of team dynamics is a context dependent subject and best results can only be achieved through team participation.

This paper is a result of a study done at Schlumberger Oilfield Services to assess the Intra-Group Dynamics of an R&D team. We first assess the Intra-Group Dynamics level of the team through a questionnaire survey based on 7 pre-defined parameters. The survey was based on a Likert scale measurement and internal consistency of the survey was measured by calculating Cronbach's alpha for it. We confirm the findings through team members' perception of the 7 parameters and try to find measures of improving Intra-Group Dynamics within the team through personal interviews and brain storming. Our hypothesis is that the team will be more dedicated to these measures because of their participation in the process.

**113 - Empirical Study of Elements and Interrelation about the Current Situation of Continuous Improvement ..... 116**  
**Yanjiang CHENG, Yiqin WANG, and Lang XIE**

Continuous improvement, originating from the research of quality control, has been a focus in both academic and business fields. In recent years, continuous improvement activities have been carried out among the companies all over the world due to its positive effects on business operations. Based on the data of the Global Continuous Innovation Network, this paper analyzes the present situations of continuous improvement among worldwide companies. This database is composed of 586 samples of companies from some 12 countries. The characteristics of continuous improvements are measured with 34 questions in the questionnaire, which are categorized into 6 groups. The objective of the research is to explore the evaluation elements of continuous improvement and find out the interrelations among them. At the end of the paper, suggestions are made on continuous improvement for companies.

**135 - Building a Successful Career in Engineering ..... 121**  
**Dr. A. D. Cropper and Dr. Jacquelyn R. Bolman**

This paper describes one's approach to obtaining, maintaining and motivating oneself to stay inspired as one matriculates through one's career. The paper provides a step-by-step process for matriculating through one's career starting with a self-assessment, which provides options for your career plan, defines your strengths and weaknesses, and ensures that you are on the right road. In addition it helps match your strengths to the work you are considering and identifies what your contributions could be to the marketplace. The paper then takes you through the career decision-making process where one identifies one's long and short-term goals by matching career, personal and community objectives for lifelong learning, resulting in learning or personal career plan. The final stage to building a successful career in engineering is the identification and closure of the ideal job that matches your skills and learning objects, to job needs.

**HR Management, Culture and Training - Papers Index and Abstracts****154 - What value does money play in the motivation of 'knowledge workers' such as Project Managers 127**  
**Dr. D J Hancock**

Much of the current research into motivation and performance list things areas such as task variety and work autonomy as the main constituents and money is reduced to a hygiene factor in employee performance [1]. However much of this conventional research has been carried out in the retail and manufacturing industries where much of the work is repetitive. How does this model fit for the new developing areas of professionals classed as 'knowledge workers' [2], to which the profession of project management belongs where task variety and a high level of work autonomy already exists. This paper looks at one aspect of the survey carried out across the Consulting Business Group, Halcrow Group Ltd that of how the recognition scheme was perceived after its introduction by members.

There is much evidence that contingently administered recognition schemes can be as powerful a reinforcement to increase employee performance as a part of a total reward model. Driven by this proposition, Consulting Business Group has been carrying out a pilot recognition scheme across all its 523 staff, over a 6 month period from April to September 2005, predominantly targeted at the staff in the UK and this report deals with the feedback from those staff and the underlying implications for knowledge workers such as project managers.

We received 281 responses (Total staff number of 523) from 27 offices worldwide representing a return of 54% which means that the results of this survey are statistically relevant and can be said to represent the opinions of the business group. The overriding factor was that only 3% of this group of staff would be against us continuing this scheme and believe, despite the variety of viewpoints, philosophies and concerns, that it is a worthwhile initiative. However where the most interesting discrepancy was the way in which money was viewed rather than as a hygiene factor that the research had indicated it appeared to be a 'badge of status' with implications for self-esteem and exercise of influence and directly related to work effort and job satisfaction. In fact they appear to use pay as a means of evaluating their net worth to both the organisation and the external labour market checking constantly for discrepancies between the two.

**186 - A New Motivation Approach for Intellectual Employees Establishment and Management of Dynamic Psychological-contracts ..... 132**  
**WANG Li-ying and CHEN Jin**

By analyzing the characteristics of intellectual employees and the structural features of their psychological contracts, this article puts forward the necessity of utilizing psychological contract as a means of motivation. Managers should focus on the psychological contract, and adopt a dynamic motivation system on the basis of the harmonious psychological contracts. Moreover, this article also sets up a comprehensive motivation model with the same base, and the proposal to establish commitment-focused incentives. If the psychological contract between employees and their employers can be kept, consolidated, revised and developed all the time, the various motivation methods can be effectively integrated, and employees' innovation ability will be virtually stimulated.

**195 - On Leadership Development in the National Health Service Scotland ..... 136**  
**T. S. Durrani and S. M. Forbes**

The National Health Service (NHS), which delivers healthcare to all in the UK, is undergoing profound change, from the role of the primary-care providers, the general practitioners, to the specialist hospital managers. There is a drive that ranges from greater care in the community to more effective use of highly specialist resources in hospitals. This is linked to the restructuring of the management in the NHS, requiring a new breed of leaders to achieve organisational change, and to attain development and growth. To develop the new cadre of managers, an exciting Programme is being established for Leadership and Organisational Development. This paper reflects on the background to the change in the NHS, and provides an account of the Leadership Development Programme that is being implemented in the NHS Scotland.

**210 - A Conceptual Model on High-Performance Leadership and Organization Performance ..... 141**  
**B. W. Liu, L. Zhang, Y. Z. Tian., and H. Peng**

The leadership performance can effect the organizational performance directly. The leadership performance and the organization performance have been the subject of much concern among businesses and academics over the past few years. Traditional organization couldn't meet the need of the new economics environment; Set up a high-performance organization is the goal of all modern companies. The high-performance is different from the traditional organization in the aspect of leadership. High-performance leadership is synthesis which including skill, behaviors and strategies vision of the leaders. On the basis of distinguish the high-performance organization from the traditional organization; this study proposes a conceptual model on the impact of high-performance leadership on organization performance. The model shows that leadership skill, behaviors and strategies vision are the factors of high-performance leadership, they can influence the organization performance through integrating high-performance leadership. While culture context also play role by effect others factors, it is infiltrative factor.

**214 - A Management Tool for the Performance Management of Distributed (Global) Dynamic Engineering Design Processes ..... 146**  
**Wolf-Ekkehard Matzke and Dr.-Ing. Gunter Strube**

This paper describes an approach to model engineering design systems and to assess, simulate, and plan the performance of the design processes supported by those systems. An agent based system is developed which models design infrastructure, global design support, and engineering teams, as well as the associated design processes. It performs dynamic project simulation as well as performance measurements in a retrospective, descriptive, and predictive way. Such a system can be applied to project planning, continuous monitoring, scenario analysis, and replanning. Therefore, it can manage the performance of design infrastructure and design support and engineering teams.



## Innovation Management and Entrepreneurship - Papers Index and Abstracts

### 018 - Entrepreneurship in China: Evidence from Eastern, Central and Western Regions ..... 153 HE Mao

Nowadays, the re-emergence of a dynamic private sector has become the driving force behind the China's spectacular economic gains. This paper employs data from the three China planning regions, i.e. eastern, central and western region to study nascent entrepreneurship. We know from statistic data that entrepreneurship levels differ between regions. A version of the probit model is used to test individual and regional factors' role played in entrepreneurship. We show that the region matters for the decision to start a new business *ceteris paribus*, i.e. after controlling for sex, age, education etc. The consequences of these findings for regional policies to encourage new firm entry are discussed briefly in the concluding section.

### 074 - Examining the Network Competence - Innovation Success Relationship and Its Moderating Influence: An Empirical Study in China ..... 158 Jinfa XU, Xueguang CHEN, and Xuefeng LIU

With the development of economic globalization, more and more Chinese firms have recognized the importance of establishing and utilizing relationships with outside organizations under the circumstance of network competition. While, how and why are firms able to set up and use these relationships to cultivate their competitive advantage and make them a good development? We use the concept of network competence, a kind of capability about developing and managing outside network relationships, to search the reason. Through an empirical analysis on the firms in Zhejiang, an east province of China, we find that network competence has a strong positive influence on a firm's product and process innovation success, which are key aspects of cultivating firm's competitive advantage. In addition, market turbulence, technological turbulence, and competitive intensity, the three environmental variables, having a moderating influence on the relationship between network competence and innovation success is identified too.

### 079 - Issues of Fostering Innovational Engineers in a Technology Oriented Enterprise ..... 163 Keisuke Kumamoto and Osamu Tomisawa

In this paper, we will discuss necessity, scout method and the training technique of engineers who will create innovations with a trend analysis of software industries. The criterion for finding human resources is depending upon the person who has her/his own strong interest say "the desire" about innovations. It is important that their cultivation should be worked out under the circumstance of daily job incorporated with their strong interest.

### 160 - How do Chinese Canadian Entrepreneurs Start Businesses ..... 168 Li Baoming

Based on the empirical survey, the paper identified the profile, motivations and entrepreneurial characteristics of the Chinese Canadian entrepreneurs and their businesses; analyze the process of the venture creation; explore the barriers and the business environments confronted by them as well as their future business plans and success factors; and to propose some suggestions for the government.

### 161 - Influencing Factors of E-innovation Performance ..... 173 JIN CHEN and WEN-QI ZHOU

In this study, a model is developed and tested to evaluate E-innovation projects. The influencing factors are project strategy, feature of team, feature of team members, communication mechanism, process control, resources support, market feature and culture while the E-innovation performance are in terms of window of opportunity, financial performance and market share. We collect data via focused survey and questionnaires to nearly 50 E-innovation projects in China, and analyze these data through factor analysis and multiple regression. The results indicate that companies should pay more attention on three most significant factors--project strategy, market feature and culture, as they are the common influencing factors to the three dimensions of performance.

### 167 - The Schedule Control in the Enterprise Cooperative Innovation Based on Multi-agent ..... 178 Shi Chun-sheng and Xin Chong

This paper presents the enterprise cooperative innovation schedule control structure, which is a highly agile and autonomous control paradigm based on multi-agent consisting of multiple intelligent units called "agent". It can both guarantee the quick circulation and exchange of control information, and provide the efficient control and negotiation mechanism. Enterprise cooperative innovation (ECI) is the temporary action of distributed, autonomous and cooperative member enterprises (MEs) that have the typical features of "agent". Based on the characteristics analysis of ECI control structure, this paper discusses the structure function and the schedule control information transferring process of it and proposes the basis supporting platforms of implementing project schedule control in ECI. The disturbance factors of influencing project schedule and its control strategies are then discussed. To eliminate the schedule deviation caused by member enterprises exiting, the negotiation model of seeking a substitute enterprise is presented and validated by using a simple example.

### 190 - Empirical Study on the Evolutionary Process of Dominant Capabilities of Non-state-owned Enterprises in the PRC ..... 183 QIN Hui and WANG Qing-xi

Empirical study on the evolutionary process of dominant capabilities of non-state-owned enterprises (NSOEs) is made out in this paper. It is examined that the dominant capabilities underlying the competence vary in the stages of enterprise growth. The results of study indicate that entrepreneur's innovation capability is one dominant capability in the growth phase, marketing capability and human resource management capability are dominant capabilities in mature phase, while guarantee capability for system and funds are the dominant ones in decline phase. Learning capability runs through the whole evolutionary process, and it is the foundation of the other capabilities. It's suggested that NSOEs should adjust their structure of capabilities through uninterrupted learning according to practical condition of enterprises in practice. And the NSOEs should actively cultivate their dominant capabilities in different stages so as to form competence. It is important for NSOEs to gain competitive advantages and realize sustainable development.





## Knowledge Management - Papers Index and Abstracts

### 031 - Analysis of Knowledge Acquisition and Innovation Performance by MNC Subsidiaries in China from the Perspective of Social Capital ..... 190

Wang Lisheng, Fanghui Ju, and Jinxiang Zha

China is one of the fastest growing economies in the world in recent years. One of the main factors in China's economic development is the large number of foreign enterprises established by multinational corporations (MNCs). The efficient knowledge transfer and exploitation is a critical factor for the survival and performance improvement for the overseas subsidiaries. This paper, based on the relevant literature on knowledge transfer in the context of MNCs and social capital, analyzes the impact of the three dimensions of social capital on knowledge acquisition and innovative performance under the background of Chinese culture, proposes a conceptual framework and some hypotheses for further empirical study as well as some advice for future research.

### 065 - Global Manufacturing Network and Knowledge Transfer ..... 194

Xiaobo Wu, Xuefeng Liu and Jiong Wang

Global Manufacturing Network (GMN) is a new manufacturing system that has super manufacturing and servicing abilities. It is challenging traditional manufacturing conceptions. This paper describes and analyzes the driving forces of emergence of the concept of GMN, its evolution, members, and its theoretical bases. This paper also explores the knowledge transfer in the GMN, which consists of the mechanism and process of knowledge transfer in the GMN. Finally, the factors which contribute the knowledge transfer in the GMN are discussed.

### 080 - Factors of Knowledge Transfer in Global Production Network: In View of a Developing Country ..... 199

Xiaobo Wu, Guannan Xu, and Zhenzhen Pei

At present, global production network (GPN) has become one of the new figures of the globalization tide. It opens an opportunity window for developing countries to learn from GPN. The paper proposes a 2-stage model describing the factors of knowledge transfer from global production flagships (GPF) to its participants in developing countries. In the first stage, there are two factors affecting the extent of knowledge from GPF to its participants: transfer activities and relationship between the two parties. In the second stage, knowledge from GPF, relative absorptive capacity and absorptive capacity of the local firm are considered as the three main factors affecting the efficiency of knowledge transfer. To test the model, we survey 105 manufacturing firms in China via questionnaires. Further, how the form to participate in GPN influences knowledge transfer is also examined.

### 084 - The Options Approach to Hardware Design Decision: Switching from Object-Oriented to Aspect-Oriented Concepts ..... 204

Sarun Chaiworawitgul and Daricha Sutivong

Traditional hardware design is not flexible. Specification changes often require redesigning from scratch. The Objected-Oriented (OO) concept, which consists of encapsulation, inheritance and reusability mechanisms, is applied to solve the problem. However, the OO concept still confronts code maintenance problem, as the same function may be redundant in several objects. The Aspect-Oriented Programming (AOP) concept is introduced to hardware design to handle the challenges from the OO concept. To decide whether to switch the hardware design technology from OO to AOP concepts, one has to consider many uncertainties related technology change. The Net Present Value (NPV) is the traditional valuation approach to investment decision, but it does not handle uncertainties directly. The real options approach, which supports the valuation of project investment under uncertainty, is proposed to value the expected payoff of the technology shift from OO to AOP concepts. This paper illustrates how to apply the real options approach to hardware design decision. Insights from applying the real options framework are presented as guidelines in considering the hardware design technology switch.

### 088 - A Review of Thai Knowledge Management Practices: An Empirical Study ..... 209

C. Vorakulpipat and Y. Rezgui

The objective of this empirical study is to review current Knowledge Management (KM) practices in Thailand, and in particular to explore the knowledge sharing maturity and capability of Thai organizations and their readiness to embrace a knowledge creation culture. The survey focuses on a number of organizations drawn from an established taxonomy of organizations in Thailand using the stratified random sampling technique. The results indicate that (a) there is an established knowledge sharing culture supported by a corporate KM strategy, amongst high-tech organizations, as well as a preparedness for change to migrate to a knowledge creation culture; (b) a number of international organizations exhibit ad-hoc knowledge sharing practices as well as a growing awareness about the value of knowledge sharing and what can be termed as intangible assets; (c) a clear lack of any knowledge-oriented practice within ministry and department of public sectors. This empirical study provides a foundation to further the research and develop a framework for Thai organizations that promotes adoption of knowledge sharing practices as well as the migration from a knowledge sharing to a knowledge creation model.

### 185 - From Knowledge Sharing to Value Creation: Three Generations of Knowledge Management ..... 214

C. Vorakulpipat and Y. Rezgui

This paper provides a review of knowledge management (KM) literature by adapting and extending McElroy's [1] KM generations model. An interpretive stance is adopted so as to provide a holistic understanding and interpretation of organizational KM research and related Knowledge Management Systems (KMS) and models. It is argued that to be effective organizations need not only to negotiate their migration from a knowledge sharing (first generation) to a knowledge creation (second generation) culture, but also to create sustained organizational and societal values. The latter forms the third generation KM and represents key challenges faced by modern organizations.





## Knowledge Management - Papers Index and Abstracts

### 192 - Theoretical Frame about Influence Factors of Knowledge Sources of Multinational Subsidiaries ..... 221

Hui Zhang and Jinfa Xu

It is the key of creating competitive advantage to promote knowledge creation and knowledge sharing of subsidiaries in international enterprises. By network theory and knowledge theory, the text considers that knowledge sources of multinational subsidiary can be classified as three forms: internal network of subsidiary, external network of subsidiary and self-development of subsidiary. Then, the text examines the relationship between knowledge sources of multinational subsidiary and its determinants in terms of knowledge characteristics, parent company characteristics, subsidiary characteristics and host country characteristics, and according to related literatures provides hypotheses to carry out quantitative analysis and constructs a theoretical frame about influence factors of knowledge sources of multinational subsidiaries.

### 212 - Knowledge Transfer within Affiliation Networks ..... 226

Mauro Faccioni Filho and Pietro Panzarasa

This paper describes a new method for analysing knowledge transfer among interacting agents. By drawing on concepts from social network analysis, it develops a new approach to the study of valued affiliation networks. The case of the network of students involved in a distance learning engineering programme is then analysed to gain a better understanding of the possible applications of the proposed method.

### 213 - The Role of Organizational Knowledge Management Strategies in the Quest for Business Intelligence ..... 231

Harold M. Campbell

Knowledge management (KM) and Business Intelligence (BI) are topics, which are receiving much currency in the literature of academia and the general media over the past several years. KM, in this paper, is explored from the perspective of the acquisition of business intelligence inside and outside the organisation. An attempt is made to discuss how IT (Information Technology), and specifically, synchronous and asynchronous Groupware, may be integrated with KM in a drive towards creating BI. The term 'business intelligence' is being studied with specific relevance to the identification of business opportunities. In seeking to clarify the argument being made here, a model is presented and discussed in terms of the transformation process from KM to BI and the subsequent competitive advantage achieved.

The paper also outlines ten principles, which managers may use as a template to help their organisations create a successful KM initiative. These principles focus on those systems which organisations should implement to enable managers/agents to contribute new knowledge during their natural workflow interactions. This is critical to ensure that solutions that are currently in the system can be quickly added once the resolution has been determined. The principles in question range from a definition of KM as a discipline, the process of creating a change management plan, a template for focusing on the organisation's strategic goals, approaches in setting expectations or risk extinction metrics, identification of implementation strategies for integrating KM into existing systems, and initiatives which may be used to educate an organisation's self-service users.

We shall finally, discuss how the proposed KM-BI model may be used to assist an organisation to become a knowledge-enabled organisation.

**Manufacturing, Supply Chain and Resource Management - Papers Index and Abstracts****042 - Multi-agent Supply Chain System Architecture of Cluster ..... 238**  
**Yuangao Chen**

In the face of highly competitive markets and continuing pressure to reduce lead time and achieve quick customer response, more enterprises today consider supply chain management to be the key area where improvements can significantly impact the bottom line, but as the R&D, manufacturing, marketing and sales become entire global affairs, the basis of competition will no longer be between individual companies and their independent supply chains but between regional industrial clusters. In this paper, the supply chain system of cluster is discussed. So an agent-based system of cluster supply chain is designed to enhance the cluster supply chain management process. Moreover, multi-agent supply chain system architecture of cluster is provided.

**095 - Design and Implement of Warehouse Management System Based on AOP ..... 243**  
**Luo Cheng, Xu Didi, Lai Mingyong, and Wang Yan**

Warehouse Management System (WMS) is the answer to reducing inventory cost and improving degree of customer satisfaction, which means a great deal to enterprises. With the competition of logistic industry becoming severe, the need of promoting performance of WMS increases rapidly. This paper discusses the design and implement of WMS based on Aspect Oriented Programming (AOP), which simplifies its system structure, increases its agility, expansibility and maintainability by reengineering business logic, and thus adapts itself well to current warehouse management. We also describes how AOP was applied and how does it work in our system through an example of stocking in. Applying AOP to WMS benefits to solve some existing problems in current WMS, for example complex structure, poor maintenance and poor adaptation.

**179 - Performance Evaluation Model of the Supply Chain Viewed From Customers ..... 247**  
**Y. Z. Jiang, C.M. Meng, and W. C. Zheng**

Performance evaluation is one of the most important aspects to make Supply Chain Management (SCM) decisions. The evaluation from the customers' view is a complex problem, and evaluations of some factors may be subjective. This paper proposes a novel performance evaluation model of supply chains from customers' view. Based on the assumed conditions and principles of the metrics system, we list the relevant metrics and analyze the relationship among the metrics from customers' view. Then we use the fuzzy mathematic method to define the factors and target functions in the quantitative problems. Our goal is to set up a model to evaluate the performance of supply chain. The application of this model in enterprises is discussed through a practical example.

**180 - Research on the Impact of Innovation Factor on the Manufacturing Performance ..... 252**  
**P. Li, Y.Z. Tian, Z.Y. Qi, and Q. Jia**

Innovation is becoming an important power for the development of the manufacturing companies. Researchers usually focus on the three factors of competitive priorities: quality (Q), cost (C), and time (T), which comprise the main competence of manufacturing strategy. However, in this paper, we suppose that innovation can be a parallel factor with quality (Q), cost (C) and time (T), we develop a TCQ&I model, which depicts how these four dimensions of competitive priorities affect the manufacturing performance. Based on the literature of manufacturing strategy competitive priorities, we propose that the competitive capacity model consists of time, cost, and quality, including innovation, is superior to the model without the innovation factor. This paper uses the information from the database of the International Manufacturing Strategy Survey (IMSS). Using data from the IMSS, this study uses the empirical methods of exploring and analyzing the relationship model of the four dimensions of manufacturing competence, i.e. quality (Q), cost (C), time (T) and innovation (I), and how they affect the manufacturing performance, focusing on the Structural Equation Model analysis. The research methods of descriptive statistics, model fitting analysis, and multiple regression analysis are used. The statistical analysis tool applied is the LISREL software. The results prove the validity of the hypothesis.

This study concludes that the competitive model, which includes innovation, is superior to the model without innovation in both developing countries and developed countries. The effect of innovation to the manufacturing performance is further validated.

**203 - Mechanism and Optimization of Interior-Cycle System Based On Manufacturing Enterprise ..... 256**  
**YANG Yang, TIAN Yezhuang, and ZHAO Linlin**

Researching on interior laws of enterprise is vital to manufacturing development. Interior-cycle system is one of basic laws of enterprise. It is a series closed cycle in organization, which is composed of reciprocal relationships among interior units. The characters of interior-cycle include regularity, stability, self-adaptability and self-evolution etc. All these characters are good to the agility and flexibility of organization, and are good to the learning and memory of organization. However, we all know that the condition of organization, whether interior or exterior condition, changes rapidly, especially in information ages. So, it is not enough to deal with the fast changes of condition only relying on the self-adaptability and self-evolution of interior-cycle. The manager of enterprise must take measures to drive the interior-cycle optimization, and encourage the advanced sub-cycles to help the laggard ones. By this way, we hope to realize general optimization of interior-cycle and enhance the performance of manufacturing enterprise.

**220 - E-Flow: A solution of Workflow for integration of the management of processes with the documentation of quality using XML ..... 262**  
**Hugo Saba, Eduardo Manuel de Freitas Jorge, and Victor Franco Costa**

The extracted information of the workflow are similars to information about the quality document. The redundancy on this information brings necessity of a environment that integrates the quality management system with the workflow system. The project objectives are the specification and implementation of the E-Flow, it contemplates the integration proposal previously. For that, will be proposed a metalanguage, represented by XML, that approaches the basic attributes referring the documentation of the quality ISO 9000.

**233 - Empirical Study of Outsourcing in Manufacturing Companies ..... 267**  
**Dan Wang and Yu Zhang**

With increasingly fiercer competition and shortened product life cycle, companies are finding it more difficult to survive and develop. The environment also makes it difficult for companies to make quick response to market demand all by themselves. It is, therefore, necessary for companies to increase their outsourcing activities. Literatures show that many companies are endeavoring to establish their competitive advantage by means of increased outsourcing activities. This paper will analyze the motives of outsourcing decisions by companies, especially manufacturers. The relationship between the manufacturer's competitive priorities and its supplier selection criteria will also be analyzed. The analysis of this paper will be carried out by an empirical study utilizing the data from International Manufacturing Strategy Survey (IMSS).



## Product Innovation and Development - Papers Index and Abstracts

### 017 - Towards Indicators of Sustainable Product Design ..... 274

Paulo Fernando de Almeida Souza and Hernane Borges de Barros Pereira

This paper aims in presenting a proposal of a set of indicators of sustainable and responsible product design. The main idea is to develop a conceptual model of indicators, which will be presented and applied to design process in general. The proposed set of indicators is discussed and suggested as basis for the development of tools that offer a broader sense of sustainability in order to support the main decisions during the product development.

### 026 - Evaluation of a New Complex System Design Method on a Mechatronic Automotive Product ..... 278

Joaquin Sitte and Petra Winzer

This paper illustrates the application of the Demand Compliant Design (DeCoDe) method, proposed recently by the authors, to a real design problem faced by a supplier to the automotive industry. The Design flow of the method is detailed and the main advantages and disadvantages are pointed out. The application of the method resulted in a highly innovative design in very short time while guaranteeing the traceability of the design as required by product liability requirements.

### 030 - Determinants of Innovation Capability in Small and Medium Enterprises: an Empirical Analysis from China ..... 283

Chen Tie-jun

SMEs are an essential component of the Chinese economy. Especially in Zhejiang province, a province in east China, there are about 1.3m SMEs and they account for 95 percent of total employment. With the change of technology and market environment, the competition is fierce and SMEs are more dependable on innovation. Without innovation, SMEs cannot survive in the competition. SMEs are very different from the large companies. They lack of capital and human resource. How to improve the SMEs innovation capability is a question for us. In this paper, I use some proxy to evaluate the innovation capability. The paper aims to find the source of innovation capability for SMEs. In order to explain the question, the paper classifies the source for two types, internal source and external source. The paper designs the questionnaire to achieve the data from 75 SMEs in Zhejiang Province. From the data, the paper uses SPSS software tool to analyze to look for the key determinants of SMEs innovation capability. Through the analysis, the paper finds some important key factors that determine the innovation capability of SMEs, including internal factors such as the owner's work experience and external factors such as financial support. The findings of the paper are important for the SMEs to improve the innovation capability.

### 038-A Comparison of American and Japanese Competitive Product and Manufacturing Process Benchmarking and Reverse Engineering in the Electron Device Industry: Frequency of Use and Perceived Value ..... 287

Bruce A. Vojak and Toshihisa Hatakeyama

A survey of participants in the electron device industry has been conducted to better understand the differences between American and Japanese practitioners of competitive product and manufacturing process benchmarking and reverse engineering (CP/MPBRE). We have studied the responses of n = 221 survey participants who self-describe as new product and manufacturing process engineering practitioners. Consistent with the general literature on this topic, we observe that more Japanese than American engineers in the electron device industry engage in CP/MPBRE. However, expanding on the general literature, we find that, of those who do practice CP/MPBRE, American and Japanese practitioners in this industry do so comparably in terms of frequency of use and perceptions of value. We discuss the implications of these findings.

### 063 - Evolution of Management Processes for ASIC Development and Implementation ..... 292

Rakesh Kumar

Application Specific Integrated Circuits (ASICs) have enabled System designers to extend the tremendous capabilities offered by micro-miniaturization over the last 30-40 years. Management Processes for IC Development have evolved as the industry has transitioned from "Vertically Integrated" Design and Manufacturing to one having a Distributed and Global Supply Chain. While technical challenges have been reported extensively, this paper will provide an overview of the changes in Management Processes for the successful Development of massively complex Integrated Circuits. Special focus will be on the entrepreneurs at Emerging companies whose goal is usually the development of a special purpose ASIC using the Fabless, Distributed Supply Chain business model. It will be shown that addressing the Business, and both human and corporate Relationship aspects are crucial to successful coordination of the Supply Chain in order to deliver ASIC products on time and within the projected Cost targets.

### 067 - How to Develop Secure IT Products Using Common Criteria ..... 297

Margaretha Eriksson

The engineering organization must during development and maintenance of a certified IT product (digital tachometer) comply with mandatory, external information security requirements in Common Criteria (ISO/IEC 15408). This has impact on work procedures, developers, managers, testing and manufacturing. Strict change management and tracing of requirements is a must. The Requirements must be fulfilled and proved by a third party certification body in order to certify the product.

### 070 - Location of Back-up Transformers ..... 300

A. T. de Almeida, C. A. V. Cavalcante, R. J. P. Ferreira, H. L. Ferreira, and L. H. A. de Medeiros

This paper presents a multicriteria approach for the determining the proper location for a back-up transformer. Criteria such as: public health, local industrialization, the population of the area, and the distance are considered. When these criteria are taken into consideration, the best location is that which generates the least loss in maximizing the total utility, regarding the location of the back-up in a substation, taking into consideration the benefits of the back-up being in this place.

### 103 - FDI and Chinese Firms' Secondary Innovation ..... 303

Jian DU and Xiaobo WU

As one of the most important drives, FDI has been paid more and more attention for its effects on constructing the technological innovation capability and sustainable strategic competitiveness in the less developed countries. Innovation is the primary driving force of economic growth and globalization. Under the circumstance of economic and technological globalization, innovation process presents new features. How to gain, maintain, consolidate and develop competitive advantages is an exigent question that attracts the attention from both scholars and entrepreneurs. This paper tries to have a look into the characteristics of Chinese firms' secondary innovations in global competition. Some countermeasures for Chinese firms to survive and grow in global manufacturing are proposed. And implications on competitive strategies to gain late comer's advantage are discussed.



## Product Innovation and Development - Papers Index and Abstracts

### 118- Online Visual Merchandising of Apparel E-retailers ..... 307

Xiaofen Ji and Chen Pang

Based on the empirical literature, this study takes an exploratory approach to investigate the current online visual merchandising practices of apparel e-merchants in the US and China. The websites were content analyzed according to the manner of presentation, presentation technique, and product components. Some significant differences were found between the US and China's apparel websites selected. Moreover, this study seeks to provide preliminary information and suggestions helpful for apparel e-retailers in developing countries to take primary steps forwards in the correct direction.

### 155 - Technological Map as Tool for Technology and Knowledge Management ..... 312

Salloum S. Gustavo A.

Basic guidelines for the preparation of a technological map for structured companies are presented. Technological Map (TechMap) seeks to be a "Tool" for monitoring, pursuit, visualization and supervision of the knowledge and technologies in companies. Methodology used for TechMap creation originates a basic structure that allows its implementation for many structured companies with necessary flexibility for future organizational changes. Three main characteristics of technology are considered in this paper for TechMap creation; knowledge, tools and work process. The need to create a TechMap in companies to improve the technological management, increase the competitiveness and take advantage of to the maximum the personnel's competitions is developed when the steps for the creation of TechMap are explained. TechMap in engineering management is analyzed emphasizing its implementation in engineering design.

### 158 - Market Test Model of New Product on Women's Wear ..... 315

Xiaofen Ji, Liling Cai, Jueliang Hu, Shuguang Han, and Xiaofang Liu

Due to a variety of products and full of competition in women's wear industry apparel company was poor at forecasting market requirement, difficult to carryout and manage various questions in the process of market test. Therefore, we proposed a kind of market test model of new product on women's apparel by optimization technique. Performances of our model were evaluated using real data from a women's wear company. The conclusion was that our model was better than company's exiting method, and then apparel company could get much profit with reducing forecast cost and test cost.

### 201 - Research on Chinese Rural Public Goods Supply -- A Transaction Cost Politics Perspective ..... 321

CHEN Ye-wei and CHEN Yu-feng

The paper makes a survey on the suppliers of Chinese rural public goods and their behavior patterns in the transition period with a principle agent model for multimissions, and reveals the feasibility of a common governance model by the state and community to prevent free-riding on a case study. From the perspective of transaction cost politics theory, the study explores the frontier between the state and community.

### 202 - Radical Innovation or Incremental Innovation: Strategic Decision of Technology-intensive Firms in the PRC ..... 326

QIN Hui and WANG Qing-xi

With increasing international competition and rapid technological change, it has been emphasized that innovation is critical for technology-intensive firms to gain sustainable competitive advantages. However, we have little knowledge about which types of innovation should be adopted to overcome bottlenecks occurred during the process of firm's growth. From the contingency perspective, this study investigated the nature of incremental innovation and radical innovation reflected in the technological innovation, managerial innovation, institutional innovation and marketing innovation in different stages of the growth of Lenovo, one of famous technology-intensive firms in the PRC. The experience of Lenovo's growth suggested that it's very important to select right innovation strategies throughout its life cycle stages. Based on the case study, we proposed a general model of the strategic decision of innovation for technology-intensive firms in the PRC, the largest emerging economy in the world. It suggested that at the start-up or decline phase, firms should adopt radical innovation for technology, management, institution and marketing. At the growth phase, firms should adopt radical innovation for institution, but incremental innovation for technology, management and marketing. At the maturity phase, firms should adopt incremental innovation for institution, management and marketing, but both incremental and radical innovation for technology.



## Project Management and Risk - Papers Index and Abstracts

### 035 - Research on Components of Consumer Perceived Risk ..... 334

Haixia Gao

Consumer often weighs perceived benefit against perceived risk when making purchase decision. Most former studies pay attention to increasing consumer's perceived benefit. The study concerning reducing perceived risk is very lacking. Identifying and facing perceived risk is an important approach to break down buying resistance. The study brings forward a suit of method and process explore components of perceived risk.

### 037 - Selection of Project Membership Using Fuzzy Probability Goals for Cognitive Style ..... 336

Margaret F. Shipley and Madeline Johnson

The premise of this research is the development of a model that will assist management in the selection of team members to projects based on the ability to fit individual cognitive style as closely as possible to the project goal(s). The paper presents background information on cognitive styles and fuzzy logic with an algorithm developed based on belief in the fuzzy probability of a cognitive style fitting a defined goal. An application is presented and conclusions are stated.

### 040 - Project Uncertainty, Management Practice and Project Performance: An Empirical Analysis on Customized Information Systems Development Projects ..... 341

Q.Z. Wang and J. Liu

This paper develops a risk-based integrated model of information systems development (ISD) project performance to explain the effect of project inherent uncertainty and management practices on project performance. Based on the dataset collected from customized information systems development projects of software houses in Hangzhou City of China, this paper carries out an empirical analysis on the research model. The results reveal that performance risk in development stage and performance risk in implementation stage are two intervening variables, which mediated the effects of project inherent uncertainty and management practices on both process and product performance. The findings suggest that management factors such as project planning and control, internal integration, user participation and top management support can improve project performance in the presence of project inherent uncertainty. In addition, the key influencing factors are found to be different in different project stages. Key influencing factors are project planning and control, internal integration and user participation in development stage. Key influencing factors are user participation and top management support in implementation stage. However, we have not found evidence for significant positive influence of process performance on product performance, which means that projects which come in within time and cost budgets may deliver poor systems.

### 051 - Chinese Trust Judgment: A Risk Control Approach ..... 346

J. Yan and Y. H. Jin

Building trust with the Chinese partners is very important to the success of business in China. In this paper, a risk control approach was proposed to explain the Chinese businessman's trust decision strategies. 42 top and middle managers participated in the open-ended interview. Results showed that Chinese managers adopt a multi-stage gaming view about the interpersonal trust decisions. It is important that let the trustor have a feeling of control the process. Taking the perspective of the trustor will help trust building in Chinese business settings. Suggestions of trust building strategies with Chinese managers and further research were recommended.

### 055 - Enterprise Risk Management: A New Philosophy ..... 351

Richard Buhr, Andre Nel and Marco dos Santos

There is a need to develop a risk management model for generic Operational Support Systems (OSS), preferably implemented on top of the eTOM framework. On closer inspection of the eTOM framework it was discovered that risk management was virtually non-existent. After considering existing risk management recommendations such as the COSO RM framework, a need was identified for a new risk management paradigm. This paper presents the solution offered by the authors to serve the needs of not just the telecommunications industry, but any industry in need of a simple, logically structured risk management methodology.

### 082-Risk Management and Expert Opinion Assessment at Non-Profit Organizations: the case of UNESCO . 356

Fernando Machado Cavalcanti, Leonardo P. Santiago

Non-profit organizations play an increasingly important role in contemporary society. The fact that they are not profit-oriented, however, does not guard them against the need to manage resources efficiently. Still, due to their specific goals and organizational environment, non-profit organizations require appropriate tools to manage their projects' risk. With this in mind, we chose to study the case of Monumenta - a project that is being implemented by United Nations for Education, Science and Culture (UNESCO) in Brazil. Specifically, we propose an approach to assist the Brazilian arm of the UNESCO in estimating project risk by quantifying expert opinion. Then, we discuss generalizations of this experience to other projects at UNESCO. Furthermore, we believe the conclusions drawn from this experience could be extended to the management process of other non-profit organizations.

### 140 - A preliminary Factor Analysis of Project Completion Reports ..... 361

Carlton John Raccani and France Cheong

This study is part of a longer-term program in which we are working with an Australian Bank to improve its software development risk management practices. The sub-process under study is the project completion review process that is often used in companies as a means of formalizing and crystallizing the findings of a project at its conclusion. The research seeks to add to the very slim body of knowledge in this area and especially the reliability of the process and the tools used to support these processes. The research demonstrates that because of a weak operational definition of project success these processes and tools teeter precariously on what they are trying to measure. The validity and empirical value of the material flowing from these surveys is of therefore of questionable value. We offer some suggestions for how this process may be improved.

### 168 - Laying the Foundation of a Sector Wide Risk Model for the Telecommunications Industry ..... 366

Richard Buhr, Andre Nel, and Marco dos Santos

For executive management to guide an enterprise, forward planning is essential. Using Enterprise Wide Risk Management (EWRM) as an input to Scenario Analysis (SA) for Strategic Planning (SP) allows for improved accuracy over conventional methods. This would allow for greater realism from the executive management perspective of possible outcomes in scenario modelling by providing a solid quantitative base founded on real operational information. The core of any telecommunications enterprise is the Operational Support Systems (OSS) that provides the hardware, software and system's infrastructure to operate the enterprise. The smooth operation and efficient handling of any unforeseen events in the OSS impacts the very survival of the enterprise, thus the development of an OSS risk management (RM) strategy to provide an efficient and effective way to recognise, classify and mitigate the risks involved in OSS is crucial to any enterprise that seeks to remain competitive. To implement this RM strategy and provide information regarding likely loss events, a quantitative risk model is required to simulate different scenarios. One such event is the entry of a new telecommunications enterprise into the market and this research investigates the development of a Sector Wide Risk Model (SWRM) to simulate such an event.



## Project Management and Risk - Papers Index and Abstracts

**222 - Module Linkage Diagrams: Efficient Feature Delivery for Large Software Projects ..... 371**  
**Paul E. Martin**

This paper introduces the Module Linkage Diagram (MLD). This diagram identifies communication bottlenecks between development teams in the release-planning phase. Managers can relieve these bottlenecks by reorganizing the team, and programmers, by modifying the code.

Additionally, MLDs can indicate opportunities for releasing “loosely linked” software modules independently from the rest of the project. By separating critical loosely linked modules into independent releases, managers can deliver new feature content more effectively.

**240 - Risk Assessment Framework for Project Management ..... 376**  
**Eng Seng Chia**

This paper briefly describe what is risk and risk management. It then explains the major categories of risk drivers and proposes a 3-model framework to assess these risks. Depending on the need, these 3 models could be used independent for different projects or concurrently within the same project.

**243-The Use of Service Level Agreements in Operational Risk Management to Enhance Telecommunications Business Operations ..... 380**  
**M.P.F. dos Santos, W.A. Clarke, A.L. Nel**

In this paper, the authors discuss the need for Enterprise Risk Management and Operational Risk Management in organizations where substantial elements of the business processes are governed by a Service Level Agreement (SLA). To ensure the Operational Risk Management is properly integrated into the Operational Support Systems, we recommend the use of active feedback to drive the link between the customer's interpretation of the SLA and the operational view of the SLA. Further, a combined network-centric and customer-centric business model within the integrated Operational Risk Management function is proposed that can enhance existing business models, such as the eTOM for telecommunication service providers.



### Quality and Change Management - Papers Index and Abstracts

- 091 - Effective Change Management through Integration and Knowledge Governance ..... 385**  
**F. Madia, M.G. Dettori, A. Galasso, and G. Iacono**

This paper describes the approach and the results of a 2 years-old change management project currently in progress in Selex Sistemi Integrati, an high level technological Finmeccanica company.

- 200 - Total quality management indicators and DEA for Benchmarking the Mexican Electrical Industry 388**  
**J. Alberto Avalos-González, J. Jesús Rico-Melgoza, Marcelino Madrigal, and Manuel Madrigal**

Several incentive regulation schemes for distribution companies require benchmarking techniques to measure relative efficiency and compute X-factors for tariff adjustment in a way that competition is emulated through regulation. In this paper we benchmark electricity distribution zones within the Mexican electricity industry using Data Envelopment Analysis (DEA). The economical and technical efficiency measures obtained through DEA suggest that internal (non-regulated) Total Quality Management (TQM) programs might also have a positive impact over efficiency, as measured by DEA.

- 251 - Benefits Gained with Implementation of the Quality Management System in the Control Centers of the Brazilian ISO – ONS - A Process Vision ..... 393**  
**Flávio Guimarães Lins, Heloíza Helena Ximenes de Melo e Menezes, and Plínio de Oliveira de Filho**

This paper has as objective to present the management model adopted by the Management Quality System - MQS in the Control Centers of the Brazilian ISO – ONS. The Model includes eight basic principles: Focus in the client; leadership; employer's involvement; process approach; systemic approach; continuous improvement; factual approach for taking decisions and mutual benefits in the relationship with suppliers.





## R&amp;D Management - Papers Index and Abstracts

032 - Firm Size and R&D Subsidy Incentives: Evidence from China ..... 399  
Hua Cheng

Empirical evidence on the effectiveness of R&D subsidies to firms has produced mixed results so far. The main question is whether public funds stimulate R&D subsidies on firm R&D expenditure or simply crowd out privately financed R&D. Empirically, we investigate the average causal effects of R&D schemes in China. We find evidence suggesting that the R&D subsidies greatly stimulated company-financed R&D expenditures for small firms but had a negative effect on the R&D of large firms, although not statistically significant.

087 - Estimating Design Costs for First-of-a-kind Projects ..... 402  
Bakul Banerjee

Modern scientific facilities are often outcomes of projects that are first-of-a-kind, that is, minimal historical data are available for project costs and schedules. However, at Fermilab, there was an opportunity to execute two similar projects consecutively. In this paper, a comparative study of the design costs for these two projects is presented using earned value methodology. This study provides some insights into how to estimate the cost of a replicated project.

096 - Human + Machine Information Validation Systems: Legal Global Aspects ..... 406  
Mauro Leonardo de B. A. Cunha, Teresinha Fróes Burnham, and Hernane Borges de Barros Pereira

This paper surveys generalities about information legal validation and later investigates specific aspects of Brazilian federal governments experiences in public key cryptography, including a negative view of closed source cryptographyc software by Brazilian authorities.

187 - The Effect of Government Subsidies on Private R&D Expenditure: --Evidence from Zhejiang Province of China ..... 410  
Hua Cheng and Xianping Chen

China government has implemented some schemes of public funds in order to increase R&D intensity of private firms. This study analyzes the effects of public R&D schemes on the innovation activities of private firms in Zhejiang Province of China. The main question in this paper is whether government subsidies to Private R&D stimulate R&D activities or simply crowd out privately financed R&D. Empirically, we investigate the average causal effects of all government subsidies in Zhejiang Province of China using Propensity Score Matching. In order to account for possible selectivity bias, and to improve comparability of firms, two different versions of matching approach are employed. The Nearest neighbor estimator is preferred to the Kernel estimator. The results show that government R&D subsidies do not have a significant effect on R&D expenditures of private firms.



## Teams - Papers Index and Abstracts

### 023 - High-Performance Individuals and Teams: A Study of the Effect of Duration on Achievable and Sustainable Maximum Performance Levels ..... 416

C. R. Davis

High-performance teams are required for leading-type organizations because of the complexity and speed that work must be completed. This paper extends the fundamental groundwork-research of creating and achieving high-performance teams and individuals by introducing and investigating a new variable, duration, on the absolute values of high-performance achieved. Experimental results identify that Pmax decreases with duration for both teams and individuals and that teams are indeed more effective than individuals in performing tasks.

### 125 - Research on Top Management Team with Multi-Agent System Model ..... 420

DAI Wei-hui, SHEN Libing, and WU Liang

Based on the analysis and summarization of the research theory on TMT (Top Management Team), we propose the theory model and research approaches of TMT based on MAS (Multi-Agent System). Then we introduce our research work on the decision process of TMT from the systematic, dynamic aspects and artificial intelligence. Finally we introduce what we are going to study about TMT in the future.

### 166 - Models for Structuring Teams and Work in Globally Collaborative Projects ..... 425

Vu N. Tran and Hugo M. Latapie

The demands of globalization and availability of advanced work collaboration technology have created new opportunities for designing team and work structures in multinational organizations. Greater work efficiency, higher productivity, better market penetration opportunities, and lower development costs are achievable goals/outcomes with well-designed organizational structures that are congruent with a company's purpose, culture, and capabilities. This paper describes four common project organizational design models for structuring teams and work in collaborative work environment. We describe the characteristics, strengths, weaknesses, and implementation effectiveness of each model. Our goal is to codify the context that underlies these models to strengthen systemic thinking about team and work organization in globally collaborative project environment.

### 206 - A study on Synthetic Evaluation and Selection of Transport Mode for Oil and Natural Gas ..... 432

Wei Liu

With a view to environment protection and sustainable development, industrialized countries give priority to develop oil and natural gas industry. Pipeline and waterway transport are the main option modes to transport oil and gas, which have their each characteristics, strengths, competences, and inter-substitution. Therefore, to make decision and to solve the problem of efficiency transport for oil and natural gas by synthetic appraisal of transport mode between waterway transport and pipeline, which aims to realize energy transport in a rational way and harmonized development, and to avoid malignant competition and duple-construction, is critically essential. This paper put forward a synthetic evaluation method that "L-coefficient" formula integrates AHP (Analysis of Hierarchy Process) with fuzzy synthesis theory to evaluate and select a mode of transport of oil and natural gas between waterway transport or pipeline by practical way and analysis quantitatively and qualitatively from overall consideration on the benefits of both social and financial aspects. The study verifies that the synthetic evaluation of transport mode for oil and gas is applicable to make effective decision through a case analysis and finally gets some constructive conclusions and suggestions on considering the facts of China in oil and natural gas transport, by analysis and comparison between oil pipeline and oil-shipping and by analysis and comparison between pipeline of gas and shipping of LPG.

### 230 - A Perspective on Integrated Project Team Strategies ..... 437

De Villiers - T.J., and Pretorius - L.

The purpose of IPTS is to unite the core project participants (those 20% of project participants responsible for 80% of the impact on the project success) with a common goal, so that they focus on what is in the interest of the project and not on their company's interest or local optimisation.

Like a tripod, Integrated Project Team Strategies (IPTS) are supported on three legs that are referred to as its core principles. These principles are a common project incentive scheme, well-defined project success criteria and project control systems and procedures that focus on the project's needs and do not entice local optimisation.

Because monetary reward is a short-term motivator for change in personal behaviour, it is a carrot under the donkey's nose for the project management team and the core project participants. As all the core project participants in IPTS now share in the same incentive scheme, their actions will be focussed on the same target because it determines the size of their bonuses / incentives. Project success criteria are their common target. It is therefore important that project success criteria are well defined for all three areas of success namely project management success, product success and relationship success.

Traditional project control systems and metrics, which were used to measure the progress of the project, measure progress in isolation because they do not consider the overall need of the project. Local optimisation like tons steel erected per hour may occur because that is how managers on the project are assessed, however, that is not in the interest of the project. IPTS measurement systems focus on what is in the interest of the project and use performance drivers like critical chain and balanced scorecards differently to entice the required behaviour.

### 250 - High Order Organizational Learning in Air Navigation Services: the Role of Cross-Functional Teams ..... 446

Thanos C. Papavramides

"An organization's ability to learn, and translate learning into action rapidly, is the ultimate competitive advantage" 1. The paper examines how a particular class of organizations dealing with the provision of air navigation services may implement organizational learning (OL) by introducing cross-functional teams (CFTs) in the learning feedback loops. After providing the research framework and definitions, the paper explains why organizational learning is critically important to success. Generally, OL theories do not particularly focus on how practically OL can be achieved when treating the organization as a system. Our hypothesis is that an effective OL mechanism can be established by introducing CFTs in the learning feedback loops. The hypothesis was tested in two cases in which CFTs were used to perform strategic business planning following a particular method[3] while observing OL taking place. The conclusion is that although the management may multiply or reduce OL impact, CFTs in the learning feedback loops produce concrete, detectable OL. Suggestions are made on where further research may be needed.



## Technology Innovation - Papers Index and Abstracts

### 110 - The Theory And Empirical Study Of Regional Technological Innovation Capability ..... 453

Bei WU and Zengyuan WU

This paper first overviews the theory of regional technological innovation(RIS). Based on comparing and analyzing different evaluation system of regional technological innovation capability, a new index system is set up to evaluate the regional technological innovation capability including knowledge innovation capability, network innovation capability, enterprise technological innovation capability, innovation environment and innovation performance. After comparing different technological innovation capability of 31 provinces in China, this paper focuses on 21 innovation capability synthetic indicators of Zhejiang province from 2001 to 2003. The results shows that although the innovation capability of Zhejiang province is not very high, the government pays more attention to R&D input, patent application, scientific paper, S&T cooperation, basic innovation infrastructure, commercial environment and industry international competitiveness, all of those will influence directly improvement of long-term economic competition capability of Zhejiang province in the future.

### 157 - Study on Managing Effects of Information Technology Applied on Transportation ..... 458

Wei Liu, Wenshun Li, and Wendy Huang

Environmental pollution, traffic accident and so on, all these externality problems caused by transportation conflicted with the accepted social sustainable development. Many countries adopted the pollution control, transportation regulation or other restrictive policy to solve the problems, but on the whole had little effect. To show new thoughts to this problem, the paper studies the measures by using information technology (IT) based on evaluating qualitatively two forms of managing effect, substitutive effect and stimulative effect, of IT application on transportation, through analysis of data related to the freight turnover and the number of telephone in China from 1952 to 1998, reveals their close and perplexing relationship, takes simulative analysis in the case of a city, and concludes some findings, enlightenment and proposals to the corresponding further study.

### 172 - Research on Differences in Management Innovation of Non-state Owned Enterprises of Different Sizes: Evidence from Zhejiang, China ..... 463

Zheng Hai-dong and Jia Sheng-hua

This paper examines the differences in management innovation (MI) of non-state owned enterprises (NSOE) in different sizes. We argued based on our empirical research that small, medium size, and large NSOE will confront red flags of foundation, decision, and bureaucracy, respectively. The NSOE should choose the patterns of managerial approach innovation, decision-making mode innovation, and business culture innovation, correspondingly.

### 216 - Towards Some Theory of Technology Orphaning: A Retrospective Exploratory Study ..... 468

P. A. Barbonis

This is a theoretical and quasi-empirical study of a generally obscure phenomenon called technology orphaning. Whilst much has been written on technology and innovation and their adoption and diffusion, scarcely any attention has been paid to technology orphans, which when permanently lost, is a loss to firms, countries and humanity in general. A number of propositions are derived and discussed. Careful management of technology can reduce the number of orphan technologies, which are technologies not available commercially or not commercialized at all, for a variety of reasons. The limitations of the work are discussed, and suggestions made for future work.

### 226 - Managing the Sources of Uncertainty in Technology Projects ..... 473

Terrance M. Skelton and Hans J. Thamhain

A three-year field study into the management practices and business processes of enterprise risk management (ERM) examines the organizational processes and stakeholder interactions of identifying and managing risks early in the project lifecycle and dealing with these risks in an integrated trans-functional way. The results from this field study show that effective risk management involves a complex set of variables related to task, people, and organizational environment. The study provides insight into the type of organizational environment and managerial leadership conducive to identifying and eliminating potential risks by redesigning organizational processes and the project work, and by dealing effectively with the complex social, technical and economic issues that determine the culture and value system of the enterprise.

### 227 - A Model of Co-evolution of Organization Innovation Based on Haier Group in China ..... 478

SHUI Changqing and XU Qingrui

For most organizations, the ability to deliver innovative solutions on a sustainable basis requires them to look within and to renew the fabric of the business itself. There are four important aspects of this internally-focused innovation: Culture – the mindset and norms that allow individuals and teams to think imaginatively, to take prudent risks, and to seek out, create and introduce innovative solutions ; Process – the general business processes and practices that enable functional groups to operate effectively and collaborate toward a common goal – as well as a robust set of innovation methodologies and tools; Structure – organizational structures and supporting technologies that enable collaboration across functional lines; Institution – the rules and regulations about enterprise's routine monument, performance evaluating, staff rewards and punishments, salary system, training and promotion. This paper mainly looked at the first aspect, based on the organization theory and the innovation theory of the firm, from an evolutionary perspective and a case study of Haier Group, addressed a model of co-evolution of organizational culture, business process, organizational structure, institution, and technological innovation .

### 253 - Open Innovation and Technological Learning in China ..... 483

Zhao-hui Zhu and Jin Chen

Facing increasing international competition and globalization, China has experienced two significant decades of economic development; more and more Chinese companies are striding across national boundaries. Nevertheless, the traditional technology innovation strategy characterized by imitation and secondary innovation has some strategic limitations under open innovation. Based on quantitative analysis of the status quo of Chinese firms' international innovation, this paper concludes that balancing explorative learning and exploitative learning is the key of competence, while coordination of innovation assets within the firm is the key of technological learning in developing countries under open innovation paradigm.



## Technology Management and Relevant Competences - Papers Index and Abstracts

### 024 - A PRACTICAL MODEL TO PLAN GROWTH ..... 489

A. S. C. Fernandes

An economic model is described that helps to understand a firm's economic growth. The supporting theory states that the balance between value added and value distributed to labor is the main key to plan growth. The ratio between those two types of value is the knowledge productivity. This factor needs to increase in order to have competitive growth. The paper describes five modeled situations. In addition, a real case of a macro scenario shows approximately the same conclusion as the model.

### 034 - Leadership Competency Assessment of Chinese Technology Entrepreneurs ..... 495

Y.H. Jin, F.X. Lv, and J. Yan

Using two different samples under Chinese setting, this study tested the validity of construct-oriented entrepreneur's leadership competency situational judgment tests (LC-SJT) and compared the differences of leadership competencies between Chinese technology entrepreneurs and middle/senior managers. Results of confirmatory factor analysis supported the three-dimensional leadership competency model. Concurrent validity of LC-SJT relative to self-reported task performance, interpersonal facilitation, job dedication, and overall performance were 0.31, 0.26, 0.44, and 0.42. Chinese technology entrepreneurs performed worse in interpersonal competency, problem-solving competency and overall leadership competency than middle/senior managers; no significant difference existed in character competency. These results suggested the necessity in leadership competency development of Chinese technology entrepreneur to ensure new venture success. Implications of technology entrepreneur research to Chinese "building innovation-oriented country" strategy were also discussed.

### 053 - Putting Competencies into Action in Greek shipping: Implementing a competency typology as a unique source of competitive advantage ..... 499

L. Kyrgidou, A. Papalexandris, K.E. Soderquist, G. Ioannou and G. P. Prastacos

Competencies present the means for creating distinctive competitive advantages. This paper presents a holistic framework for developing practically relevant and theoretically grounded firm specific competencies. It also presents the experience from the implementation of this competency framework at a large international maritime company based in Greece. In this context, the main steps and the critical success factors that characterize such projects are discussed, and relevant examples of findings are analyzed.