



Discover, Transfer, Impact

**BOOK OF POSTER**

**3<sup>rd</sup> Research Symposium**

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Discover, Transfer, Impact





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# BOOKLET POSTER BOOKLET



**CBA**

College Of  
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POSTER

# Study of Trends in Jordan Tourism Literature: A Systematic Review of Tourism Published Research

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## ABSTRACT

For decades, the phenomenon of tourism in Jordan has garnered global attention from researchers. This article fulfills the deficiency of a systematic review of this body of research because of the gap which presently resides in the tourism literature. This article determines the present-day makeup of Jordan tourism literature, including state, gaps, trends, and coherence. 38-tourism-related research articles of 28 various journals from a plethora of online databases are cited in this review. Using a comprehensive classification framework which centers on thematic, theoretical, and methodological aspects, three major points were uncovered: (a) tourist surveys are the primary source of Jordan tourism research; (b) the formerly atheoretical field of tourism research is slowly transitioning to theory-based research; and (c) cross-sectional research design is among the most highly used parts of tourism research in Jordan. The study uses this information to formulate a research agenda that would be largely beneficial to Jordan tourism literature.

## INTRODUCTION

Jordan heavily relies upon tourism's economic benefits. The World Travel and Tourism Council (2015) finds that, in 2014, 23% of Jordan's GDP and over 300,000 jobs were dependent upon this industry.

The nation's government is thus partial to the tourism industry. Plans are specially designed to funnel much of their focus and support to tourism, preserving community involvement in the industry and thereby preventing the numerous problems which neglecting to do so might incur (Alhammad, 2012). The last thirty years of Jordan's tremendous tourism attention has also garnered international attention from researchers.

2005 marked the creation of the Scientific Research Support Fund (SRSF) by the Ministry of Higher Education. It intends to point researchers in the direction of locations and problems whose exploration would most benefit Jordan, with tourism being among its primary focuses.

The quantity of Jordan tourism research that is available is far below necessity. A critical analysis of a body of research can shed light to any important oversights (Dann *et al.*, 1988; Pullin and Stewart, 2006), and it is implied that any observed elision be attempted to be fulfilled. This article represents the only systematic review of tourism research literature in Jordan, offering a critical analysis of the current body of research available and its intent is to strengthen the understanding of Jordan while simultaneously discovering gaps and/or trends present. The discoveries will likely benefit research and practitioners in clarifying the important focuses of the field of tourism research.

## METHODS

## STUDY AIMS AND OBJECTIVES

The focal point of this study is to analyze the current Jordan tourism literature using systematic review methodology in order to provide a deep understanding of this issue. More specifically, the objectives of this study are as follows:

- Explore methodological and theoretical contributions of Jordan tourism literature.
- Identify any methodological, theoretical and thematic trends in Jordan tourism literature.
- Provide suggestions for further research agenda.

## REVIEW METHODOLOGY

This article is qualitative in nature and uses systematic review methodologies. Thoroughness, comprehensiveness, and unequivocalness in interrogation are the hallmarks of an effective systematic review. The main focus of the systematic literature review is to summarise empirical evidences on a particular topic area using an objective and unbiased review procedures (Torricco, 2005). The Figure 1 demonstrates the methodology of choosing articles with the purpose of systematic review.

## ANALYSIS METHOD

Analysis begins by developing a classification framework that allows for a systematic comparison and analysis of Jordan tourism literature based on broad thematic, theoretical and methodological dimensions. The review then carefully analyzed and coded the extracted articles, and summarised their findings using the proposed classification framework. The findings summarised what has been accomplished so far in Jordan tourism literature, and what theories and methods have been used. The findings further reveal how the literature has evolved over time in terms of key thematic, theoretical and methodological orientations.

The thematic, theoretical and methodological dimensions were indicated by research perspective, theoretical framework, conceptual framework, theoretical contribution, research approaches, research design and data collection method. These seven criteria offer useful indications as to the theoretical status and development of Jordan tourism literature.

Afterward, the classification framework was transferred into a detailed coding instrument. The dimensions of the classification framework were converted into layers of coding variables. The extracted articles were coded into applicable coding variables. When coding was completed, an SPSS data file was created and the coded data was processed and analyzed using descriptive statistics such as frequencies and crosstabs. The following section discusses the results and their theoretical and practical implications.

## RESULTS

The researcher grouped the articles found in intervals of five, with six publication intervals overall. Articles published in the first two publication intervals were minimal. The following interval (1997-2001) began to show slight growth. Published articles declined in the fourth interval (2002-2006). Conversely, the fifth interval (2007-2011) demonstrated the most significant increase. The final interval had the greatest increase, accounting for half of the sample's articles ( $n=19$ ).

Four journals were sourced for all the articles. *Annals of Tourism Research* (ATR) and *Desalination* (D), *Habitat International Tourism Management* (TM) were the sources of 28 articles or 34% of the total pool ( $n=13$ ).

24% of publications ( $n=9$ ), appeared in ATR and TM. Non-Jordanian research institutions or researchers of a mixed team wrote all five articles published in ATR. When considering the fact that both journals are specifically focused upon tourism, the conclusion that tourism research institutions are performing under the minimum be made. The researcher recommends that cultivation of collaboration within the nation's institutions foreign research and academic institutions be encouraged. Following are the main findings of the research:

- 1. Research Perspective:** Researchers have performed tourism studies through a plethora of different perspectives, including those of tourists, residents of an area, and members of the service industry. An obvious perspective was used in 58% of publications ( $n=22$ ), 37% in this pool ( $n=14$ ) contained the perspective of tourists, 11% of management ( $n=4$ ), 5% of the local community, respectively ( $n=2$ ). Two operators and four guides made up a single article from the pool.
- 2. Theoretical Perspectives:** In this perspective, theories, models, and conceptual frameworks are used to better the process of investigating and analyzing research. From a research perspective, the theoretical perspective is the most common. Theoretical propositions can be achieved by this kind of perspective, through important and valid analytical methods (Bauer, 2014; Walle, 1997). 42% of publications ( $n=16$ ) explicitly included theories, models, and conceptual frameworks. The remaining 58% ( $n=22$ ) did not utilize theoretical bases for establishing the questions and hypotheses of research.
- 3. Theoretical Contribution:** A theoretical contribution refers to the amount of novel and fundamental theoretical insight contributed to existing literature by tourism publications. The three most common theoretical contributions were: building (Colquitt and Zapata-Phelan, 2007; Wacker, 1998). The first category, exploratory publications deal with the investigation of fundamental facts and parameters while neglecting to contain real theoretical guidance. The category is implemented in the event that little knowledge exists about a situation (Collis and R. Hussey, 2003). The second category, building publications, are exploratory publications that build on the former category, taking pre-existing theories to ground a particular set of prior hypotheses (Colquitt and Zapata-Phelan, 2007; Wacker, 1998). Theory building then takes these theories and utilizes them as the base for an original theory (Colquitt and Zapata-Phelan, 2007; Wacker, 1998). Theory building should include three necessary (yet not conceptual) definitions, domain limitations, and relationship building (Wacker, 1998).
- 4. Methodological Approach:** The researcher categorized publications based on the research approach. 61% of publications used quantitative methods ( $n=23$ ). Meanwhile, qualitative methods accounted for 34% of the sample ( $n=13$ ). A small 5% of publications ( $n=2$ ) simultaneously employed the two methods. The field appears to be of interest to many non-Jordanian research institutions, with 26% of publications having contained research performed in these institutions ( $n=10$ ). In addition, 18% of publications contained research performed in Jordanian institutions ( $n=7$ ) and foreign institutions. This data indicates that almost half of the sample publications were from foreign institutions. By analyzing these two kinds of institutions, foreign and domestic, variation in research methods can be observed. Jordanian institutions leaned toward quantitative methods, while foreign institutions used both kinds of publications (see Table 6). Meanwhile, a small 30% of publications were quantitative in nature (Jordanian institutions ( $n=3$  out of 10).
- 5. Research Design:** The researcher organized the publications in accordance with the adopted research design. Cross-sectional design was the major type of design, making up 65% of the sample's articles ( $n=24$ ). 19% of the sample's articles were case studies ( $n=7$ ), making this kind of research design subsequent in popularity to the former. Following this, longitudinal is the next most popular, making up 13% of the publications ( $n=5$ ). The trend in popularity, experimental design scored as under 3% of the total sample size.
- 6. Data Collection Methods:** The researcher analyzed the publications ( $n=38$ ) with respect to the method. 39% of Jordan's research literature used surveys, making it the most common method of collecting information. Survey data collection in tandem with a secondary method made up 13% of the sample ( $n=5$ ). Subsequent to surveys in terms of popularity, interviews and the analysis of documents were 18% of the extracted sample ( $n=7$ ). A small 10% of publications ( $n=4$ ) used a combination of methods. The lowest scored lowest in terms of popularity, making up 3% of the extraction sample ( $n=1$ ).

## SUMMARY

The researcher systematically reviewed publications from 1987 to 2016 to determine its current state, gaps, trends, and coherence. 38-tourism-related research articles of 28 various journals from a plethora of online databases are cited in this review. An analysis was conducted centralizing around a publication's approaches and findings in terms of thematic, theoretical, and methodological aspects. Key findings in the implications they pose are as follows.

The initial element investigated was research perspectives. Tourist, tour guide, travel agency, local community, and governmental perspectives were used. Most research focuses on the tourist perspective. Meanwhile, tour guide and tourism agency perspectives make up only a small amount of research, a fact which leads to the loss of valuable insight onto those which serve and attract customers of tourism. To bridge this gap in the tourism literature, the researcher recommends an increase in more uncommon perspectives be encouraged and practiced.

Another aspect of tourism literature suffering from deficiency is comparative studies that focus upon the variation in perspectives among tourists, tour guides, travel agencies, local communities, and governments. These studies are imperative to promote the development of Jordan's industry in tourism because of the insights they would offer. Conflicts between these groups require a method of thought which encompasses various perspectives (Al-Hajja, 2011, p. 99). Such an approach must provide better understanding to stakeholders.

## CONCLUSIONS

Subsequent to research perspectives, theoretical issues were observed, including theoretical perspective and theoretical contribution. The former kind was not typically theoretically based, though the regular growth of theory-based research could be observed. In addition, tourism and hospitality models and theories lack support by researchers. The researcher suggests that future studies centralize upon specific tourism theories and models, thereby substantiating and enriching a body of knowledge and tourism research literature.

In the initial part of the twenty-first century, the investigation of water and environmental problems grew in popularity and decreased in use in the next decade. The researcher recommends an increase in studies focused upon water and energy issues in regards to tourism to address Jordan's existence as the second least water-rich country (Al-Momani and Rasheed, 2016, p. 2230).

Following theoretical issues, methodological issues were investigated. Specifically, the methodological approach, the research design, and the data collection methods of tourism research literature were examined. The methodological approach was found to be primarily quantitative in nature. Methodological orientations, however, were found to be less uniform. Jordanian research institutions focus primarily on quantitative research, while foreign institutions used qualitative approaches. The research recommends that the promotion of qualitative approaches for Jordanian researchers occur. Data collection methods, which have recently come to light, including interviews of focus groups, are not popular among Jordan's research institutions and universities (Al-Momani and Rasheed, 2016, p. 2230).

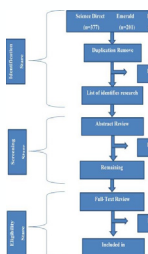
It is implied by the findings of this study that Jordan's education system reviewed to be updated. In terms of research design, cross-sectional research appears to be the most popular. The issue with cross-sectional research is its promotion of data which encompasses more information and less detail. The researcher recommends scholars to begin to utilize experimental and longitudinal designs, among the other less popular designs.

While surveys are the major form by which collecting information takes place, the remaining kinds like those which use observation or focus group interviews are neglected. Because there is a possibility that deficiencies in research fields besides tourism are probable, the benefit of increased research and evaluation of research methodologies would serve Jordán's research institutions in both tourism and other sectors. Moreover, though social media data collection has much to offer tourism research literature, it is completely untapped. The researcher adamantly recommends improving the awareness of this tool for this sector of research.

Lastly, this systematic review only used tourism research which is available online in its analysis of Jordan. This represents a notable limitation. Because such articles were not available online to all researchers, traditionally published, printed journals exclusive to Jordanian university libraries were not able to be part of the review.

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**Figure 1 :The process used in the selection of articles for the systematic review**

# Environment and Organization Learning: Qualitative Evidence from Saudi SMEs

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## ABSTRACT

The focal focus of this research is to provide deep understanding of entrepreneurship practices in the Kingdom of Saudi Arabia (KSA). It aims to explore SMEs learning process in order to explain how SMEs build their capacity and adapt to their environment. Qualitative methodology was employed for this research. In-depth interviews were conducted with 9 entrepreneurs. Interviews were transcribed and analyzed using content and textual analysis. In the light of analysis, a model of SMEs learning process emerged. The study is meant to provide better insights of the way Entrepreneurs manage their SMEs and the main challenges facing them in Jeddah city. The study will provide suggestions for the Saudi government to help in better implementation of 2030 Vision in order to empower local Entrepreneurs and help them to tackle Challenges.

## INTRODUCTION

SMEs, which have limited financial resources, should adapt in order to compete professionally (Zeng et al., 2010). This adaptation can be done through developing organisational learning process in order to detect mistakes and working on avoiding these mistakes in the future. Organisational learning is the organisational practice that aims to create, retain and disseminate knowledge within the domain of an organisation (Drejer et al., 2004).

According to Saudi Vision 2030, the Saudi government considered Small and medium-sized enterprises (SMEs) as the most important agents of economic development and growth because they support innovation, create jobs, and boost exports (Vision 2030). However, the Saudi government is aware of the fact that, SMEs are not yet major contributors to our Saudi GDP. Therefore, Vision 2030 emphasized on creating suitable job opportunities for Saudi citizens by supporting SMEs. (Vision 2030, p. 36)

Small businesses play an important role in term of creating an employment opportunity as they highly depend in labors, supplying large firms with service niche or product that is complementary to their line of production, and reducing the monopoly of the large firms in the market, which leads to economic wealth distribution that impact positively the economy at the country level (Naser et al. 2009; Paola et al. 2014). Gherardi (2015), alleged that the study of female entrepreneurs relatively connected to small firms, family business in terms of family support embedded.

In Saudi, small and medium enterprise contributed about 28 percent of GDP, with employment rate of 80 percent compare to western countries (Danish and Smith, 2012). In fact, Middle East and North Africa MENA presented the lowest rate of entrepreneurial activity globally, with an average of 8.6 per cent for adult who involved in the early stage entrepreneurship (Danish and Smith, 2012).

To contribute to achieving Vision 2030, the learning process of Saudi SMEs must be explored in order to provide deep understanding on how SMEs adapt to its environment.

## METHODS

Since this research is exploratory in nature because little is known about Saudi SMEs, and the available literature does not provide deep understanding of entrepreneurial process, context and causal mechanisms; qualitative methodology is preferred for the purpose of the study, a decision has been made to adopt qualitative methodology for several reasons. Qualitative approach provides better insights into how Saudi SMEs respond to its environmental factors.

Semi-structured in-depth interviews have been found to be effective to explore SMEs owners and managers (Curran and Blackburn, 1994). Interviews were conducted with owners of Saudi SMEs in Jeddah city; owners play the most significant role since they do have the ultimate risk among other stakeholders (Schein, 1983). SMEs owners were selected for interviews using the purposive basis. With coordination with Jeddah Chamber of Commerce SMEs owners were selected. Prior to the interviews, interviewees were contacted and given brief on the research, furthermore, permissions were taken to record interviews. Accordingly, Interviews were transcribed and analysed independently using textual analysis to achieve the study aim and objectives.

Since this research is exploratory in nature and intends to model SMEs response and adaptation to its environment, theoretical sampling was adopted because it is a process in which data gathering is guided by the evolving model and the aim is to develop categories in terms of their properties and dimensions and integrate those categories or relate them to each other within the model being developed (Gentles et al., 2015). The first in-depth interview was conducted and analyzed before the conducting the second in-depth interview, when the latest interview generates new themes and codes for the research another interview was conducted until a new interview did not generate new themes or codes. Nine in-depth were conducted for the purpose of this research.

## RESULTS

In light of the holistic view of the study, themes were extracted using cross-analysis. In light of analysis 61 codes, 13 categories and seven themes were emerged. As shown in figure 1, the Model of SMEs learning and Adaptation, five factors - governmental procedures, Competition, support services, culture, and economic environment- affected the learning process of SMEs. The learning process include identification of capacity needs and then adaptations to deal with challenges and opportunities created by environmental factors.

The main findings:

1. According to Saudi entrepreneurs, the governmental procedures are the biggest and the most influential challenge on SMEs, despite these procedures were developed and revised by the government to support SMEs.
2. Work related cultural values create challenges for Saudi SMEs. National employees have low commitment and do not accept some types of jobs.
3. Nepotism (wasta) culture inforce entrepreneurs to use unethical and illegal practices to sustain their business which also create some situations of miss use of authority.
4. There are some evidences of unfair competition practices that affect SMEs capacity building, such as stealing trained employees which discourage SMEs to offer in-depth training.
5. SMEs evaluate their capacity needs on two dimensions namely, their process and skills.
6. SMEs build their capacity and adapt to their environment through flexibility, innovation and building connections.

## SUMMARY

This study has been conducted on Saudi SMEs in Jeddah, based on in-depth interviews with Saudi SMEs owners and managers a model of SMEs learning process was developed. This model explains how Saudi SMEs learn and adapt to its environment. Based on the finding the study suggested some recommendations to support Saudi SMEs and help SMEs role in 2030 Vision in order to empower local Entrepreneurs and help them to tackle Challenges.

## CONCLUSIONS

Based on the finding of this research, the following recommendations could Saudi SMEs performance:

1. Involve entrepreneurs in governmental procedures revision and rebuilding. Entrepreneurs' benefits and concerns must be taken into consideration.
2. developing and launching awareness campaigns to enhance work related values in the Saudi community.
3. Develop and launching awareness campaigns against Nepotism culture.
4. Developing fair competition code of ethics for Saudi SMEs.

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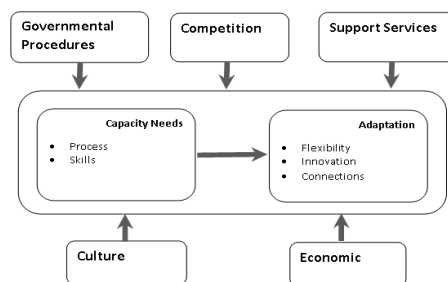


Figure 1. Model of SMEs learning and Adaptation



# IoT implications on Society and Relationship

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## ABSTRACT

Though Internet of Things' (IoT) development ease many aspects of everyday life, unfortunately it comes with set of problems. This paper analyzes the influence of the IoT on society and relationships, specially interspousal relationship. In many countries, divorce rate Skyrocketing, the percentage of legally married couples are declining. Whereas Internet connections(IoT) and internet users are increasing exponentially, Internet connection costs continue to fall rapidly. This paper study the correlation of the IoT and relationships an overlooked area of the IoT. Vulnerability of IoT have been neglected as an area of research, so identifying the different types of IoT implications on society and relationship will assist in the development of an integrated approach to the IoT that will help to overcome or minimize these side effects.

## INTRODUCTION

The Internet-of-Things (IoT) revolves around interconnected devices, systems and services through Internet infrastructure. The IoT's value lies in it being able to capture and analyze the data obtained from the sensors at the endpoints of the connected devices. The ability to put all of this data together means that: IoT can bring considerable benefits to individuals, businesses and society. Although IoT has become an important tool in the society, and in the life of many couples, that facilitate connectivity, coordination, communication, logistics and sharing of information. There are cases where couples negotiate over when and for what to use it, some even include this in marriage contract. A portion of them quarrel over its use and have hurtful experiences. A majority of couples do not share their password and maintain their own separate gadget, email and social media accounts, though a smaller number report sharing accounts.

## METHODS

To address this research question, the study adopted is an explanatory sequential mixed methods design, which integrates the quantitative and qualitative methods during the interpretation phase. The qualitative data collected through open-ended questions and semi-structured interviews were used to "shed some light on the quantitative findings. The qualitative component in a mixed-methods study may help mitigate the negative influence of only collecting data from a self-reported questionnaire.

## Literature Review

Internet of Things is going to change world at a fundamental level, include tracking, control, security, shipping and energy conservation. Figure 1.1 below illustrates the IoT growth. (Nguyen & De Cremer, 2016) Nguyen, B., & De Cremer, D. (2016). IoT initiatives are significant and growing rapidly. For example, modest estimates suggest that there will be over 50 billion connected devices by 2020 (NCTA, 2015 NCTA. (2015). Behind the numbers: Growth in internet of things. NCTA, August 13, 2015. Retrieved January 31, 2016, from <https://www.ncta.com/platform/broadband-internet/behind-the-numbers-growth-in-the-internet-of-things-2/> ). This explosion of connected devices ranges anything from smart phones, tablets and computers to toothbrushes, stovetops, cars and millions of other devices. Despite the overall positive feeling about the IoT's development, many IoT practices manifest behavior that damages or even destroys society and relationships. Indeed, as the IoT relies extensively on delivering information to capitalize on the data supplied, a problem of integrity may emerge. Everyone and everything can be monitored on the Internet. Retrieved January 31, 2016, from <http://www.washingtonsblog.com/2015/03/42846.html> (Google Scholar) notes that from our homes, the Internet allows us to reach out to the outside world, but it also allows the world to reach inside our homes. Such integrity problem poses a major challenge and needs further exploration.

## SUMMARY

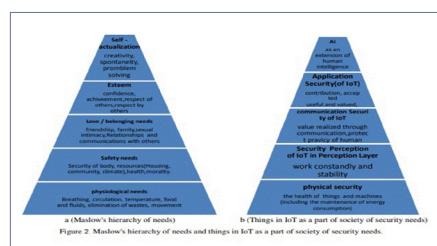
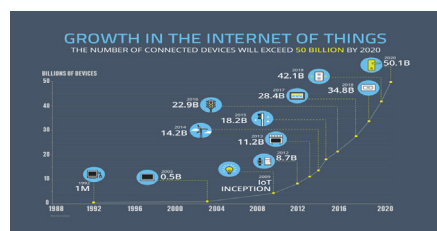
IoT can be misused to monitor activities, eavesdrop conversations and even track their location in real time. As everything from smart cars to smart kettles come online, both the benefits and risks are magnified. The misuse of technology by cheating partners is nothing new. In the pre-internet days, abusive partners would track their target's movements by using telephone records and monitoring car odometers. As technology has evolved so too have the methods, but the underlying motive of control remains the same. IoT as a part of society extension, needs security protection for humanity's sake

## CONCLUSIONS

The subject of the IoT's dark side requires more research, as researchers in particular do not appear to have examined the negative impact of IoT on marriage well-being and divorce rate. Based on an extensive literature review, supplemented by expert insights drawn from the authors' study of the IoT; divorce rate increases with the increase in internet connections, the rate of increase in internet connections and the rate of increase in divorce rate is directly proportional. Though there are many other reasons for divorce, IoT shall be one of the important reasons for this issue. Dysfunctional forms of IoT should not be neglected as an area of research, hence identifying the different types of IoT dark-side behaviors will assist in the development of an integrated approach to the IoT that will help to overcome or reduce divorce rate.

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# Awareness and Use Perception of Consumers towards Complementary and Alternative Medicines (CAM) in Saudi Arabia

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## ABSTRACT

Complementary and Alternative medicines are becoming very popular methods of treatment among the users in the world. As it's have high acceptance to treat many types of ailments which cannot be cured by the modern medicines. In the Kingdom of Saudi Arabia (KSA), this path is also prevailing in the society but due to the lack of awareness and knowledge about CAM, it is not being used properly. Factors it is not adopted properly. In the region, very little studies have been carried out to understand the awareness level, its uses and perception towards CAM among the users. The objectives of the study were to provide an in-depth understanding about females' awareness and perception towards CAM, to identify the reasons for the purpose a survey sample of 120 respondents in Jeddah city at convenience bases were taken during the month of September to November 2016. Data collection with using a structured and close ended questionnaire. The data were analysed using SPSS software and analysed with appropriate statistical tools. It was investigated that the majority of the respondents were aware about the CAM. Its uses and benefits in certain ailments were highly noticed by them. Moreover they were also positive about the benefits of CAM.

## INTRODUCTION

The term complementary alternative medicine (CAM) includes many types of treatments and procedures that are usually not incorporated in conventional medicine. There is a broad range of alternative medicines such as acupuncture, aromatherapy, reiki, massage and so on as seriously considered as a medical form of treatments to help cure health ailments. These alternative medicines are based on irrational belief systems, traditional ethnic systems, spiritual energies, holistic therapy, w/and religion, faith healing and prayer (Islam M-2008). According to Jones (2004) Complementary and alternative medications are the form of remedies that are also termed as herbal or spiritual healing as dukumented by (Kleiner and Welman, 2014).

Compliance of the use of alternative medicine (CAM) is widely used, both in conventional or mainstream health care and as part of traditional health systems and practices (Bodeker et al. 2005). Australian data, published in 2007, reported that 63% of the people had used CAM in the previous 12 months, with 20% of the population reporting to use CAM on a regular basis and a range of other factors (Kue et al. 2007; Alnam M. 2003 ). Those with chronic health issues, such as arthritis, asthma, depression, and chronic pain, were more likely to use CAM (Kue et al. 2006). Most of these studies revealed a surprisingly high predominance and an overall positive attitude toward the use of CAM. For example, a survey conducted by the Centers for Disease Control and Prevention in the United States in 2002, reported that 38% of the population used CAM (Barnes et al. 2003). A study conducted in Ajman, United Arab Emirates, showed that approximately 40% of the population used CAM (Al-Jabri et al. 2007). In the United Kingdom, a survey by Matthews et al., 2013, CAM is widely used for treatment of chronic diseases in many parts of the world. In a study conducted in the Muscat region of Oman, almost half of the patients used CAM therapies for chronic diseases (Al-Sayid et al. 2011). In a study conducted in Malaysia showed that there was a high prevalence of CAM use by the population (Al-Sayid et al. 2011).

The use of herbal remedies is widespread in the Arab world, and Saudi Arabia is no exception to it. Anecdotally, it is considered that herbal products are favourite because of a widespread belief that the preparations are natural and therefore safe. Another important practice in Saudi Arabia shows that the use of natural products is increasing in popularity. This is an area of high concern due to its potential for herb interactions [Al Braik et al., 2008; Al-Infais et al., 2010]. One particular study performed in the Kingdom of Saudi Arabia showed a 68.0% prevalence of herb use in the community, with 80% of the respondents reporting a positive attitude towards the use of herbs, and 70% of the respondents reporting a positive attitude towards the use of 'natural materials' [Al Farsi et al., 2008]. Knowledge and awareness of complementary and alternative medicines have significantly increased in the Saudi Arabia region [Al Farsi et al., 2008]. This has led to an increase in the use of complementary and alternative medicines, and a good knowledge about complementary and alternative medications and about the safety of these medicines is needed. In a study conducted in Saudi Arabia, Al Arabi Rahman et al. (2004) showed that Saudi people tend to use additional and alternative medicines as they feel safe when using natural medicines such as using vitamins and mineral supplements. This is a common practice in Saudi Arabia, and it is a concern for the health care providers and most physicians and the public. This is indicated in a report by the study of National Center for CAM in Saudi Arabia (2010) [Abdullah 2010]. Al-faris et al. (2008) who recorded that more than 70% of the

One of the excellent medical products and growing up market by allopathic medicine today is complementary and alternative medications as indicated by Synovis and Larson, 2013. Almost the last 15 years, there has been a steady rise with regards to global marketing ratio for complementary medicines (Greene, 2016). The CMA industry continues to be profitable as the worldwide annual sales of complementary and alternative medicine (CAM) have increased by 10% over the last 10 years have revealed that the sales growth of these medications has risen from \$5 billion per annum to \$7 billion per annum magnificently (Synovis and Larson, 2013). It has been estimated that over 80% of the world's population is using complementary and alternative medicine (CAM) (WHO, 2013). Saudi Arabia is considered to be one of the fastest growing markets for complementary and alternative remedies and has gained a good ranking on the global marketing platform for these medications (Amin, 2016). The growing demand for complementary and alternative medicine (CAM) in Saudi Arabia will help Saudi Arabia lead the global markets shortly (Parker, 2016). In line with this trend, the present work aimed at studying awareness, perception, and general attitudes about complementary and alternative medicine (CAM) among the Saudi population.

## METHODS

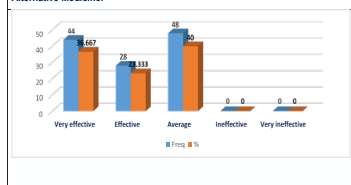
For the study, a close-ended questionnaire from 120 participants was used to capture the data from the respondents that purchased, used herbal medicines and herbal dietary supplements. The survey was done based on convenience sampling method in Jeddah in 2016. The questionnaire involved four parts the socio-demographic characteristics of the buyer, the origin of advice for the advantage of the obtained herbal products, the consumer's attitude towards the safety, of awareness, the effectiveness of herbal remedies and herbal dietary supplements and their combination with conventional treatments, and assessment of the purchased herbal products. The data from each of the recovered questionnaire were coded and entered into Excel, and statistical analysis, JAS and SISA software were used. Moreover, results were summarised using with descriptive statistics as appropriate.

## RESULTS

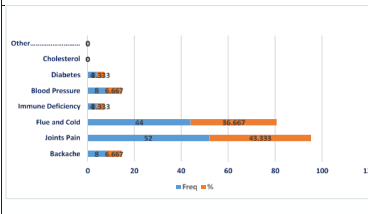
Table 1: Demographic Information of Respondents

	Variables	Freq	%
Age	Below 20	76	63.333
	20-30	32	26.667
	30-40	8	6.667
	40-50	4	3.333
	50 and Above	0	0
Gender	Male	28	23.333
	Female	92	76.667
Educational Level	Uneducated	8	6.667
	Elementary	12	10
	Intermediate	16	13.333
	High School	20	16.667
	Bachelor and above	64	53.333
Total Number of Respondents		120	100

**Figure 1: Respondents Opinion, Regarding The Effectiveness Of The CAM/ Alternative Medicine:**



**Figure 2: Opinion Regarding The Effectiveness Of (Cam) Treatment With Ailments**



**Figure 3: Opinion Regarding The Preference Of This (CAM) Treatment As Compare To Modern Treatment**

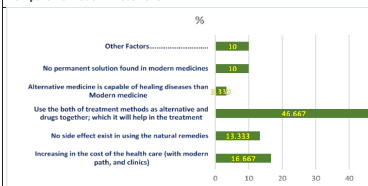
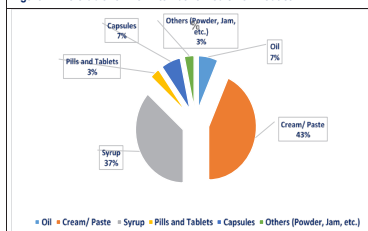


Figure 4: Preferable form of Alternative Medicine Product



## SUMMARY

### Result Discussions:

The study was to understand consumer perception of CAM products in Saudi Arabia with particular reference to herbal medicines. The research study was carried out using three overall objectives. The attributes suggested by the respondent to use herbal products are prepared from the natural ingredient, free from the side effect, fit for health and non-chemical. Most of the respondents mentioned herbal products are made from natural element so they faced no side effect (Kumar & Jangaam, 2011).

From the figure 1, it is indicated that perception regarding the alternative medicines for the treatment is very positive as is observed that majority hundred percent people feel that they have the right to use the alternative medicines. The respondent of ailments, the attitudes towards herbal products (measured on a five-point Likert scale) respondent agreed with most of the statement. It was indicating that respondent hold a positive attitude towards herbal products. Regarding the effectiveness of alternative treatment with ailments, it was observed that respondents agreed on that this treatment is beneficial for joints pain 83.3% followed by back and neck pain 36.6% sachache and diabetes 8% both and diabetes as well as in muscular joint treatment were 3.33% (Figure 2).

The reason for the choosing and selection of CAM / herbal treatment as compared to modern medicines, the majority claim that they were using some time both of the therapy. That helps to quick response on the cure of ailments followed by claiming that ailments were more severe and they selected existing in natural treatment (1.33%). And no permanent solution with modern medicines and other factors were the cause to select this treatment (See Figure 3). Majority of respondents declared that the paste/cream form of the herbaceous product (43%) were preferable followed by Syrup (37%), Capsules and oil represent equally (7%), and Tablets and another form (5%) were preferred each respectively (Figure 4).

## CONCLUSIONS

Despite the high prevalence of herbals, traditional community pharmacies in Saudi Arabia, majority respondents believe that herbal products were a useful therapeutic option and a considerable proportion of people thought they natural and safe in use. The attitude of the respondents towards herbal nutrition and health is also an important factor. The majority of the respondents were of the opinion that they are useful, natural and safe. There are a high level and very positive perception regarding the alternative medicines for the treatment of the majority of the ailments. Herbal products are perceived to be safe and effective. It is perceived that this treatment is beneficial for joints pain followed by flu and cold, headache and blood pressure both and diabetes. The majority pretend that they use herbal products for the treatment of the majority of ailments. The majority of ailments followed by claims that allopath treatment costly and side effect existing in natural treatment and no permanent solution with modern medicines and other factors are the cause to select this treatment. The paste/ cream form of the herbal products is preferred by the majority of respondents. The majority of respondents respectively. It is therefore, recommended from this study that since such a high proportion of the populace use CAM, that at the local, state and national levels should be taken into account when formulating health policies.

The hospital should focus to open the department of CAM-related to specific problems that are highly perceived useful and highly acceptable by the respondents. The respondents are more prepared to use the paste/ cream/ paste/ cream form, Syrup, Capsules and oil for the suitable ailments and age groups. Besides respondents need to be better informed about herbal products which are seeking alternative remedies for chronic health problems and especially

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# Critical success factors for successful ERP implementation in Saudi Arabia

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## INTRODUCTION

Enterprise Resource Planning (ERP systems) are designed to facilitate the flow of information in organisations by integrating data processing and information management activities in the main areas of business.

ERP system are known for their complex implementation and high failure rate. There is increased number of implementation developing countries, including Middle East region.

However, there is a limited research available in the area of ERP system implementation in Middle Eastern countries including Saudi Arabia. This study examine a critical success factors for successful implementation of ERP systems in Saudi Arabia.

## Critical Success Factors (CSFs)

According to Rockhart (1979) the identification of CSFs helps to ensure that those factors receive necessary attention. CSFs are those criteria which should be fulfilled in order for the successful implementation (Bradley, 2008). After extensive literature review, 14 CSFs which were most cited in the literature identified and included in the research for further analysis. These CSFs are reported in the x-axis of Figure 1.

## METHOD

This research adopts quantitative survey research methodology. A survey questionnaire was designed and revised after the pilot study. The questionnaire was sent to the organisations that have implemented or are in the process of implementing ERP system. Considering the nature of study, a convenient sampling method was adopted.

A total of 45 responses were received from the sample. The received responses were cleaned for data analysis. The date was analyzed using Minitab 17.0.

## RESULTS & CONCLUSION

Figure 1 show the average score for each success factor along with the 95% CI. The figure shows that the most critical SF for the implementation success are Interdepartmental communication, Vendor support, Project team competence, and Top Management Support.

Figure 2 show the results of implementing the Varimax factor analysis. Results show that Factor 1 negatively correlates with Careful Package Selection, User training and Top Management Support. While negatively correlating with Business process reengineering and Minimal Customization.

Factor 2 on the other hand mainly shows negative correlation with Interdepartmental communication, vendor support, project champion and project team competence.

It is expected that findings from the study will enable implementing organisation to better understand the role of CSFs during implementation and plan a strategy for successful implementation.

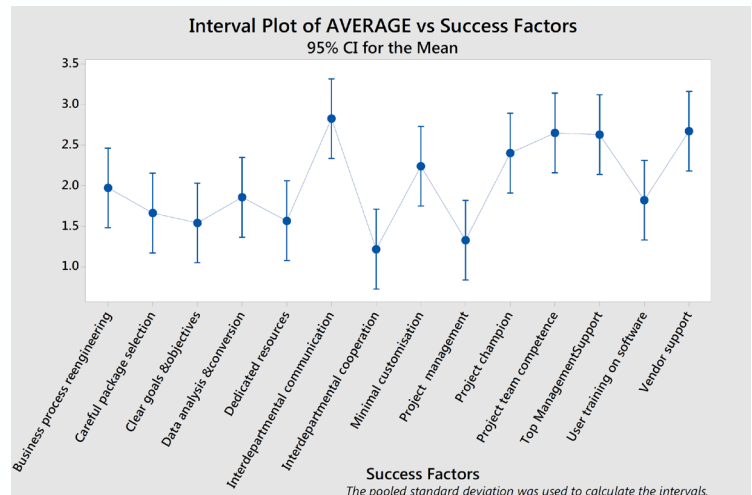


Figure 1

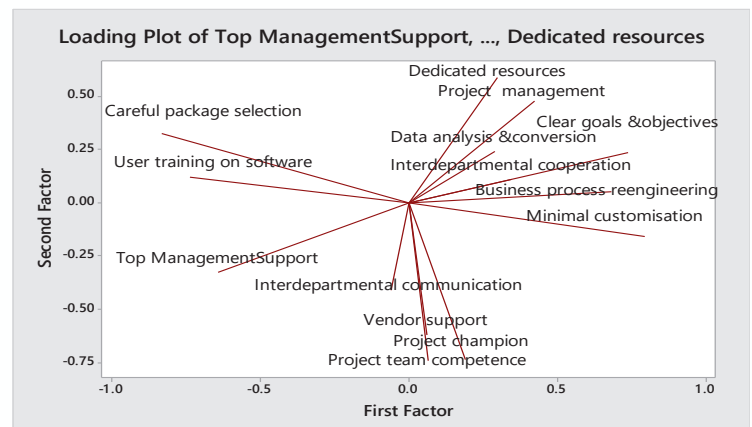


Figure 2

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# THE STUDY TO INVESTIGATE RECYCLING BEHAVIOUR CHARACTERISTICS OF RESIDENTS OF JEDDAH

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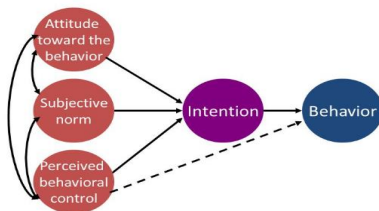
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## INTRODUCTION

THE GROWING ECONOMIES IN DEVELOPING COUNTRIES AND INCREASE IN CONSUMER SPENDING HAS DIRECT IMPACT ON THE WASTE GENERATED. AS THE INCOME INCREASES, THE CONSUMPTION PATTERN OF THE PEOPLE CHANGES (MEDINA, 1997). THIS IS MORE REFLECTED IN EMERGING ECONOMIES WHICH HAS SEEN CONSUMER SPENDING INCREASING MANIFOLD, RESULTING IN INCREASE IN HOUSEHOLD WASTE INCREASE. THIS IS COUPLED WITH THE RISE IN CONSUMERS AWARENESS TO SAVING ENVIRONMENT AND GOING GREEN BY MINIMIZING WASTE DISPOSAL AND ADOPTING RECYCLING PRACTICES.

## THE THEORY OF PLANNED BEHAVIOUR (TPB)

### Ajzen's Theory of Planned Behavior



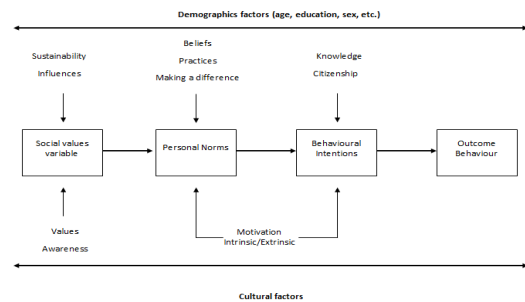
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THE THEORY OF PLANNED BEHAVIOUR (TPB; AJZEN, 1991) PROVIDES A FRAMEWORK FOR SYSTEMATICALLY INVESTIGATING THE FACTORS WHICH INFLUENCE HUMAN BEHAVIOURAL CHOICES.

## VARIABLES OF INTEREST

- i. Knowledge
- ii. Demographics
- iii. Social Variable
- iv. Culture
- v. Reward
- vi. Situational Variables
- vii. Responsible/Good Citizen Attitude

## PROPOSED CONCEPTUAL FRAMEWORK



## METHODOLOGY

This research adopted quantitative research method using questionnaire survey for data collection.

The questionnaire is derived from literature review and theoretical framework.

The questionnaire is prepared in both English and Arabic to cover wider audience.

Currently, we are in the process of data collection.

## CONCLUSION AND FUTURE WORK

THE ABILITY OF THE TPB TO UNDERSTAND HUMAN BEHAVIOUR MAKES IT USEFUL TO ANALYSE, PREDICT AND CHANGES TO PRO-ENVIRONMENTAL BEHAVIOUR AND TO DESIGN PROGRAMME TO PROMOTE PRO-ENVIRONMENTAL ACTIVITIES.

ONCE DATA IS COLLECTED, IT WILL BE ANALYSED USING SPSS TO STUDY THE RELATIONSHIP BETWEEN DIFFERENT VARIABLES.

IT WILL ENABLE RESEARCHER TO FURTHER UNDERSTAND THE IMPACT OF VARIABLES AND THE STATE OF RECYCLING IN CITY OF JEDDAH.

THE FINDING WILL ASSIST IN DEVELOPING THE STRATEGIES TO IMPROVE RECYCLING PRACTICES AND ENCOURAGING CITIZENS TO REDUCE WASTE AND SAVE ENVIRONMENT .

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# Strategic Human Resource Management: At SOCAR Company

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## ABSTRACT

This study examined whether SHRM is applied, and to investigate this study qualitative method of data collection was used to generate the data required to achieve the objectives of the study. Inter-views were conducted with Heads of resourcing, Training & Development, Employee Relations at two oil companies. The findings show that SHRM is applied at these companies. Foreign-based company, is more experienced in SHRM. However, SOCAR considers the importance of SHRM and differentiates it from administrative HRM or Personnel Management. For this purpose, new policies and systems are being created for the application of more strategic HRM. HR is involved in strategic and business planning at both companies. The study also reveals that HR strategy is part of business planning and strategy and that these activities are always coordinated to make a contribution to the overall organizational goals.

## INTRODUCTION

Human capital, skills and knowledge of individuals is considered essential elements for an effective organizational performance. Researchers indicate that Human Resource Management (HRM) is the most important determinant of organizational success (Schuler, 1992). The growing importance of human resources for organizational success has led to an increasing interest in making personnel management a more integral, strategy-driven activity in organizations. Thus, the most successful companies focus on strategic implementation of human resources practices linked with overall organizational strategy, goals and objectives. The strategic human resource management approach has a number of key dimensions. It requires that human resource management be integrated with corporate strategic issues. This integration has implications for the involvement of different parties in shaping the framework in which human resource management policies are developed. Researchers indicate that decisions made at the most senior levels of the organization shape the corporate and human resource management strategies and policies of lower levels of the organization (Kromar, 1992). Empirical studies have found that organizational performance depends on how human resources practices are linked with the strategy and give contributions to the overall organizational goal. Becker and Huselid (2010) indicate that a company gains success when it adopts recruiting and selection systems consistent with its competitive strategy, such as reward systems that reflect successful strategy implementation performance appraisals and employee compensation

## METHODS

Given that this research is exploratory, qualitative method was used to investigate this topic. Exploratory research is conducted for deeper understanding of current situations in companies. This method is suitable when there is lack of existing research and theories. Qualitative method is the most preferred technique for such exploratory research. This method enables the use of many open-ended questions in interviews, which is helpful to gain detailed data. As a research instrument, face-to-face interview was conducted. The interview questions are open-ended questions. This enables interviewees to describe the situation in their own way, and also creates an opportunity for mutual discussion about events. The data collection is based on primary and secondary sources from two oil companies (SOCAR). Primary data includes the answers to the interview questions obtained from members of the subject companies. Secondary data includes reports, policy statements, formal written documents and company regulations. The data sampling process depended on the level of access to the organizations to enable research to be conducted. As the access to the organization is very important in qualitative methodology the target companies were selected based upon accessibility. One of the authors for this study was awarded a scholarship by SOCAR (a national Oil company) to study HRM. This relationship has enabled access to the company to obtain relevant data.

## Literature Review

Researchers distinguish between Human Resource Management and Strategic Human Resource Management. The distinction is intended to differentiate between conceptions of human resource management as functionally or administratively-oriented activities as opposed to integrated or strategy-driven activities. This differentiation is expressed by some researchers in a different way. For example, Schuler (1992) assumes that SHRM is a style of HRM and links the organizational strategy with HR practices that are accepted and used by line managers and employees as a part of their work. Other differentiation is based on the traditional HR objectives, such as turnover or performance, which are superseded by organization- wide goals designed to complement a specific business strategy. However, some researchers argue that SHRM and HRM are synonymous (Maybe et al, 1998)

According to O'Reilly et al (2000), employee attitudes and behaviors are created by considering personality, value and beliefs, rewards, roles, organizational culture and backgrounds. He argues that attitudes and behaviors can be managed only through selection, while the rest are managed by designing the context. The context is managed through vision and values, recruitment and selection, participation and involvement, team/job design, long term perspective, training and development, psychological ownership, symbolic management, measurement, information sharing and rewards, benefits and compensation.

HR practices have to contribute to overall organizational goals by cooperating with business strategy. How does the business strategy of the company impact on HR practices? Researchers indicate that companies with innovation strategies apply the following HR practice (Armstrong, 1992; Schuler & Jackson, 2007). Individual jobs need close interaction among people to enable employees to develop their skills, which can be applied in other positions.

Dolery & Doty (1996) suggest that the HR systems of a company have to achieve both vertical and horizontal integration. Their categories of 'defender' and 'prospector' are derived from 'internal systems' or configurations of HR practices that maximize horizontal fit, and then link these to strategic configurations of, for example, 'defender' or 'prospector' to maximize vertical fit. The table below presents different HR practices suggested by Dolery & Doty (1996). Schuler and Jackson (2007) argue that this approach makes complex organizational content to be reduced to a few possible configurations for the sake of manageability.

HR Practices	Internal career opportunities	T & D	Performance management	Role of HR
<b>Defenders</b> Low-risk strategies Secure markets Concentration on narrow segments Focus on efficiency of systems	Sophisticated recruitment and selection systems Built talents and skills Career development opportunities Retention of key skills valued	Focus longer term Development for the future and emphasis on learning	Appraisals development oriented Clear grading structure and transparency valued Employees share schemes	Potential for strategic role Well-established department, with established HR systems
<b>Prospectors</b> Innovative High-risk strategies Change and uncertainty Focus on entering new markets	Buy-in talent and skills Limited internal career paths	Focus short-term skill needs Ours on individual to take responsibility for personal learning and development	Appraisals results-oriented Reward short-term, and incentive-based Performance-related pay based on bottom line measures	Administrative role Supportive role

Source: Dolery J and Doty H. (1996)

## SUMMARY

This study investigated the implication of SHRM at SOCAR, and revealed that the HR strategy is understood at SOCAR on a satisfactory level. Although the HR department and the concept of HR are new to the company, the head of departments tried to explain HR strategy and the contribution of the different practices to the HR strategy and business clearly. According to the head of Training and Development, the HR strategy of the company is to attract new employees from the young generation. He stated that the majority of the company employees consist of old aged people. These people are not appropriate to compete in the market and in a flexible environment. The head of Recruitment department, stated that the HR strategy of the company is to provide a system that is based on transparency, dignity and integrity in order to provide training opportunities and work and life balance in the company. The creation of new HR departments will serve to improve the effective application of new HR policies and practices and provide effective implementation of strategic HRM. The implementation of a new system is difficult because of the size and structure of the company.

## CONCLUSIONS

The study confirmed that SHRM is different from traditionally applied HRM. Strategic HRM is more aligned with business strategy and different from administrative HRM. The study also confirmed that integration of HRM practices with business strategy is a more effective approach to SHRM. Further, the findings in the study strongly support the impact of culture, size and structure, industry on HRM practices. Thus, the findings of the study contradict the universalistic approach in SHRM.

The study reveals that some of Head of HR are not aware of the business strategy. HR people have to be familiar with the business strategy, policies and procedures. They have to get broad information about organization and how it operates. Employee awareness of business strategy is more important. This integrates employee behaviors with the strategy. In BP, it is not the case, but in SOCAR this is strongly recommended to achieve organizational goals. Employee behaviors have to be integrated with business values and strategy. From the recruitment and selection

process, this has to be coordinated. Taking the business strategy into account, certain employees with required skills and competences have to be recruited.

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# The role of Hay Group system for determining Total Rewards

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## ABSTRACT

This paper aims to show what total reward models were brought on the market in the recent years and what they require. What we expect and what do we get? This is a good question for employees nowadays. Companies can use a salary package with standard wages and compulsory benefits required by law, or may grant other benefits and rewards for its employees to get the highest quality, to maintain the workforce and to gain employee's loyalty. However, the success of a total reward approach relies upon, both the organization clearly communicating what it is trying to achieve, and the ability to actively engage and motivate their teams. Granting rewards and benefits for employees in a company it is limited by the paying budget. The budget is decided by top management. Therefore, the needs of employees must be related to the company's financial resources. During the past few years there have been created rewarding models that illustrate how rewards are granted to the employees. These models may be general or more specific for the companies for which they were designed. This paper aims to analyze what appeared in the literature in terms of reward models, showing the influence of the total reward strategy in companies and inducing steps to follow for implementing a total rewards model in companies.

## INTRODUCTION

Reward strategies must be fastened in business reality to be operative. Which means involving it to one's business strategy and the needs of one's employees as well as one's organization. Hay Group Total Reward Framework helps in enhancing reward, no matter how challenging the circumstances. In general, the using of total rewards rises the value of the companies for the shareholders. Whether it is about clients, vendors, business partners or employees, rewarding workforce accordingly to their expectations and performance as well as brings added value to the final product of the company. Committing total rewards in the corporate area helps to increase the volume and quality of work, commitment and loyalty of the staff. The final customer of products or services will be better preserved and pleased. The profit and the company's image will be at least constant if not growing. The implementation of total rewards in firms it is not as easy as it seems. The principle it is reliable and logic it starts from the mandatory rewards, required by law, and then there are considered the needs of the employees and the company's budget to determine what company can provide. The implementation of rewards into companies are achieved through total rewards illustrations.

## METHODS

This research is a systematic procedure used to gain more knowledge on how a reward and recognition impacts upon an employees' motivation in the workplace and this section focus on the methodological approaches used throughout the study and justifying why the methods and approaches were chosen.

The type of the research topic under investigation will determine the choice of research design approach you take. In this case, there is ample published literature available to support this research topic. From here the research design can begin and research questions developed. According to Thietart et al., (2001), it is advised to establish a clear and transparent research design before you move to your data collection stage as to collect data before you know how you will analyse this data may make much of the data not applicable. This is very important as the data collection method in this research is semi-structured interviews and the researcher did not want to lose any opportunity for collecting the most relevant data.

In order to gain more general information about the topic in question, semi-structured interviewing was chosen to gain the maximum amount of feedback and in line with the inductive approach.

## Literature Review

At the end of 1990, Hay Group has developed a total reward model based on the opinions of their employees. To define this model were used transactional rewarding, interactive rewarding and everything that convinces employees that their work it is part of lofty standards (Armstrong, Murlis, 2009). The research results for employees from the United Kingdom and other company sites revealed that for choosing a job on long-term orientation with the organization, inspiration and values of the organization are most important for employees. On the second place are situated future growth opportunities and just on the third place are tangible rewards.

The Hay Group Total Reward Framework takes strategy as a starting point and it focuses on total reward: every financial measure together with non-financial rewards too. It also considers the needs of both company and employee: an even, balanced approach ensures the company's interests are catered for, while ensuring employees are engaged & motivated.

Rewarding strategy aims to attract, motivate and maintain human resources. It interacts more with the company's external environment when there are recruitment and selection processes, but also needs the information within the firm to determine competitive salary packages compared to those offered by other companies from the market. Rigorous background, continuous information about the labor market and knowing the legal benefits are examples of activities that ensure that a strategy can be successfully implemented.

Research shows a relationship between reward communications effectiveness and employee engagement and business results. Heneman and McInerney (2002) found a positive correlation between the amount of knowledge employees have about their reward program and their satisfaction with their job and the organization. Studies conducted by both Hay Group and Towers Perrin found that the most effective organizations provide reward information more frequently and in greater depth than other organizations (McMullen, Stark, Royal 2008 and Gherson 2000).

## SUMMARY

Research shows a relationship between reward communications effectiveness and employee engagement and business results. Heneman and McInerney (2002) found a positive correlation between the amount of knowledge employees have about their reward program and their satisfaction with their job and the organization. Studies conducted by both Hay Group and Towers Perrin found that the most effective organizations provide reward information more frequently and in greater depth than other organizations (McMullen, et al., 2008 and Gherson 2000).

A lot of examination has been shown throughout a cautiously instable period which might had tending to significant outcomes, it is suggested that it would be frequent in the formula of the research to limit the influence of changing rewarding likings on a continues job involvement.

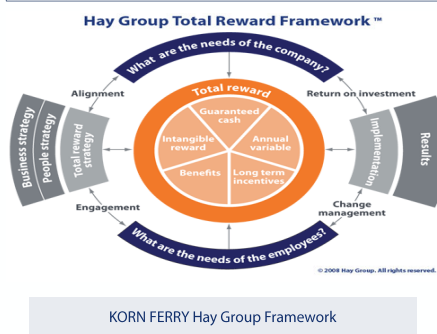
## CONCLUSIONS

This study had providing a very valuable vision that could support organizations in scheming their overall rewarding representations as portion of their involvements plans and curricula.

Companies can use a classical salary package with standard wages and compulsory benefits required by law, or may grant other benefits and rewards for its employees to get the highest quality, to maintain the workforce and to gain employee's loyalty. However, expectations of human resources are different and are depending on: gender, age, marital status, family, ambition, results at the working place. Granting rewards and benefits for employees in a company it is limited by the paying budget. The budget is decided by top management. Therefore, the needs of employees must be related to the company's financial resources. During the past few years there have been created rewarding models that illustrate how rewards are granted to the employees. These models may be general or more specific for the companies for which they were designed. This paper aims to analyze what appeared in the literature in terms of reward models, showing the influence of the psychological contract in companies and inducing steps to follow for implementing a total rewards model in companies.

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The model has six variables of interest: quality of work, personal life- work balance, inspiration and values of the organization, working environment, future growth opportunities and tangible rewards. Each of these consists in other subordinate variables. Personal life- work balance can be considered when it is offered flexibility for working hours or when are fulfilled other needs

The Hay system is comprised of three factors, which include the know-how, problem solving and accountability. All these factors contribute to determining the best total reward for employees in the organization.



# "Impact of Social Media and its Influence on Purchasing Behavior of Saudi Consumers: An Empirical Study"

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## ABSTRACT

Social networks have inspired millions of users around the world. Besides, this new means of communication win consumers' trust by communicating with them at a deeper level. In addition, as local and international marketing companies have recognized social networking as a potential marketing platform and have used innovations to drive advertising campaigns and marketing approaches through social networks. One cannot stand on the lack of social media channel now that their counterparts have waves of products and services on the market. Despite the proliferation of social networks and the widespread dissemination of different communication tools, very few studies in the Arab region describe the objectives of the current study. The rationale for this article is to explore the mechanism and determinants of these media and factors that affect the purchasing behavior of the Saudi consumer. Throughout Sample of 226 via Google forms and monkey survey (online) using close-ended questionnaire with handling particular attention to reducing non-response error was given in the study. For descriptive analysis (frequency distribution statistics), the hypothesis test Chi-square goodness of fitness test at P. Value 0.05 was applied, and the results were interpreted accordingly in the study. It is found that there is variance among the respondents in time duration spent on social media and purchasing preferences within the social media platform.

## INTRODUCTION

The wave of social networks has changed the way of communicating and interacting with consumers. This is because social networks allow people from all over the world to interact and exchange products and brands information with each other (Mir & Zaher, 2012). According to Kaplan and Henlin (2010), social networking is a term that can be represented as a set of Web applications and Web 2.0 technologies that allow users to create modify and generate content. In fact, social networks have become an essential part of our daily lives (Kaplan et al., 2012). In addition, in the technology-driven world today, such as social networking sites have become a way for retailers to expand their marketing campaigns to a wide range of consumers.

Users of social networks can easily exchange information about products. At the same time, consumers can also "consult with the social community to seek advice on purchasing decisions. Through social communities, consumers can influence purchasing decisions in much more substantial populations (Liang and Turban, 2011); social trade has the potential to become a significant sales channel in the future (Pricewaterhouse Coopers, 2013).

On the other hand, it was noted that the number of Internet users is growing significantly more than 3 billion users estimated worldwide (Internet Statistics, 2014). Moreover, in the same time in Saudi Arabia, the Internet users have the record of the second largest region in the Middle East; it is about 66% in Saudi Arabia (Internet Statistics, 2014). Other statistics revealed by the Ministry of Communications and Information Technology in Saudi Arabia Saudi Arabia that there are higher than 7.6 million Facebook users, more than 5 million Twitter users, more than one million LinkedIn users and more than 290 million daily visits on YouTube (http://www.mci.gov.sa/). Saudi Arabia people spend an average of about 8 hours a day on various networking sites, and social networks have become part of everyday life for most Saudis, according to all of these statistics to the high prevalence of the internet, social media and other media in Saudi Arabia. With more and more convenient to use social networking, communication and communication methods are complementary. Communication between companies and other consumers may also be affected (Lee and Kim, 2014; Al-Qeisi, K., Dennis, C., Hegazy, A., & Abbad, M, 2015).

### THE RESEARCH RATIONALE:

Although social networking in Saudi Arabia is among one of the highest numbers, use in the world, but we do not find vital research to explain the reasons for user acceptance and impact and the impact of social media in this segment. Preserving the mind that increases the use of social networks by Saudis, primarily by young people, the rationale for this article is to explore the mechanism and determinants of these media and factors that affect the purchasing behavior of the Saudi consumer throughout.

### OBJECTIVES OF THE STUDY:

- ✓ To understand the time duration spent on social media among the respondents.
- ✓ To know the purpose involvement on of social media
- ✓ To find out the types of product buying preferences through social media among the respondents
- ✓ To identify the purchasing intention through social media among the respondents

## METHODOLOGY OF RESEARCH

The examination of this study intends to identify the ideas, preferences, perceptions of Saudi clients towards social media. The study community consists of users of social networks in Saudi Arabia. Moreover, to answer the research, question a primary data collection was used addressing the specific issues to consumers about their use of social networks and how these media influence decision-making processes specifically. Since access to the internet is a necessary condition for social media use and keeping internet popularity in mind, online surveys have been adopted to obtain the data. An appropriate sample survey has been gathered from 226 users and structured (close-ended questionnaire) through Google Forms, Monkey Survey. The link was sent through email, WhatsApp, Facebook and some other social networking sites for the purpose. After data collection, it was edited, coded and recorded and result findings were described accordingly. Besides, special precautions were taken to reduce the rate of non-response error. For the analysis a descriptive statistics (frequency distribution) and for hypothesis testing, chi-square goodness of fitness test at 95% of a certain level (P. Value 0.05) was applied.

## LITERATURE REVIEW

Social contacts have revolutionized the way people communicate and maintain relationships. Social networks should begin to influence what consumers buy and how to buy (Booz & Company, 2011). It was revealed that social media has indeed done a commendable job of bridging the communication gap among people. Moreover, the different social media tools help the people to interact with one another within the shortest possible time (Alam Z M., 2017). A recent study by Duggan and Brenner (2013) found that 89 percent of Internet users spent nearly three hours a day on social networking sites on Facebook to communicate with friends. In the same study, nearly 76% of respondents (Internet users) revealed that for information about products and services; spend about four hours on social networks. Social networking platforms such as Facebook, Twitter, Instagram, YouTube and other activities have begun to transform business activities such as marketing, advertising and promotion (Hanna, Rohm, & Crittenden, 2011).

Moreover, it was indicated in the study that the most preferred medium of communication to promote the products are social media, followed by emails communication, television commercial and SMS by the consumer (Alam Z M, 2017a). The rapid growth of online shopping, some retailers that sell goods and services online and it became the primary channel to expand the market locally and internationally (Alam Z M. and Elasi, 2016).

According to the Saudi newspaper, a recent study on social networks in the Arab world has been published. In this report, Saudis are the most active users of social networks in the Arab region, with an estimated 393,000 Twitter users and 4 million users. Fatany, (2012) revealed that Saudis are among the most prolific users on Facebook and Twitter, benefiting from the independence and freedoms offered through social networks. Many Saudis around the world use social networking with joy.

## RESULT ANALYSIS

Figure 1: Respondants time duration spent on social media

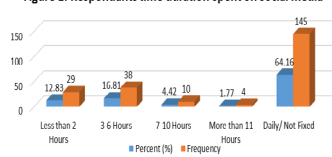


Figure 2: Purpose of involvement on social media

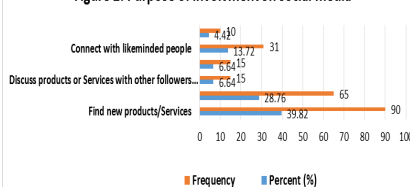


Figure 3: Respondents Product buying preferences on social media

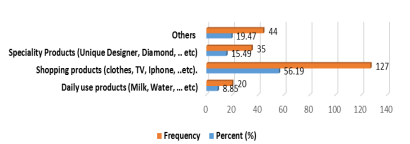
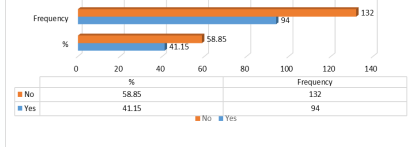


Figure 4: Product purchasing intention through social media in future



## RESULT SUMMARY

Demographic factors such as gender, age, city, educational level, job Status and their monthly income indicated that the majority of respondents of the study belongs to male 151 (67%) and female 75 (33%). Most of the respondents reported they belong to in the range of 20 to 39 (75%) age group of the sample of the study. Moreover, it is revealed that most of the participants belong to the different 22 cities of KSA (51%), capital city Riyadh (26%) and the rest were from Jeddah industrial city that is 23% of the sample surveyed. Regarding the educational level of respondents most of them graduate 31% were graduate followed by undergraduate 27%. Figure 1 provides the information regarding the preferences in times duration spent on social media. It reveals that majority of respondents about 64.16% of the sample spending their time usually daily and it is not fixed how much they are involved in the social media use followed by 3-6 hours (16.81%). From the result it is indicated that almost one-fourth of their daily times they are engaged with social media. Regarding the purpose of involvement on social media, it is revealed that high percentage (56.82%) of the respondents expressed that find the new products/ services information was the principal purpose of involvement with the social media as a consumer perspective. Followed by finding out the information about a specific products/ services (28.76%), connect with like-minded people (13.72%). In another view, it can be stated that about around 82% of the respondents indicated that they are anyhow involved with shopping and consuming elements (See figure 2). From the figure 3, it is perceived that majority (56.19%) showed their preferences on buying the shopping products such as a clothes, phones, T.V., etc., followed by other products about 19.47%, specialty products like unique, designer items, other product, specialty products (15.49%). When respondents were asked regarding the product purchasing preferences through social media, the majority (58.85%) of them agreed that they prefer the purchasing products or services through social media followed by 41.15% declined that they will not prefer to buy product or services through social media (Figure 4).

## CONCLUSIONS

A careful analysis of the data are mentioned to increase the knowledge of the reality that the social media has already done a commendable job is to close the communication gap between people. The different tools of social networks help people to interact with each other in the shortest possible time. The result indicates that the majority of Saudi consumers utilize social media spend time between one hour to six hours and it is about a quarter of the daily time spent by them. Therefore, we can say that marketing professionals can use these means of communication that can be a suitable and sufficient communication method with the consumers in the region. Regarding the purpose of participation in social media/networks, it is observed that approximately 82 percent of respondents are involved in the purchase and consumption of products. Moreover, it is a good indicator for the seller to call concerning business and promoters with shoppers, which will be highly efficient as majority shows their interest in involvement with consumption-related issues. Excellent time to approach the client in the evening, at night and before bedtime are appreciated that the seller who sends their message in the afternoon compared to the hours of sleep (Alam Z M., 2017). The seller who sells shopping products such as textiles, telephones, television, etc., have a very positive opportunity to sell their products or services through the social media platform since these products are preferred to a large extent compared to other types of product categories. Concerning specialty and daily use items, there is a need to create awareness, and it should be sufficient to make a comparison between the products and generate trust among the target consumers. Concerning the intention of buying products through social networks, the proportions of positive comments are almost equal to what is compared. Therefore, it is vital that the seller to be able to offer the current best service to loyal customers, and they can lure the customers through using cyber bait and some other incentives to them who is still not interested to prefer social media as a purchasing/ buying spot for goods and services.

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# EFFECT OF ORGANIZATIONAL ROLE STRESS ON ORGANIZATIONAL CULTURE: AN EMPIRICAL EVIDENCE FROM SERVICE SECTOR

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## ABSTRACT

Organizational culture has been characterized as support linkages between technology adoption and organizational growth; it can be a critical success factor in organization growth strategy and play a crucial role in determining the success or failure of organization. Organizational role stress comes from three sectors i.e. job and organization, social factor and intra-psychic factor. In fact, as the role is more or less and most of the times defined by the expectations of the role senders, the expectations on the

other hand can remain ambiguous conflictive to each other, unless integrated, shared or articulated in right manner other wise could be very problematic. This study will examine the impact of organizational role stress on OCTAPACE Culture and to offer suitable suggestions to stake holders for reducing the organizational role stress and make better OCTAPACE Culture in service sector. The present study was conducted on 474 employees of organized service sectors like retail and telecom randomly drawn using questionnaire method. The results obtained indicates that the employees were experiencing moderate level of OCTAPACE culture and components includes Openness and Risk taking, Confrontation, Pro-action, Collaboration and Experimentation. Organizational role stress were also found to be at moderate level and dominant stressors like Role erosion, Personal Inadequacy, Role expectation conflict and self role distance were found a bit high. Significant difference were also observed on few demographic variables as well. It was further explored and found that there is significant negative correlation exists between OCTAPACE culture and organizational role stress.

## INTRODUCTION

In an organization, stress can be defined as mismatch between abilities and skills of a person and what his job demands. According to French, Rogers & Cobb, 1974 as a misfit when a person's job environment is insufficient to fulfil his needs. In 1975 Caplan et al. defined organizational stress and said that if any threat is posed to an individual due to his job environment then it can be termed as organizational stress.

The role stress was classified under 3 categories by Kahn and Quinn (1970). (a) Expectation which generates stress-which includes role conflict and role ambiguity (b) Expectation resource discrepancies-which includes role overload, responsibility, authority dilemma and inadequate technological information, and (c) Role and personality. Pareek (1993) identified the ten stresses in relation to organizational roles:

Organizational culture is values and behaviors that contribute to the unique social and psychological environment of an organization. According to Schein (1992) "Organizational culture is the "basic assumptions and beliefs that are shared by members of the organization. Culture is considered as an internal variable meaning that it is something that organization has." Organizational culture includes an organization's expectations, experiences, philosophy, and values that hold it together, and is expressed in its self-image, inner workings, interactions with the outside world, and future expectations and it is based on shared attitudes, beliefs, customs, and written and unwritten rules that have been developed over time and are considered valid.

## METHODS

### Methodology:

### SAMPLE:

Considering the current sector and availability of the data this study was conducted on 495 randomly selected employees of organized service sector spread in north part of India. After scrutiny of the filled data 21 questionnaires were rejected because of various reasons like incomplete information, wrong entries etc. The remaining 474 cases were used in this study. The respondents were divided on the basis of gender, designation etc.

### PROCEDURE:

Data was collected by survey method from respondents with more than two years of experience. The respondent from each organization was provided with intent letter for the purpose of research and access. Once permission was granted, the questionnaires with a participant information sheet were distributed in either electronic form or in hardcopy to employees. They were asked to properly go through the instructions and fill the form at the work place itself

### TOOLS USED:

Questionnaire method was used for the current research using two standardized psychometric measures and the details of them are as follows:

Organizational Culture: Pareek and Rao (1993) developed OCTAPACE profile of 40 items instrument that gives the profile of organizational ethos in 8 values is used in the study.

Through this questionnaire respondents can check actual and desired or ideal profile of an employees' required by organization. It helps to check the extent of their importance or sharing in the organization, the respondent can also check how much they should be valued, or how much beliefs are useful. The reliability and validity of the scale is within acceptable norms.

## Literature Review

Zafar et al (2017) conducted a study on 436 employees of organized service sectors randomly drawn using questionnaire method and found that the employees were experiencing moderate level of OCTAPACE culture and also moderate level of job satisfaction and dominant culture components includes Openness and Risk taking, Confrontation, Pro-action, Collaboration and Experimentation. It was further explored and found that there is significant positive correlation exists between organizational culture and job satisfaction. Click to Add text

Zafar and Nazneen (2016) conducted a cross cultural study on 245 Faculty members working in various Indian and Saudi Arabian universities using questionnaire method and standardized psychometric tests were used to collect the data on the variable under investigation. The study reveals that faculty members of Saudi Arabia were shown moderate level of organizational role stress and low level of organizational commitment while their Indian counterparts were shown high level of organizational role stress and moderate level of organizational commitment. The organizational role stress dimensions were found to be negatively correlated with organizational commitment means if the organizational role stress will go up the commitment level of the faculty members will go down and affect the performance of the faculty members negatively.

Sabherwal et al (2015) analyzed 200 faculty members of different higher educational institutions in Pune and found that the determinants of stress among the administrators are numerous and varied, with compilation of results, time pressures, lack of infrastructure, student's indiscipline and poor pay prospects as very high ranked stressors. The findings also revealed that the administrators experienced, on an average a low to moderate level of stress and this did not negatively affect their performance.

the employees of service sectors are experiencing moderate level of organizational role stress and leading stressors are Personal Inadequacy, Self-Role Distance, Role Erosion, Role Expectation Conflict, and Role Stagnation respectively contrary to the findings of Bhalla et al (2013)

The employees of service sectors are experiencing moderate level of organizational culture and dominant factors includes Experimentation, Confrontation and Openness.

Male service sectors employees are showing significantly high level of organizational role stress than their female counterparts and the difference is significant at .01 level of significance. Significant difference of mean were also found on the dimension of role erosion, personal inadequacy, self role distance and role ambiguity. No significant difference of means was observed on the remaining dimensions of organizational role stress, in contrast to findings of Nazneen & Bhalla (2013)

It was found that except on the dimension of authenticity all the remaining dimensions has significant difference between the male and female employees of the service sector. Significant difference of means were also found on the dimension of organizational culture and female employees has perceived better and harmonious work culture than their male counterparts.

## RESULTS AND DISCUSSION

The results also states that there does exist a significant negative correlation between the dimensions of organization culture and dimension of organizational role stress. Means if the organizational culture is conducive and harmonious as it is evident from the results the organizational role stress will also not increase and employees will not face any problem related with stress which leads to lot many medical disorders and hence will be productive in the organization.

## CONCLUSIONS

Service industry would never see the setting sun till existence of human race, reason is simple because humans cannot live without food, clothing and shelter and communication or social interactions. The first objective of this study is to examine the level of Organization Role Stress and Organization Culture in service sector. The results indicate that the service employees face moderate extent of organizational role stress, with average score on the dimension of inter role distance, role stagnation, role expectation conflict, role overload, self role distance and overall organizational role stress. High score on dimensions of Role Erosion and Personal Inadequacy and low score on dimensions of role isolation, Role ambiguity and Resource Inadequacy. On the dimension of organizational culture again the score indicates moderate level, with higher extent of score on parameters of Openness, Confrontation, Pro-action, Collaboration and Experimentation whereas average score on parameters of Trust, Authenticity and Autonomy.

Second objective is to examine the relationship between Organizational Culture and Organizational Role Stress. With the help of correlation we tried to find out relationship between organizational culture and organizational role stress. It was observed in the study that the organizational culture and organizational role stress and its components are having negative significant correlations among each other.

Based on the above results it is suggested that service sector should do periodic Stress Audit Survey so that the prevailing stressors can be identified and remedies can be suggested as either organizational interventions or employee interventions. To improve the organizational culture it is the responsibility of the Leadership to work on the missing OCTAPACE factors and must increase autonomy, trust and authenticity by using various OD interventions.

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# POSTER BOOKLET

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# Towards The Red Sea Eco-tourism Future-KSA"

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## ABSTRACT

The Red Sea Project is a part of Crown Prince Muhammad Bin Salman's Vision 2030, will be a luxury resort destination situated across the islands of a lagoon and steeped in nature and culture. It will set new standards for sustainable development and bring about the next generation of luxury travel to put Saudi Arabia on the international Eco-tourism map.



## INTRODUCTION

The Red Sea Project is located along the western coast of the Kingdom of Saudi Arabia, between the cities of Umluj and Al Wajh. Envisioned as an exquisite luxury resort destination built on 50 unspoiled natural islands that stretch along 200 kilometers of stunning coastline, the Red Sea Project will be situated on the site of one of the world's hidden natural treasures.



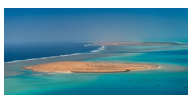
### A KEY PART OF

- A VIBRANT SOCIETY**
  - Strong roots
  - Fulfilling lives
  - Strong foundations
- A THRIVING ECONOMY**
  - Rewarding opportunities
  - Open for business
  - Investing for the long term
  - Leveraging its unique position
- AN AMBITIOUS NATION**
  - Effectively governed
  - Responsibly enabled



## METHODS

- Identify the concepts and principles of Eco-Tourism and sustainability as a concept in KSA
- Study concepts of environmental resorts environmentally compatible and the importance of establish tourist resorts on red sea as a concept for apply vision 2030 projects.
- Identify the concepts of value engineering and the importance of the Economic Study and analysis of the benefits gained compared with the costs required to develop resorts .



## RESULTS

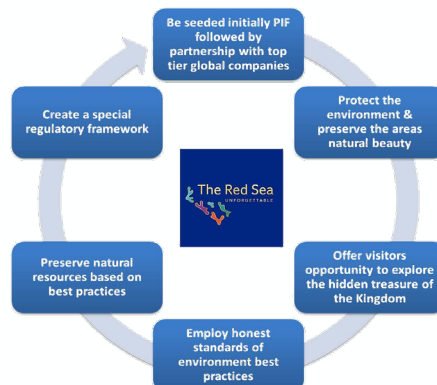
1. The Red Sea Project will be developed with seed capital from the Public Investment Fund(PIF), and partnerships with top-tier international companies will also be formed to ensure new direct investment into the Kingdom that will be redirected back into the country. The project is aligned with the PIF's mandate, which is focused on supporting existing and new projects, both domestic and international, with the potential to strengthen the Kingdom's economy and increase its GDP growth.



Rank	Country	City	Project Name
1	Saudi Arabia	Jeddah	Red Sea Project
2	UAE	Dubai	Emirates
3	Qatar	Doha	Qatar
4	UAE	Abu Dhabi	Abu Dhabi
5	UAE	Ras Al Khaima	Ras Al Khaima

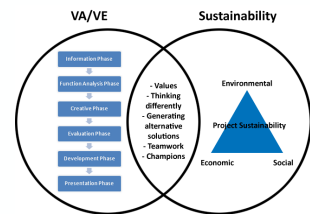
2.Socio-economic Impact With tourism representing the second most important sector in Saudi Arabia, The Red Sea will spearhead the diversification of the Kingdom's leisure industry. As outlined in Vision 2030, the project also aims to diversify the Kingdom's tourism offerings to create a year-round hospitality sector, while promoting cultural conservation and economic stimulation through local and international investments and spending. This is projected to achieve a contribution of SAR 15 billion per annum to the Kingdom's GDP, in addition to creating up to 35,000 jobs, once it is up and running.

### Five treasures make The Red Sea Project special



## SUMMARY

The Red Sea project seems to be a significant initiative to boost and reform the Saudi economy and society, as outstanding results that accomplished after the progressive step to the application of Value Engineering and sustainability in this projects to present useful lessons generated from such short and long term benefits to attract investors .



## CONCLUSIONS

Overall, the success of the Red Sea Project depends on two crucial factors as :

- Crucial factors For Project Success**
  - First, how the global tourism industry responds to the initiative of building luxury resorts in the Red Sea, especially by a conservative country like Saudi Arabia.
  - Second, how would utility and vitality of the project for reducing country's oil dependency. There are chances that young Saudis, who constitute 70 per cent of the total population, can come forward and support the Red Sea diversification initiative of the Crown Prince

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- <http://www.arabnews.com/node/1137781/saudi-arabia> update : 1.3.2018, 15.00PM

# Black Hole Attack in Wireless Mobile Adhoc Network(MANET)

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## ABSTRACT

**Abstract-** Wireless networks are gaining popularity to its peak today as the users want wireless connectivity irrespective of their geographic position. Wireless network is less secure than wired network as there is no physical setup of topology between the nodes. Day by day threads of attacks are also growing substantially in Wireless Mobile Adhoc network (MANET). Our work mainly focuses on analyzing black hole problem on the context of very popular Adhoc on Demand Distance Vector (AODV) protocol by systematically evaluating its performance before & after black hole attack by using various performance metrics. Also we are planning to develop a new mechanism which will detect black hole problem & mitigate its effect on AODV protocol by overcoming limitations of existing mechanism.

## INTRODUCTION

Wu et al. [1] differentiated attacks in MANET into simple and sophisticated attacks based on the simplicity in triggering the attacks. IDS is a device or software application that collects data by monitoring the different system activities, and subsequently analyzes the gathered data to detect possible unauthorized activities, such as malicious activities or security policy violations [4]. MANET has been continuously developed and used in many applications. MANET is more vulnerable compared to wired network due to its mobility feature. Different types of attack may cripple down the network. Black hole attack is one of the severe attack in MANET routing protocols [2, 3]. In Wireless network, before sending the data packets the source establishes the connection to destination through its neighboring nodes by sending route discovery process (RREQ). Malicious node sends fake routing Route Reply (RREP) to source claiming that it has best route to deliver data packets. Ultimately malicious node do not forward data packets to destination, ultimately data packets are simply dropped by malicious node.

## METHODS

Simulation work will be done with NS2 Software: Basically our work has the following objectives.

- To evaluate original performance of AODV by using various Performance metrics such as Throughput, Average end-to-end delay, Packet Delivery Ratio and Packet Loss.
- To evaluate change in performance of AODV under black hole attack.
- To develop mechanism for detection of black hole attack in MANET.
- To develop a mechanism to prevent network from black hole attack.
- To perform overall analysis of results obtained.

## RESULTS

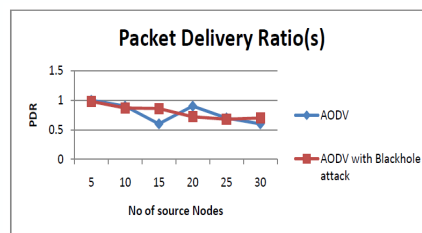
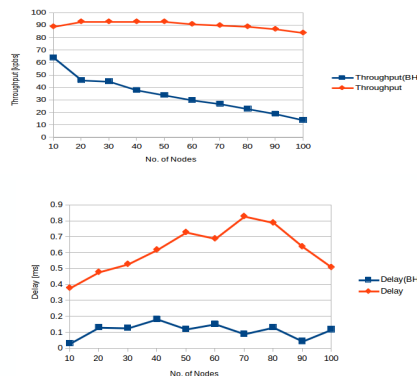


Fig 1 Packet Delivery Ratio of AODV and AODV with blackhole attack

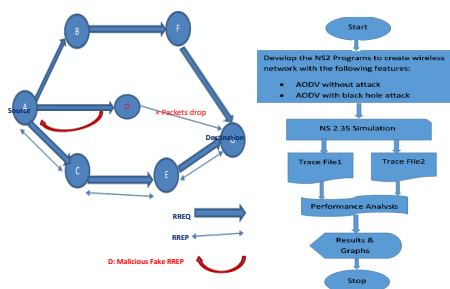


Fig I: Black hole attack in AODV

Fig II: Simulation Work Flow

Fig I: shows how to make the route discovery & fake message generated by malicious node.

Fig II: shows how evaluate the network performance by using NS2 Software.

## SUMMARY

- Wireless networks are less secure than wired networks as the topology of network changes dynamically when mobile nodes move in Ad hoc network.
- Threads of attacks are also growing substantially in MANET.
- Black hole attack is one of the type of attack that could stop forwarding the packets to destination as the malicious node drop the data packets.
- RREQ and RREP is used to discover the route.
- AODV protocol is used to evaluate the performance of black hole attack in MANET.

## CONCLUSIONS

Better to protect "Mobile Ad hoc network" with attacks. AODV routing protocol is subject to a variety of attacks. One of the most dangerous attacks is the black hole attack. Our research proposal evaluate network performance by using NS2 simulation Software. We have created a network with AODV protocol to simulate two case scenarios (without attacks and with black hole attack). We also worked to develop mechanism for detecting and preventing from black hole attack in MANET and measure the performance metrics such as Throughput, Average end-to-end delay, Packet Delivery Ratio and Packet Loss. In future it is possible to use the DSR or DSDV or other protocol and compare it with the use of black hole attacks.

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# JUDISIOUS OPERATION OF DIFFERENT TYPES OF INDUCTION MOTORS FED BY PVPS

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## ABSTRACT

The photovoltaic power system (PVPS), today, has a wide range of applications. One of the most important applications is the operation of electric motors fed by PVPS. In this paper we are going to design a suitable PVPS to supply an induction motor (IM). Different types of PV solar cells have been selected in the design. Moreover, the application has been carried out for five different types of 1-phase and 3-phase IM. The design procedure takes into account the nature of the PVPS output voltage as well as the requirements of the IM at different operating conditions such as starting, loading ratio and normal operation. The energy cost figure (ECF) (the price per produced kWh) has been calculated for such cases taking into consideration the different solar cell types as well as the different IM types. A deep comparative study has been carried out to determine the most suitable and economic solar cell type.

## INTRODUCTION

Photovoltaic power systems have been proven capable of operating efficiently in a wide range of applications including small, low-power devices for remote communications equipment, medium as well as large size systems. For example, the use of PVPS energy for autonomous systems has been shown to be attractive because of its low cost [1]. In isolated region, PVPS pumps are cheaper than standard diesel pumps [2]. This paper provides a contribution of the following field; modelling the PVPS and its characteristics, study of combination of PVPS/Battery Storage (BS/IM) system and at the last investigates the economic analysis of ECF.

## METHODS

The methodology can be divided into four parts as illustrated:-

### PART 1:- Design of PVPS:

The design of PVPS includes the calculations of the required solar cells area, no of modules to satisfy the requirements of the load power, voltage and current.

### PART 2:- Energy Balance:

The task of energy balance is defined in the system under study as follows:

The total energy generated by the designed solar cell array, ESA, must be exactly equal to the energy required by the load requirement of the energy, ELL, plus the energy required to recharge the battery, EB, i.e.

$$ESA = ELL + EB$$

### PART 3:- I-V Characteristics (C/C)

By the aid of radiation, ambient temperature data during the day time along the year and the above equations (24), (25) and (26). The I-V C/C of the solar cells can be carried out as detailed in the following [5]:

$$V = f(I)$$

$$V = -I * R_s + \left(\frac{1}{\lambda}\right) * \ln \left( \frac{I_{ph} - BI - (V/R_{sh}) + 1}{I_o} \right)$$

### PART 4:- Cost Estimation:

This item introduces the cost estimation procedure that has been followed to calculate the ECF for the different studied cases. The cost of solar cell modules, battery storage (BS), power conditioning unit (PCU), land area, the wiring and control equipment have been considered [6].

## RESULTS

The ECF in Cent/kWh generated by PVPS has been estimated under the following cases:

Five selected IM, Three selected solar cell types, Four starting conditions.

During the computation of ECF under the above cases, it is noticed that there are two factors which affect it. These factors are the BS rating and the yearly generated energy. The obtained results are tabulated in Tables (6), (6), (7) and (8). From these Tables it is concluded that:

Monolithic- thin film Amorphous PVPS is the most economic one to feed CRIM (1-phase), WRIM (3-phase) and SQIM (3-phase) under worst condition. This is also true under normal condition except for SQIM. Also this PVPS type has the same advantages to supply CRIM under the other two conditions.

Dendritic-web silicon PVPS is the most suitable type from the economical point of view to supply SPIM (1-phase) and CSIM (1-phase) under all starting conditions. This is also true for the studied SQIM (3-phase).

PVPS type represents the most economical type to feed studied WRIM (3-phase) under no load (50% of rated voltage) and worst conditions. Considering the I-V C/C which was studied in section (4.3.2), it is recommended to use Monolithic-thin film amorphous PVPS instead of Dendritic-web silicon PVPS. This is because of its suitable technical parameters. Moreover, from Tables (5), (6), (7) and (8), it is seen that the ECF of PVPS using Monolithic-thin film-Amorphous solar cell has a value which is approximately corresponding to its value of PVPS using Dendritic-web silicon.

It is not recommended to use M-50 PVPS because of its high ECF and its I-V C/C has a poor technical parameter.

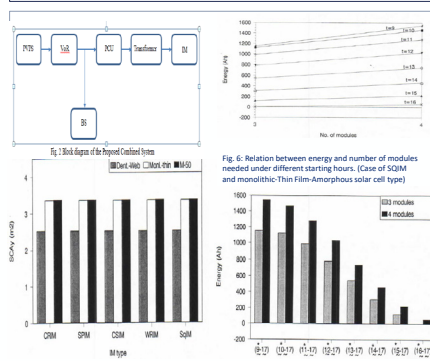


Fig. 3: The of Solar Cell Types on the SCAY Needed Under Different Types of IM.

Fig. 5: effect of starting hour on the surplus and deficit energy (using monolithic-Thin Film-Amorphous solar cell type)

## SUMMARY

Case of operation	Starting under full load (Worst Condition)														
Motor type	CRIM			SPIM			CSIM			WRIM			SQIM		
Cell type	DW	MT	MSO	DW	MT	MSO	DW	MT	MSO	DW	MT	MSO	DW	MT	MSO
No of mod.	4	5	13	7	8	22	7	8	22	3	4	10	3	3	9
ECF (¢/kWh)	2.87	2.76	3.18	1.64	1.72	1.89	1.64	1.72	1.89	3.83	3.44	4.13	3.8	3.5	4.5

Case of operation	Starting under full load (Worst Condition)														
Motor type	CRIM			SPIM			CSIM			WRIM			SQIM		
Cell type	DW	MT	MSO	DW	MT	MSO	DW	MT	MSO	DW	MT	MSO	DW	MT	MSO
No of mod.	4	5	13	7	8	22	7	8	22	3	4	10	3	3	9
ECF (¢/kWh)	2.87	2.76	3.20	1.67	1.72	1.89	1.64	1.72	1.89	3.82	3.4	4.1	3.8	3.5	4.6

## CONCLUSIONS

The following conclusions can be obtained:-

The studied IM can be started at any hour from 9 to 15 without deficit energy by using three modules only. On the other hand, four modules must be used to start the studied IM at hour 16 without deficit.

The PVPS voltage, current and power at the maximum power point have suitable values for running studied single-phase and three-phase IM directly at certain hours or by using a conventional tapping transformer through a suitable PCU.

The I-V C/Cs of monolithic thin film amorphous solar cell type has the most suitable technical parameters to be used in constructing PVPS to supply studied IM and this type is the most economic one to feed studied CRIM (1-phase), studied WRIM (3-phase) and studied SQIM (3-phase) under worst condition. This is also true under normal condition except for studied SQIM. Also this PVPS type has the same advantages to supply studied CRIM under the other two conditions.

Dendritic-web silicon PVPS is the most suitable system from the economical point of view to supply the studied SPIM (1-phase) and studied CSIM (1-phase) under all starting conditions. This is also true for studied SQIM (3-phase) under normal and no load conditions. This PVPS type represents the most economic system to feed the studied WRIM (3-phase) under normal (50% of rated voltage) and worst case conditions.

It is not recommended to use M-50 PVPS because of its high ECF and poor technical parameters.

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# Quality Cost in Saudi Arabia Plastic and Glass Industry

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## ABSTRACT

Quality costs are those resulting from producing, identifying, repairing, and avoiding defective products. Quality costs consist of the following four categories Internal costs, failure costs, external failure costs, and appraisal costs. A survey of several plastic and glass industries in Saudi Arabia is conducted. The survey includes a cross representation of manufacturing activities existing in the region. The survey is intended to assess the level of awareness and quantitative estimates of quality costs as related to the plastic and glass industries. The survey design and findings are presented along with analysis. Specific conclusions are drawn regarding quality costs studies and reduction/improvements programs as related to the surveyed industry category.

## INTRODUCTION

Quality costs are those resulting from producing, identifying, repairing, and avoiding defective products. The following four categories are used to define and quantify manufacturing quality costs. A survey of plastic and glass industries in Saudi Arabia is conducted. The survey includes a cross representation of manufacturing activities existing in the region. The survey is intended to assess the level of awareness and quantitative estimates of quality costs as related to the above four categories. The survey design and findings are presented along with analysis. Specific conclusions are drawn regarding quality costs studies and reduction/improvements programs as related to the surveyed industry categories.

## METHODS

In this research, a survey study was conducted to measure the cost of poor quality in Saudi Arabia plastics and glass industry. This study targeted 48 affiliations, where 19 affiliations responded, five of them were excluded due to incomplete/erroneous responses.

## RESULTS

This study is to assess the status of poor quality in Saudi plastic and glass industries. In order to achieve this goal, a questionnaire was designed and conducted online to related people. Data of this questionnaire covered the following aspects:

### 3.1 Internal Cost

Costs refer to these costs incurred prior to the product delivery to the customer. They include costs resulting from scrap, rework, retest, downtime, yield losses or disposition.

### 3.2 External Failure

Costs refer to these costs occurring after the products are delivered to the customer. They include categories such as complaint adjustment, returned products, warranty charges, and liability or allowances concessions.

### 3.3 Appraisal Cost

Appraisal costs are those resulting from measuring, evaluating, and auditing of material and products to determine their condition and conformance to specifications. They include costs of inspection and testing of incoming material and through production, associated material and services consumed, and instruments and testing equipment calibration.

### 3.4 Preventive Costs

Preventive costs are those associated with activities aimed at reducing appraisal and failure costs. They include costs of quality planning and design, new products review, process control, training, quality data acquisition, analysis and reporting, and improvement projects. Cost of poor quality is measured as the sum of all costs such as inspection cost, training cost, cost of scrap, cost of rework, and cost of return. Results show that the annual average cost of poor quality is 7.0145%.

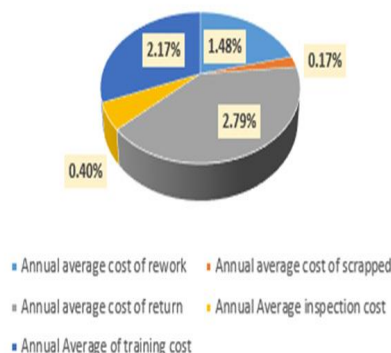
## CONCLUSIONS

Through the previous discussion of the questionnaire, plastic and glass industry faces real problem related to the cost of poor quality. This study has found that the annual average cost of rework is 1.48%, annual average cost of scrapped is 0.17, annual average cost of return has the highest percentage of 2.79%, annual average of inspection cost is 0.4%, and the annual average of training cost is 2.17%. These costs resulted be the lack of quality knowledge aspects in this industry. Technicians have to get more training on how to reduce waste and increase productivity. These companies showed keep periodic maintenance tables and machine breakdown records.

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Cost of Poor Quality in Saudi Arabia plastics and glass Industry



# Organizational Culture: A case study Measuring the Importance and Presence of Organization Values at a Higher Education Organization in Saudi Arabia

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## ABSTRACT

This paper presents the findings of a study that was conducted to investigate the levels of organizational culture values that are present in students and instructors in a higher education organization in Saudi Arabia. A Survey was prepared and conducted to obtain primary data from students and instructors perception of thirty two basic and common values that are relevant to the study of organizational culture. The study findings gives valuable insights into how students and instructors see the importance and presence of organizational values and beliefs in the organization. Moreover, the enthusiasm of instructors and students gave a clear indication of how significantly important the surveys were to them. Higher education organizations may look at this paper's findings and may choose to apply its methodology to their organization and utilize its outcomes to better understand and then improve their organizational culture. Finally, this study provide a thorough investigating of a higher education organization culture by ranking the thirty two common values and measures their presence in the students and instructors community. The study will hopefully open an area of interest that could provide considerable insight for researchers interested in this topic.

## INTRODUCTION

Higher education institutes and organizations are considered key stone and corner base of any society since they provide the higher education needed for all classes of people in a country. The majority of the workforce in any facilities, institutions, companies, or government organizations have workers whom they graduated from a college or at least had some sort of a higher education experience.

Workers who does not have a post-secondary education are usually have far less job options than if they earned a college degree. They are typically work in the services, manufacturing, or construction jobs that does not requires high educational and analytical capabilities.

College education traditionally equip students with many skills in various subject areas which enables them to make better choices in their personal and professional life. In addition it provide them with the tools necessary for improving their personal and social skills for self-discipline and effective interaction with others which will help them to achieve career advancement.

It is only logical to say that improving higher education organizations will benefit not only society but the whole world at large. It is an important subject that never stops to continue developing. It is in this context that this study is conducted to measure the importance and presence of organizational values in a higher education organization (1).

The organizational culture can be defined as the set of values, beliefs, and attitudes that are shared by the constituents of a given organization. Its importance stems from its influence on organizational performance as it derives the organizational members actions and subsequently its outcomes. Therefore, studying and understanding organizational culture enables the organization leaders to effectively manage and improves their organization performance (5).

Understanding the culture of an organization is a major key for effective management practices in universities. Organizational culture can further be defined as a system of shared meanings, beliefs, and values held by organizational members that determines how they act toward each other and outsiders. In other word, organizational culture can be considered as a pattern way of thinking, feeling, and reacting that exists in an organization. Organizational culture is descriptive; it is concerned with how members perceive the organization, not with whether they like it. It describes rather than evaluate. It is a crucial element in every organization to study their current culture and determine how it influences its members. In order to improve current values and beliefs not to mention introducing new values that will influence student positively and provides them with good academic behaviors (4).

## METHODS

According to previous studies on organizational culture, and literature search on the topic, thirty two values and beliefs that are crucial in most organizations were selected. It was believed that the listed values are the most common in higher education organizations. Subsequently, the survey structure was based on measuring three aspects of each value. First, its relevant importance the organization. Second, its existence in the members of the organization. And finally, its existence in the evaluator themselves. Each aspect is evaluated on a scale from 1 to 5 where 1 represent the least presence and 5 the most.

The study of the organizational culture include a sample of a total of 130 participants including 95 students and 35 instructors.

### Organizational Culture Survey:

The purpose of the survey was to measure the importance and presence of organizational ethics and values in the educational organization.

In the survey, thirty two of the most important and common values and beliefs that exist in organizations are selected. The participants are asked to evaluate their importance and presence using a scale of (1 – 5), where 5 represent the highest ranking and 1 is the lowest. There thirty two values are:

**Truthfulness, Honesty, Devotion, Commitment - Respect for Time, Creativity, Stereotype - Impression, Affiliation, Cooperation/Teamwork, Competition, Confidence, Taking Initiatives, Clean Appearance, Responsibility, Self-censorship, Freedom of Expression, Forgiveness, Planning, Achievement - Time Management, Seriousness, Justice, Positivity, Privacy, Firmness and rigor, Directing, Sacrifice - Altruism, Harmony, Communication, Enthusiasm, Interest, and Carefulness.**

## RESULTS

It was found from the survey that was handed to instructors that the five most important values are shown in the following tables.

Table 3. The five most important values:

Truthfulness	Honesty	commitment	Respect	Devotion
4.9143	4.9143	4.8286	4.8235	4.8

As seen in table 3 the most important values to the instructors are Truthfulness and Honesty with both scoring 4.9143. This indicates how vital these two values are that they both had the same importance. It is clear from the table that the values instructors perceive most important are the same values organizations are more likely to implement.

Table 4. The five least important values:

Sacrifice	Enthusiasm	Firmness	Harmony	Stereotype
4.0857	4.0	3.9714	3.8571	3.7353

As seen from table 4, even though these are the five least important values its score still high and above 3.5; this shows how committed the instructors are about these values.

## CONCLUSIONS

The study results and analysis shows that both instructors and students see these values with significant importance since the average scores for all listed values were above 3.7. On the other hand, presence in others measures scores were about 2.7. A reason for this drop in score is that some of these values might not be visible from the evaluator point of view. That's why another part was added to measure these values presence in individuals, where the lowest scores was 3.39 which is higher than the 2.7 score in Presence in others part.

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Figures 5, & 6: The Relationship between importance, presence in others, and presence in individual for Instructors and Students:



# COMPARING VARIOUS MIDDLE MACHINES WITH TIME SYNCHORNIZATION USING VIDEO STREAMING PROTOCOLS

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## ABSTRACT

*approaches have been proposed to stream protocol with time synchronization, best-effort networks. In this research work, we propose a distributed multimedia streaming and simulated ADHOC network environment. The main of the research is to reduce traffic via network.*

Index Terms:

Distributed streaming, RTT Timing Calculation, Forward Error Correction

## Literature Review

Use of wireless links renders an Ad hoc network susceptible to link attacks ranging from passive eavesdropping to active impersonation, message replay and message distortion. Eavesdropping might give an attacker access to secret information thus violating confidentiality. Active attacks could range from deleting messages, injecting erroneous messages, impersonate a node etc. thus violating availability, integrity, authentication and non-repudiation. Nodes roaming freely in a hostile environment with relatively poor physical protection have non-negligible probability of being compromised. Hence, we need to consider malicious attacks not only from outside but also from within the network from compromised nodes. For high survivability Ad hoc networks should have a distributed architecture with no central entities, centrality increases vulnerability. Ad-hoc network is dynamic due to frequent changes in topology. Even the trust relationships among individual nodes also changes, especially when some nodes are found to be compromised. Security mechanism need to be on the fly (dynamic) and not static and should be scalable, Hundreds of thousand of nodes.

## SUMMARY

The time synchronization using reference unicasts is a distributed video streaming framework using a receiver-driver protocol for simultaneous video streaming from multiple senders to a single receiver in order to achieve higher throughput. The method employs the following algorithms:RAA (Rate Allocation Algorithm) ,PPA (Packet Partition Algorithm), Packet Loss detection, Packet Recovery Algorithm.

## INTRODUCTION

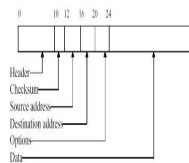
Applications such as audio and video conferencing and the transmission of live or recorded events using audio and video are only two of the many applications that blend multimedia and networks. Networks are designed to reliably transmit data such as files from point to point. Multimedia places further demands on the network. First, data such as audio cannot tolerate delays in delivery. A network whose basic task is to move files from one place to another can transmit data packets at an uneven rate. If portions of a file arrive slowly or out of order, then it is not a problem. Multimedia requires that data packets arrive at the client on time and in the proper order. Real-time protocols and quality-of-service guarantees on the network address this issue.

## CONCLUSIONS

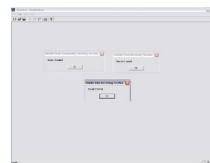
The video stream protocol based network manages the traffic to get the efficient data passing path because of it's time synchronization. The other unsynchronized network does not have time synchronization so that it can't handle the traffic management in network. In overall concept the video stream protocol based synchronized network is the best one in the views of Time Consumption, Traffic Management, Band width estimation and Packet loss detection and Packet loss reduction.

## METHODS

In the existing method the ad-hoc network cannot be synchronized so that there is a chance for having more 'Sending Time' and having 'heavy packet loss problem'. If the network is more traffic then this system can't manage it. The final integrated multimedia file may be a corrupted one. In this proposed method we extend our previous work by proposing a novel rate allocation scheme to be used with FEC to minimize the probability of packet loss in bursty loss environments. In general, FEC has been shown to be an effective tool in combating packet loss in streaming applications on the packet switched networks. The main drawback of FEC though is that it results in bandwidth expansion and hence reduces the amount of available bandwidth for the actual video bit stream. In this work, we show that by combining path diversification and FEC, we can combat bursty loss behavior in the Internet more effectively.



Structure of IP packets



Video streaming protocol Middle machine 3

The tools can be updated to various mobile applications. So that the denial of service can be avoided easily. Also the packet security is also not provided in the systems. So the security can be provided as another application. Now we are controlling for many server with single client. It can be enhanced for multiple server and multiple clients.

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# Third generation Solar cell Multilayer

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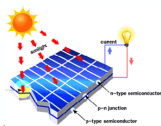
## ABSTRACT

In the domain of photovoltaics, this project identifies optical light confinement as a key point to increase module efficiency. Objective of the project is to push the implementation of optical layers as part of adapted thin film silicon solar cells into large scale production facilities.

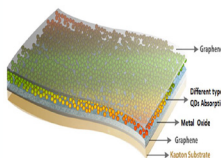
## INTRODUCTION

Global warming Increase demand of sustainable energy sources one of them is Free and worldwide availability which is the SUN.

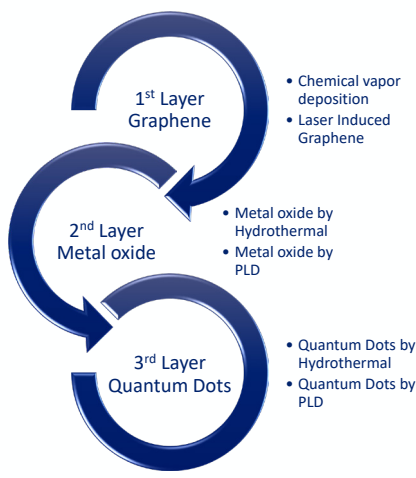
**Photovoltaic source** :Conversion of solar energy into directly usable electrical energy [1]



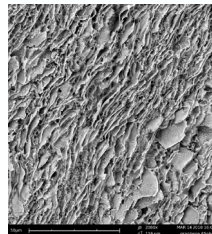
Our design contain of Multilayer with different Material depending on Energetic Alignment and their light absorption capability



## METHODS

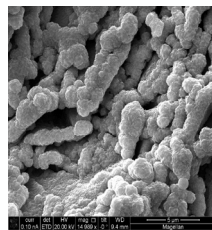


## RESULTS



**1st Layer Graphene**

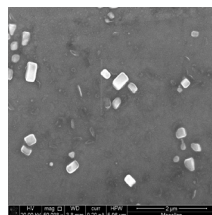
- Thickness of substrate:
- thickness used were 5mm Resistivity of the result LIG: The result LIG had 0.6 - 0.7 Ohm/m



**2nd Layer Metal oxide**

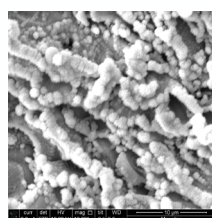
Property	Value
Lattice parameters	a = b = 0.35 Å c = 0.21 Å
Density	5.00 g/cm <sup>3</sup>
Melting point	2740 K
Stable crystal structure	Wurtzite
Dielectric constant	8.00
Refractive index	2.008
Band gap (eV)	3.32 eV (direct)
Exciton binding energy	40 meV
Electron/Hole effective mass	0.24 m <sub>e</sub> / 0.59 m <sub>e</sub>
Hole mobility (cm <sup>2</sup> /Vs)	5-50 cm <sup>2</sup> /Vs
Electron mobility (cm <sup>2</sup> /Vs)	100-200 cm <sup>2</sup> /Vs

Key properties of bulk wurtzite ZnO

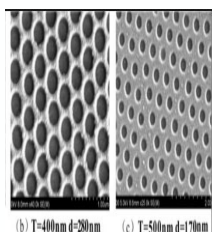


**3rd Layer Quantum Dots**

Zero dimensional nanostructures have gained interest due to their unique properties especially tuning their bandgap based on their size and shape.



The result of the multilayer fabrication as Shown it contain the three layers mention above



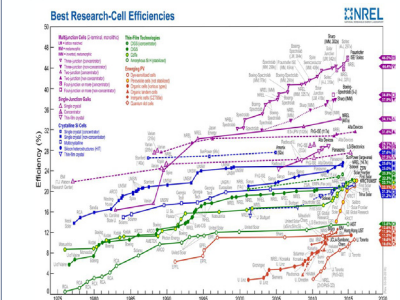
Metallic Nano-holes arrays is attractive for better higher electron transmission as electrode and in the same time good photon transparent to the active layers [4]

## SUMMARY

As shown in the result the research is in its final stage few characterization and modifications will be needed for last optimization of efficiency.

## CONCLUSIONS

Other teams reach 11-12% efficiency for similar approach [5]



Looking for higher and cheaper result

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# Electrophotonic Improvement of Polymer Solar Cells Using Graphene and Plasmonic Nanoparticles

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## ABSTRACT

In this paper, an efficient light trapping polymer solar cell using plasmonic nanoparticles and antireflection transparent graphene layer is introduced. The shape of the periodic nanostructure of nano-crystalline zinc oxide grown on its flat surface, and the thickness of graphene layer are optimized. In addition, electrical and optical models are developed to calculate the short circuit current density, fill factor and overall efficiency of the designed polymer solar cell structure. The distributed gold nanoparticles (Au-NPs) inside the active layer with 33 Au-NPs per unit cell produced the maximum efficiency and short circuit current density, 8.93% and 17.32 mA/cm<sup>2</sup> respectively, and gives a very high light absorption near-infrared region. Finally, energy band diagram for all used materials and electric field distribution inside the solar cell structure are also illustrated in this work.

## INTRODUCTION

Organic photovoltaic devices (OPVs) have drawn much research interest in the past decades due to their low cost, flexibility, lightweight, large area and its roll-to-roll (R2R) production compatibility [1-3]. On the other hand, the lower efficiency and stability are still massive challenges [2]. As a result, many techniques have been introduced to enhance the power conversion efficiency (PCE) by optimizing the device structure [3] and using a plasmonic cavity [2]. Surface plasmon localization on metallic nanoparticles is considered as one of the efficient technique used to enhance the optical absorption of solar cells [3].

## Literature Review

Di Qu and et al. enhanced the optical absorption by distributing (Ag-NPs) uniformly at the interface between (PEDOT:PSS) and (P3HT:PCBM) [4]. The optical absorption enhancement reached to almost 100% when the Ag-NPs were located in the interface layer. Organic solar cell with a thick active layer with 11% power conversion efficiency is obtained theoretically by Nicla [5]. Overall efficiency of a polymer solar cell has been improved by using nanoholes photoactive layer to almost 6.7% [4]. The authors compared their model to Tumbleston model [6], where a photonic crystal photoactive layer was used to reach 5.03% efficiency enhancement. Graphene is a monolayer of carbon atoms packed in two-dimensional single-atom-thick, which attracted attention in many research areas specially solar cells [7]. Graphene can be used as a highly transparent antireflection coating instead of (ITO) not only for the remarkable optical, electrical, mechanical and thermal properties but also for the corrosion of ITO due to the chemical interaction with PEDOT:PSS.

## METHODS

In this paper, a polymer solar cell light harvesting has been improved specially at near infrared region which accounts for almost 40% of the sunlight energy. Short circuit current density ( $J_{sc}$ ) and light absorption in P3HT:PCBM active layer are simulated by applying a finite difference time domain (FDTD) method using Lumerical FDTD solutions software package. Optimization of a periodic nanostructure shape grown on a nc-ZnO layer and the radius of Au nanoparticles (NPs) distributed inside the active layer are introduced in this work. Different thicknesses and surface shapes of a graphene layer are also studied. Furthermore, the optical absorption has been enhanced by distributing Au-NPs, with different densities, inside the active layer of the proposed solar cell structure. The fill factor can be calculated using Equation (1).

$$FF = \frac{\frac{qV_{oc}}{kT} - \ln\left(\frac{qV_{oc}}{kT} + 0.72\right)}{\frac{qV_{oc}}{kT} + 1} \quad (1)$$

where  $k$  is the Boltzmann constant and  $T$  is the absolute temperature. The fill factor can also be calculated from Equation (2) as a function of maximum output power  $P_{max}$

$$FF = \frac{P_{max}}{J_{sc}V_{oc}} \quad (2)$$

By calculating the maximum output power,  $P_{max}$  the overall solar cell efficiency,  $\eta$ , can be calculated as a ratio of maximum output power to solar input power.





Graphene surface roughness	$J_{sc}$ (mA/cm <sup>2</sup> )	Efficiency (%)
	16.12	8.31
	16.47	8.49
	16.69	8.60
	16.74	8.63

Table 1. Different graphene surfaces shapes versus short circuit current density and overall efficiency.

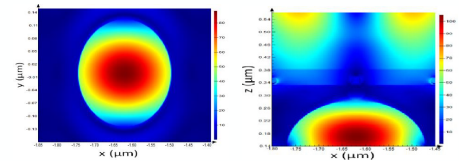


Fig 5. Electric field distribution at x-y and x-z plans.

## CONCLUSIONS

A major enhancement of the electrical and optical properties in the active layer has been achieved by using graphene layer, 200 nm thicknesses, instead of ITO layer. A hemispherical nc-ZnO nanostructure grown inside the active layer produced maximum optical and electrical properties among different simulated shapes. Moreover, Au-NPs, 30 nm radius, are randomly distributed inside the active layer with different concentration. The maximum obtained overall efficiency and short circuit current density are 8.93% and 17.32 mA/cm<sup>2</sup> respectively when the plasmonic density is 33 Au-NPs/unit cell. In addition, electric field distribution shows that the inverted hemispherical shape in the graphene layer behaves as a nanoantenna by retransmitting the tapped light from the surface into the polymer solar cell structure. Hence, the light is transferred from the Au-NPs distributed in the active layer to nc-ZnO nanostructure and then to the Au electrode layer.

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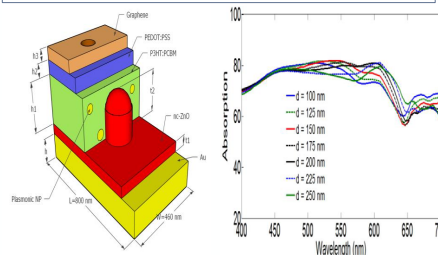


Fig 1. Schematic diagram of the proposed structure

Fig 2. Absorbed light of different graphene thicknesses.

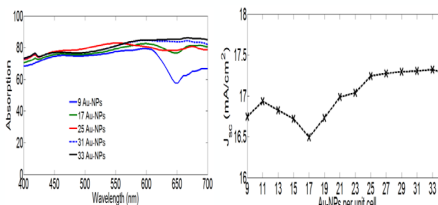


Fig 3. Absorption of different Au-NPs inside the active layer.

Fig 4. Short circuit current density vs the total number of Au-NPs/unit cell.



# Enhancing the microstructure and tensile creep resistance of Sn-3.0Ag-0.5Cu solder alloy by reinforcing nano-sized ZnO particles

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## Literature Review

In previous literature studies, Zhao et al. observed that reinforcing (0.25, 0.5 and 1.0wt%) nano-Al<sub>2</sub>O<sub>3</sub> in Sn-3Ag-0.5Cu (SAC305) mainly enhanced the reliability of the micro solder joints, but did not modify the strength of as-soldered joints obviously [10]. Also, Xing et al. reported that 1 wt% Al<sub>2</sub>O<sub>3</sub> addition in Sn-92Zn solder improved wettability, mechanical properties and hardness of the composite solder as a result of the changes of the interfaces and the microstructure [11]. Nasir et al. demonstrated that distribution of TiO<sub>2</sub> into lower silver content SAC composite increased the hardness of the composite solders compared with monolithic SAC solder alloy [12]. On the other hand, adding 0.1 wt% nano-TiO<sub>2</sub> to SAC305 solder exhibited the smallest growth rate for both Cu<sub>3</sub>Sn and Cu<sub>6</sub>Sn<sub>5</sub> IMC layers and gave the most prominent effect on suppressing IMC growth [13]. Also, Wu et al. [14] evaluated that addition 0.5wt% TiO<sub>2</sub>NPs into Sn-0.3Ag-0.7Cu (SAC0307) solder affected the IMC growth through isothermal aging and mentioned that the growth of the IMC layer is a diffusion-controlled process. Sun et al. showed that addition of (0.05, 0.1, 0.2, 0.3 and 0.4 wt%) Al-NPs to Sn-1.0Ag-0.5Cu (SAC105) solder decreased the wettability and mechanical features of the solder [15]. However, the appropriate doping of TiC NPs to the SAC305 solder matrix could lead to an improvement in both shear strength and microhardness of the composite solders [16].

Most of the works focus on the interfacial morphology and growth of IMC layers at the interface of solder joints. However, the effect of ZnO NPs on the creep properties of SAC305 composite solder hasn't been found in the literature. It is no doubt that creep deformation is considered as the most important micromechanical inelastic deformation mechanism in soldered joints.

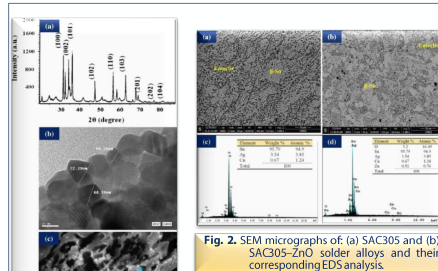


Fig. 2. SEM micrographs of: (a) SAC305 and (b) SAC305-ZnO solder alloys and their corresponding EDS analysis.

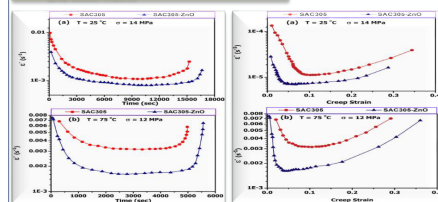


Fig. 3. Comparison creep time-creep rate curves at (a) T = 25 °C and σ = 14 MPa and (b) T = 75 °C and σ = 12 MPa for SAC305 and SAC305-ZnO solder alloys.

Sn-Ag-Cu lead-free solders are regarded as a potential substitute for Pb-Sn solder alloys. In the current study, the non-reacting, non-coarsening ZnO nano-particles (ZnO NPs) were successfully incorporated into Sn-3.0Ag-0.5Cu (SAC305) lead-free solder by mechanical mixing of ZnO powders and melting at 900 °C for 2 h. Tensile creep testing was performed for plain SAC305 solder and SAC305-0.7wt% ZnO NPs composite solders and a Garofalo hyperbolic sine power-law relationship was created from the experimental data to predict the creep mechanism as a function of tensile stress and temperature. The creep resistance of SAC305 solder alloy was improved considerably with ZnO NPs addition, although the creep lifetime was increased. From microstructure observation, reinforcing ZnO NPs into SAC305 solder substantially suppressed the enlargement of Ag<sub>3</sub>Sn and Cu<sub>6</sub>Sn<sub>5</sub> intermetallic compound (IMC) particles and decreased the spacing of the inter-particles between them, reduced the grain size of β-Sn and increased the eutectic area in the alloy matrix. The modification of microstructure, which led to a strong adsorption effect and high surface-free energy of ZnO NPs, could result in hindering the dislocation slipping, and thus provides standard dispersion strengthening mechanism.

Recently, as micro-/nano-systems technologies are progressive, the size of electrical components is diminishing resulting in an increase in the number of input/output terminals [1]. As a consequence, the numbers of solder joints per package have increased and the dimensions of the solder joints have decreased. Therefore, conventional solder technology can no longer guarantee the solder joint reliability of solder components attributable to the softening nature and the high diffusivity of solder. Thus, for the solder joints with reduced dimension to stay functional, powerful, and reliable, the developing of newly second generation of Sn-Ag-Cu solders is desperately demanded. To get solder joints with higher microstructure stability and better mechanical properties of the conventional solder, a potentially viable and economically affordable innovative approach are to incorporate appropriate second phase particles of the alloy matrix such as TiO<sub>2</sub> [2–6], SrTiO<sub>3</sub> [7], ZnO [8], and Al<sub>2</sub>O<sub>3</sub> [9]. Hence, nanoparticles (NPs) have gained increasing attention recently owing to the large surface to volume fraction and quantum size effect. Therefore, nano-composite alloys are regarded as the most hopeful to substitute the present lead-free solder.

For the preparation of the Sn-3.0 wt% Ag-0.5 wt% Cu (SAC305) alloy, ingots of Sn, Ag, Cu with high purity 99.99% were melted in a vacuum arc furnace under high purity argon atmosphere to produce rod-like specimen with a diameter of approximately 10 mm. The melt was held at 900 °C for 2 h to complete the dissolution of Sn, Ag, and Cu. Then, the alloy was remelted three times in order to get a homogeneous composition. The nanocomposite solder Sn-3.0 wt% Ag-0.5 wt% Cu-0.7 wt% ZnO (SAC305-ZnO) was prepared by mechanically dispersing 0.7 wt% of ZnO nanopowder into the molten SAC305 solder and remelting in a vacuum furnace for 40 min with electromagnetic stirrer to ensure a homogeneous distribution of the reinforcing particles, then cast in a steel mold. The solder ingots were then mechanically machined in wire samples of a gauge length marked 4 × 10–2 m and 1.2 × 10–3 m in diameter. Before tensile creep tests, all specimens were heat-treated at 130 °C for 30 min to stabilize microstructure and remove residual stress and defects produced during the specimen preparation.

## 1. Characterization of ZnO-NPs

The XRD patterns of the ZnO-NPs are illustrated in Fig. 1a. A definite line broadening of the XRD peaks indicates that the prepared material consist of nanoparticles. Fig. 1b represents a TEM image of the nano-metric ZnO particles used in this study. It is observed that ZnO NPs are uniformly distributed and the particle size of nominally nano-sized ZnO particles is around 50–100 nm [15]. As shown in Fig. 1c, it is clear that the ZnO nano-particles are dispersed uniformly on the surface of the solder matrix as a fine dot-shaped precipitate.

## 2. Microstructure analysis

It is observed that reinforcing ZnO NPs decreased the spacing of the inter-particles between IMCs, reduced the grain size of β-Sn, and increased the eutectic area in the alloy matrix, as shown in Fig. 2.

## 3. Creep Properties

Creep tests revealed that the addition of 0.7 wt% ZnO NPs decreased the steady-state creep rate while the creep lifetime of the plain SAC305 solder increased, as exhibited in Fig. 3.

- (1) The ZnO NPs have been successfully reinforced in the Sn-3.0wt% Ag-0.5 wt% Cu alloy by mechanically blending and melting.
- (2) The morphology of the microstructure of the SAC305 solder alloy changed after ZnO NPs addition. Microstructural investigations revealed that the addition of nanosized 0.7 wt% ZnO particles to SAC305 solder inhibited the growth of the grain size as well as the IMCs due to the adsorption of ZnO NPs in the matrix during solidification.
- (3) Creep tests revealed that the addition of 0.7 wt% ZnO NPs decreased the steady-state creep rate while the creep lifetime of the plain SAC305 solder increased.

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# The Application of Design of Experiments to Improve the Quality of High Density Polyethylene Pipes

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## ABSTRACT

Extrusion is one of the fundamental shaping processes of metal and ceramics as well as polymers. One important extruded plastic material is High-density polyethylene pipe (HDPE) which can be used to carry water, wastewater, slurries, chemicals, hazardous wastes, and compressed gases safely.

In the extrusion process of Polyethylene Pipes one critical issue is the pipe thickness, pipes that are too thin will fail, and are considered of low quality. On the other hand, extra thick pipes are considered a waste of raw material and processing time that the customer is not going to pay for.

## INTRODUCTION

Polyethylene is strong, extremely tough and very durable. Whether you're looking for long service, trouble-free installation, flexibility, resistance to chemicals or a myriad of other features, lightweight and a cost effective replacement for metal pipes, high-density polyethylene pipe will meet all daily life requirements.[Osswald et al 2002]

The purpose of this work is to determine the factors that affect the wall thickness in polyethylene pipe products. This work aims at using a case study approach to show how Design of Experiments (DOE) can be used in order to improve the quality of polyethylene Pipe products.

## METHODS

To find the factors that would yield the best wall thickness an Experimental Design approach would be adopted, similar to [Kirk 1995, Ingel & Roe, 2011]

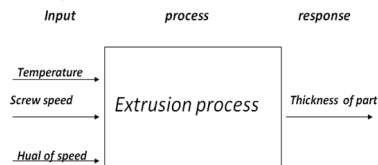


Figure 1: the Process Parameters

Three factors were identified after careful analysis of the process and interviews with the engineers responsible for the process. A 6 replicates Full Factorial Design was adopted and the 48 measurements were sampled randomly. The data was analyzed using StatGraphics Software package. [Omar et al 2013]

## Results

Analyzing the data using StatGraphics gives us the following ANOVA Table 1, showing the effect of each factor and their interactions:

Table 1

Table 1: ANOVA for selected factorial model					
Analysis of variance table [Partial sum of squares - Type III]					
Source	Sum of Squares	df	Mean Square	F-Value	p-value Prob > F
Model	1.75	5	0.3500	8.3100	< 0.0001
A-Temp	0.00	1	0.0030	0.0720	0.7892
B-Haul off Speed	0.4	1	0.4000	9.5200	0.0036
C-Screw Speed	1.25E-04	1	0.0001	0.0030	0.9568
AC	0.72	1	0.7200	17.1800	0.0002
BC	0.62	1	0.6200	14.7900	0.0004
Residual	1.77	42	0.042		
Lack of Fit	0.33	2	0.16	4.5	0.0172
Pure Error	1.44	40	0.036		
Total	3.52	47			

The results show that the model is significant at  $\alpha = 0.01$ . In particular factors B Haul-off speed and the interaction of this factor with the other two factors have an impact on the thickness of the pipe wall.

Careful analysis of the residuals show that the model is valid and the assumptions for ANOVA hold. As seen in Figures 2 and 3

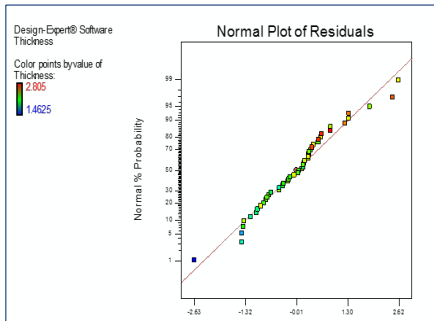


Figure 2: Normal Plot of Residuals

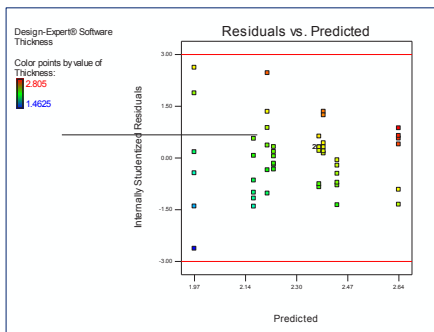


Figure 3: Residuals vs. predicted values

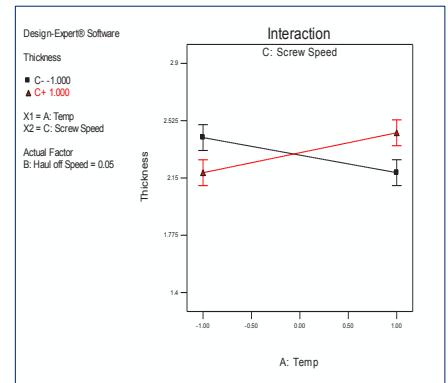


Figure 4: Interaction Plot between Factors A and C

## CONCLUSIONS

The work utilized Design of Experiment to determine which parameters could be influencing the process in order to optimize it.

The analysis showed that not all factors examined were significant, however all interactions with Factor B were significant, as seen in Figure 4.

This approach is easy to apply specially with using the proper statistical package like StatGraphics or Minitab.

Future work extensions include optimizing the process to a specific design requirements. This could be achieved using Response Surface Methodology. This work could be the seed for implementing 6 Sigma for the process and reduce its defects and increase the yield.

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# The impact of Mathematics on meteorology and weather prediction

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## ABSTRACT

Mathematics has been responsible for so much in terms of our understanding and prediction of weather and climate. This contribution is perhaps most obvious in the context of the technology behind the observations and the simulations. In weather prediction, the Mathematical equation are non linear, which make the calculation more problematic. The typical way to analyze and simulate weather is numerical methods.

## INTRODUCTION

Weather and climate models are based on the Navier-Stokes equations and moist thermodynamics. applying systematic approximations to the Navier-Stokes equations, while retaining important properties such as conservation laws for energy and potential vorticity have resulted a deep understanding of what lies behind the choreography of weather, and this understanding is utilized in the design of numerical models.

## METHODS

Many features of the large-scale circulation patterns can be described by solutions of the shallow water equations. These equations are themselves much simpler than the Navier-Stokes equations. Using the shallow water equations as a vehicle to describe the salient mathematical ideas that help meteorologists to quantify some of the large-scale, often highly predictable.

## Literature Review

The shallow water equation in 2 dimensions is

$$\frac{Du}{Dt} - fv + g\frac{\partial h}{\partial x} = 0 \quad \frac{Dv}{Dt} + fu + g\frac{\partial h}{\partial y} = 0$$

$$\frac{Dh}{Dt} + h\nabla \cdot u = 0$$

The semi-geostrophic equation amount to the shallow water equation and it becomes

$$\frac{Dv_g}{Dt} - fv + g\frac{\partial h}{\partial x} = 0 \quad \frac{Dv_g}{Dt} + fu + g\frac{\partial h}{\partial y} = 0$$

$$\frac{Dh}{Dt} + h\nabla \cdot u = 0$$

The equations conserve energy and the following vorticity

$$q = \frac{1}{h} \left( f + \frac{\partial v_g}{\partial x} - \frac{\partial u_g}{\partial y} + \frac{1}{f} \frac{\partial(u_g, v_g)}{\partial(x, y)} \right)$$

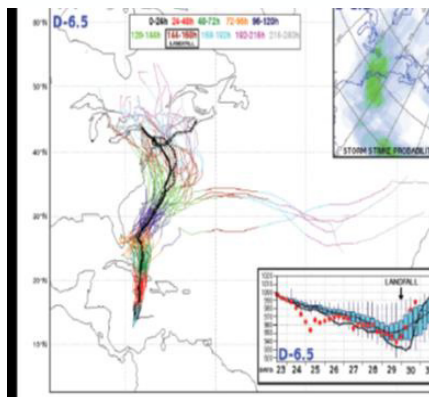
Defining new geostrophic coordinate which is called the geostrophic momentum coordinates

$$\mathbf{x} \equiv (X, Y) \equiv \left( x + \frac{v_g}{f}, y - \frac{u_g}{f} \right)$$

when we apply the geostrophic momentum of all the problem we finally get total energy of the shallow water equation

$$E = \int \left( \frac{1}{2}(u^2 + v^2) + \frac{1}{2}gh \right) h dx dy$$

The figure below shows the ensemble of forecasts for Sandy from the European Centre for Medium-Range Weather Forecasts covering the 10 days from the formation of the cyclone.



## SUMMARY and Outlook

Mathematics gives us considerable insight into the dynamics of the atmosphere and oceans. The improvement of great development of Mathematics and computer science has resulted the current reliability of weather forecasting. In some cases, numerical methods fail to capture the big picture which would make the forecast unreliable. Using the semi geostrophic equations, we can pick apart the predictable part from the unpredictable. Thus we can focus our resources on observing the forecasting on the predictable part in large-scale patterns. However, using the Navier-stokes equation strictly would focus on the who problem and the results will not be stable and similar because of the non-linearity of the problem.

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# Enhance Heat Transfer Efficiency Using Nanofluids & Surface Modification

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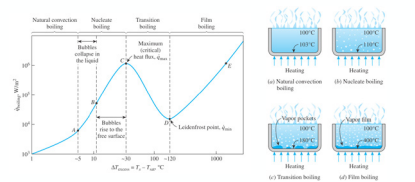
## ABSTRACT

Heat transfer efficiency is one of the key roles in energy saving as well as to meet the demand of the advancement of technology. Boiling has been proved as the efficient heat transfer mechanism than single-phase heat transport. This study investigates the effect of using different type of nanofluids and heater surface modification on boiling heat transfer. Nanofluids, nanoparticle dispersed in base fluid, have attracted enormous attention from the scientists due to their highly thermal conductivity. The main objective of this research is to develop advance cooling system to improve the heat transfer efficiency and to be applied in commercial use. It combines the high thermal conductivity of nanofluids with the tunable surface characteristic of nanostructure.

## BACKGROUND

Boiling is one of the most efficient heat-transfer mechanisms because of its high performance due to latent heat transport, thus allowing to reduce size, weight and volume of heat exchange devices and improve the thermal performance. Therefore, boiling heat transfer plays a very important role for a wide number of applications in many technological and industrial areas.

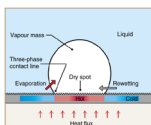
The advantage of boiling heat transfer is that a high heat flux can be removed passively (does not require external energy) with a minimal temperature difference. However, the heat removal capacity is limited by the upper limit of cooling, i.e., the critical heat flux (CHF), where the heat transfer coefficient (HTC) decreases dramatically.



## RESEARCH OBJECTIVES

### CHF Enhancement

The CHF is enhanced by improving the ability to actively wet the heater surface



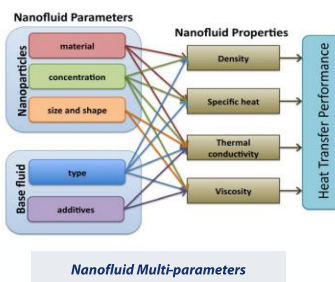
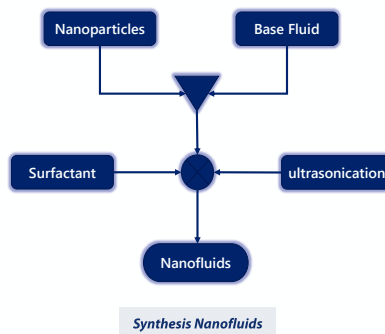
### HTC Enhancement

The HTC is improved by increasing number of bubble nucleation



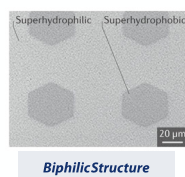
## PROPOSED METHODS

### 1. Using Nanofluids

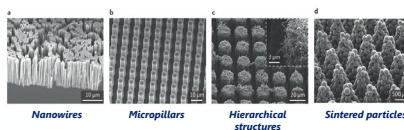


### 2. Surface Modification

To improve both CHF and HTC, it requires dual wettability surfaces which inspired "biphilic surfaces" (surface that spatially varying wettability)

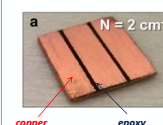


The hydrophobic regions are designed to promote vapor nucleation (improve HTC), whereas the hydrophilic regions suppress lateral expansion of the bubbles and thus can prevent film vapor (increase CHF)



## PROPOSED METHODS (CON'T)

Other strategy to improve both HTC and CHF through controlled nucleation by spatially varying thermal conductivity of heater surface (called "Bi-conductive Surface")



**Advantage of Bi-conductive surface :**

- ✓ High thermal performance
- ✓ Cheaply manufactured
- ✓ Thin coating
- ✓ Easy implementable
- ✓ Insensitive to degradation over time
- ✓ No mechanical failure

Heat is conducted to the liquid mainly through the copper, while the epoxy remains thermally insulated.

The surface temperature becomes non-uniform with the copper being hotter than the epoxy. Therefore, nucleation is activated only on the copper surface. The region above the epoxy serves as a liquid pathway to prevent film boiling.

## SUMMARY

- Boiling heat transfer is considered as the most efficient heat transfer mechanism, however the vapor film phenomena at critical heat flux deteriorate their heat transfer efficiency
- To improve the performance of heat transfer, both critical heat flux (CHF) and heat transfer coefficient (HTC) need to be enhanced
- Nanofluids with high thermal conductivity than pure liquid can improve heat removal capacity. However, their stability is weak. Further study on nanofluid stability need to be addressed first before use in commercial application.
- Surface modification seems to be promising technique in order to improve boiling heat transfer

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# Fabrication of Microelectrode Arrays on Thin Film Electrodes

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## ABSTRACT

This poster explores the degradation of poly benzene-1,3-diol films in caustic solutions. A polymer film was deposited on Micrux<sup>®</sup> thin film gold electrodes ( $A=0.080 \text{ cm}^2$ ). The electrochemical behaviour of the material was studied by cyclic voltammetry. The final morphology was investigated by scanning electron microscopy (SEM). This study allows the production of such microelectrode ensembles in a cost-effective manner and a platform for a wide range of applications such as sensor technology.

## INTRODUCTION

Microelectrode arrays are electrode platforms with a geometrically ordered regime of electrodes available in various sizes and shapes. They can be used in many applications and technologies such as in sensors [1], batteries [2], catalysis and electrocatalysis [3] and the study of mass transport phenomena [4].

In the present study, microelectrodes arrays were fabricated from the degradation of poly benzene-1,3-diol films by exposing the blocked electrodes to  $1.0 \text{ mol dm}^{-3}$  caustic solutions for a defined period. The concentrations of the monomer and caustic solutions along with area and types of the electrodes varied.

## METHODS

- All chemicals used without further purification.
- Benzene-1,3-diol (>99%),  $\text{K}_3\text{Fe}(\text{CN})_6$  (>98%), KCl (99%),  $\text{K}_4\text{Fe}(\text{CN})_6$  (>98%), and NaOH (98%), Aniline (>99.5%) was procured from Sigma Aldrich, Germany.
- Micrux<sup>®</sup> gold electrodes (Ref.ED-SE1-Au) were purchased from Micrux technologies, Oviedo (Asturias), Spain.
- All experiments were carried out in a three-electrode glass cell. An EZstat Pro potentiostat (NuVant Systems Inc., IN, USA) equipped with an EZware 2013.
- Morphological features of the electrode surfaces were examined at different magnifications, using SEM (FEI Company, INSPECT S50, Czech Republic).

## Literature Review

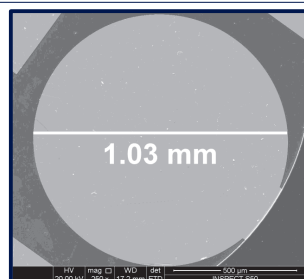
Myler *et al.* have sonochemically fabricated a polymer modified glucose oxidase microelectrode array with population densities up to  $2.5 \times 10^5$  electrodes/ $\text{cm}^2$ . [5] This was accomplished by first electrodepositing an insulating polymer on commercial screen-printed electrodes followed by ultrasonication, to generate regular-sized pinholes in the polymer film. Rossem *et al.* reported the fabrication of novel sensing arrays for measuring dissolved oxygen concentrations in sample solutions. The sensor was fabricated from platinum and oxide-nitride-oxide as an insulating material, and electrodes were recessed in a glass substrate. [6] Tiggemann *et al.* fabricated a so-called electronic nose from microelectrode arrays based on polyaniline films on graphite electrodes. They doped with different acids such as camphor sulfonic and dodecylbenzene-sulfonic acids to distinguish three artificial aromas: strawberry, grape and apple. [7]

## CONCLUSIONS

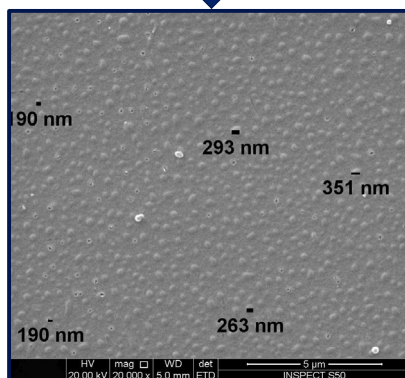
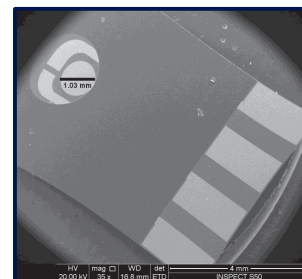
This work has mainly focused on the fabrication of microelectrode arrays on thin-film single electrodes by means of wet chemical etching. The electropolymerized electrodes were treated in caustic solutions for definite time.

If the caustic concentration and exposure time were properly controlled, microelectrode arrays would be formed. SEM analysis revealed that the formation of regular bumps at the modified electrodes was successfully formed on the surface of the electrodes upon caustic exposure. Moreover, the area of the electrodes was found to have a significant influence on the entire process of microelectrode arrays fabrication. This study provides useful information for researchers to fabricate such microelectrode arrays in direct, accurate and cost-efficient technique.

Close up image of the working electrode (250 x)



Micrux<sup>®</sup> Electrode (35 x)



Dimensions of bumps of polyaniline marked in (20 kX)

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# Optimising concrete materials and study of concrete pathologies (Aging of concrete)

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## ABSTRACT

This research proposal aims to determine such the extension of operation of the Nuclear Power Plants up to 60 years (in France) or even to 90 years (for some other countries) which must be taken into account so as to deal with the **containment building aging** has to be addressed being faced by the structure sector. In doing so, the paper will carry out the review of different research studies which have identified the pathologies that affected the reinforced concrete of the containment building. Thus, this research paper will study different parameters effects on concrete aging and how that will implement in such a country like Saudi Arabia with different weather conditions.

## INTRODUCTION

- There are a huge tendency towards increasing the life of operation of NPP from 40 to 60 years.
- Ability to assess for each component of the power plant to fulfill its safety requirements.
- The containment building is the third and last safety barrier between the radioactive material and the environment.
- There is a significant concern regarding to aging which may affect the safety of containment building.

## METHODS

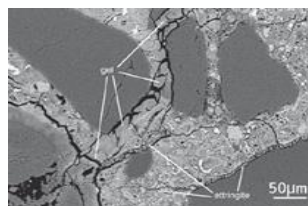
- Experimental platform.
- Some measurements need to assess, In-situ like Humidity, Temperature....
- Furthermore, destructive and non destructive examinations will be measured.



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## Literature Review

- Large international database from laboratory experimentation.
- Need to assess scale effect (gradients) or concrete confining effects (rebar, pre-stress).
- Little knowledge about coupling between phenomena.
- Need to validate NDE means for early detection and monitoring.
- Study of Concrete ageing pathologies and it will cover such as, corrosion of reinforcement concrete, internal swelling.



Concrete affected by ASR



Station for water effluents management

Nuclear power plant

- 1,700 m<sup>2</sup> (18,000 ft<sup>2</sup>) platform.
  - 60 large scale experimental blocks – size: 2 x 1 x 4 m
- Station for water effluents management

## SUMMARY

- **Ageing of structures** is a main issue because of the extension of NPP operation up to 60 years in France and even up to 80 years in the USA: most of 58 French PWRs will reach the age of 40 years between 2019 and 2032,
- New nuclear facilities (like EPR) should be operated for 60 years and, by the way, **waste management** facilities require a reversibility period of at least 100 years.
- **Containment buildings'** safety requirements (stability and tightness) have to be assessed for both normal operation and accidental situation, taking into account the main phenomena associated to concrete structures ageing.

## CONCLUSIONS

- As the research of extending NPP operation life, IRSN have launched this project to study the pathologies of concrete.
- Impact of these pathologies on containment building behavior.
- Specific experimentation ("hot weather conditions") on the ODE platform
- Impact of climate conditions that may speed up ageing of concrete

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## Outdoor Parking Control System Using Image Processing & Li-Fi Communication Technology

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## ABSTRACT

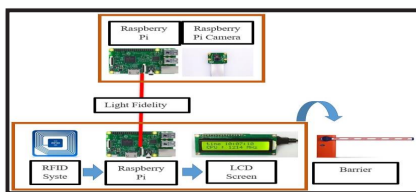
Recently many new technologies have been developed that help in solving the parking problems to a great extent the traffic generated by cars searching for parking spaces takes up to 40% of the total traffic, with a huge impact on the mobility and quality of life of residents. In this work, we introduce a system that allows drivers to effectively find and reserve the vacant parking spaces. By periodically learning the parking status from the image processing deployed in parking lots, the reservation service is affected by the change of physical parking status. The collected data at the parking spaces are transmitted to the main controller using Light Fidelity (Li-Fi) technology to ensure high and efficient data transmission. A programmed RFID system is used to scan the user card to check if he/she is allowed to be entering or not. In this work, a Raspberry Pi module is programmed to be used for data capturing, communicating and analyzing.

## INTRODUCTION

In the past two decades, the concept of intelligence in terms of smart parking systems became more popular in the most vibrant cities, especially in malls and shopping centers. In the mid-80s, the systems used for parking relied mainly on the traditional method of pushing a button in the device next to the checkpoint to get a parking ticket and on exiting, the driver must pay before inserting their ticket in order for the barrier to rise. This was the method used to determine how many cars came in and out the system each day, and it was used to count the number of vacant spaces available [1]. It began by utilizing different methods such as sensors or barriers to be able to know the status of parking lots. All these methods developed dramatically further until recently the term 'smart city vision' emerged. Li-Fi is a new wireless communication technology that enables a wireless data transmission through LED. This means that everywhere where LEDs are used, lighting bulbs can bring not only the light but also wireless connection at the same time. RFID tags are small transponders that respond to queries from a reader by wirelessly transmitting a serial number or similar identifier. They are heavily used to track items in production environments and to label items in supermarkets. They are usually thought of as an advanced barcode.

## METHODS

The system implemented in this project consists of two main parts: (1) receiving part, and (2) transmission part. As shown in Fig. 1, the camera will take images of the parking spots and transfer them to the microcontroller and analyze them to find if there is any available parking spot, and the location found. The data will be sent to the receiver as pulses through laser light (Li-Fi) each 5 seconds.



### Fig. 1 System Overview

## Literature Review

Kim and et. al. proposed a smart parking information system ... technology to help drivers getting the real time parking information as well as direction guide. By providing accurate information on available parking spaces, drivers save time and fuel and increase efficiency of the parking process. There for the proposed system not only gives you the illumination function of LED but also the function of communicating in the manner of application based on the VLC [2].

This paper proposes an intelligent parking system to solve the problem of unnecessary time consumption in finding the parking spot in commercial car park areas by using image processing techniques is given in [3] . A parking management system is designed in such a way that it provides the information about the available parking lots and also it involves the automated payment system for the registered users. Thus the designed system will completely eliminate the hassle in searching the available parking lots and it could be applied everywhere due to its ease of usage and effectiveness.

This paper discussed on automatic parking system and electronic parking fee collection based on vehicle number plate recognition. The aim of this research is to build up and implement an automatic parking system that will increase convenience and security of the parking lot as well as collecting parking fee without hassles of using magnetic card. The smart parking system will able to have fewer interaction of humans and use no magnetic card and its devices [4].

Bhor and et. al. introduced an image processing based parking solution is proposed where a camera placed overhead the parking space captures image of the parking space and a raspberry Pi processor attached to the camera processes the image to display number of empty parking slots available for parking for the driver's information [5].

The effectiveness of the proposed scheme is validated through experiments in an indoor environment [6].

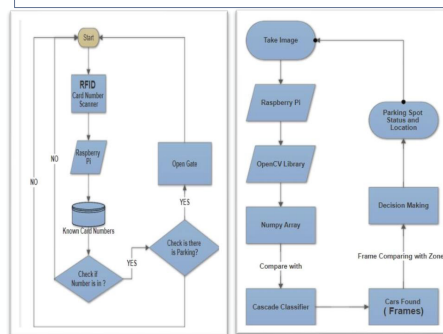


Fig. 2 System Algorithm

### Fig. 3 Image Processing Algorithm

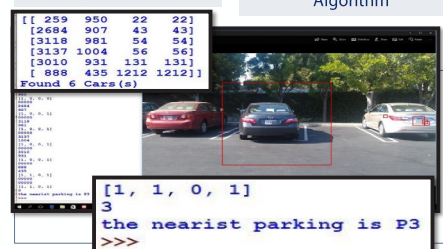


Fig. 4 The system is in process

## SUMMARY

In this work, we introduce a fully automated system, that using new technologies such as Li-Fi which integrated with RFID to a gate barrier using our modified image processing algorithm.

The given system has many advantages via on-shelf systems as illustrated below:

1. It used a CCTV monitoring system.
2. It is very complex secure system.
3. The transition and receiving data are very secure and efficient.
4. High speed data analysis.
5. The produced system has a long range communication (reaches to 245 meters).
6. Very cheap system (few hundreds dollars).
7. Easy to install.
8. Low cost (simple plug and play).
9. Light weight and low profile system.

## CONCLUSIONS

We introduce a fully automated system that allows drivers to effectively find the available parking spot and reserve the vacant parking spaces number. Image processing technique is used to periodically learning the parking status in parking lots where the reservation service is affected by the change of physical parking status. As the RFID system explained , we were able to connect it to a raspberry Pi, which was easy and flexible to use. We could store the IDs of the RFID and manage to add and remove IDs with our database. In order to make the system even smarter, we installed a screen in our system that can tell how many parking spots are available in the parking area, and it can indicate the nearest parking available. Indirectly with a raspberry Pi camera, information about the selected parking area will be updated every 2.3 seconds. This camera can detect all kinds of cars with high quality images. These data will be sent fast through light to the original raspberry Pi. This is where LIFI technology takes place and it is efficient. At the gate we managed to have a screen that displays this information about parking searching procedure. The gate will open once the system authorize the ID card and finds available parking.

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# Suitably selection for earthwork equipment In construction sites

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## ABSTRACT

The objective of this paper is to develop a simplified model to support construction managers and contractors for estimating time and cost of heavy earthwork operations. Economical operation analysis is conducted for equipment, taking into consideration owning and operating costs of earthwork operations. The model was developed by Java programming code and is capable to integrate with other modules by using features of estimation and optimization. The model implementation shall give optimum equipment selection, not only based on versatility, but also cost effectiveness.

## INTRODUCTION

Complexity of today's building projects makes it harder to evaluate alternatives of equipment and take the right selection from many alternatives, Pourifoy et al. (2006). With the growing awareness of the role played by mechanization and industrialization in project execution, the decreasing availability of skilled manpower, and tight budget and schedule constraints in a competitive construction environment, companies and project management teams often lack the tools to select the best combination of grouped equipment suitable to meet project requirements. Equipment selection is a critical factor in the execution of many construction projects. This is to be much more critical in heavy construction projects where the earthmoving equipment plays a vital role in performing the work. In this type of projects, heavy equipment may represent the largest portion of bidding price, Moselhi and Marzouk, (2000).

## METHODS

Economic analysis for selecting equipment type is considered essential for developing the optimization model. In this paper, the developed model allows users to attain optimized equipment for various types of earthwork. The analysis operation is performed in eight major activities of earthwork. The economic analysis is carried out while taking into consideration variable factors affecting the equipment productivity. The summarized conceptual model of research is shown in Fig. 1.

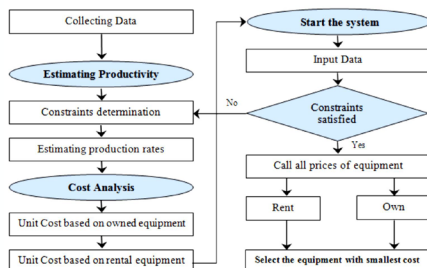


Figure 1: Research Conceptual Model.

## RESULTS

As a response to the earthmoving equipment, various methods and models had been discussed previously in literature. However, the majority of studies did not consider economical operation analysis. Instead, the studies focused on developing systems, algorithms, or a framework to assist the user for selection of earthmoving equipment in heavy earthwork operations. Moreover, most of these studies included time and cost estimation at the conceptual stage of the project; however, this study includes economical operation analysis at the conceptual stage and following the commencement of the project. Furthermore, the proposed model is being developed to incorporate owning and operating costs of selected earthmoving equipment configuration. Actual construction project is selected. This project is considered to illustrate the use of developed framework in selecting near-optimum minimum duration with minimum cost from a set of excavator's models. It also demonstrates the ability of the framework in conducting time-cost tradeoff analysis. The project, being considered, involves excavating 239,970 m<sup>3</sup> bank volume of common and loose soils from a real case study of large-scale project with area 521,185 meter square. Table 1 summarizes the scope of earthwork in terms of two soil types with time and cost comparison. The challenge was to select the optimum excavator equipment necessary to execute the construction site. The developed model was capable of selecting the optimum equipment model as shown in Fig. 2.

Figure 2: Model Results Form.

TABLE 1: SCOPE OF EXCAVATION WITH TIME-COST COMPARISON.

Scenario	Soil Type	Stage 1		Stage 2		Stage 3		Total	
		Time Hrs.	Cost SR	Time Hrs.	Cost SR	Time Hrs.	Cost SR	Time Hrs.	Cost SR
Model Data	Common	120	96,000	87	69,600	123	100,000	330	265,600
	Loose	113	93,500	131	104,900	124	99,200	368	297,600
	<b>Total</b>	<b>233</b>	<b>189,500</b>	<b>218</b>	<b>174,500</b>	<b>247</b>	<b>199,200</b>	<b>698</b>	<b>563,200</b>
Actual Data	Common	141	112,800	96	76,800	116	92,800	353	282,400
	Loose	110	88,800	145	116,000	127	101,600	382	306,400
	<b>Total</b>	<b>251</b>	<b>201,600</b>	<b>241</b>	<b>192,800</b>	<b>243</b>	<b>194,400</b>	<b>735</b>	<b>588,800</b>

## SUMMARY

For comparing the results, the optimizer needs to understand the differences between the two results in order to understand model limitations. The obtained results were compared with actual project data and were found in good agreement with a percentage difference ranging between 5% - 21%. It should be noted that the model eliminated the CAT-390 D L Hydraulic Excavator from the optimization process because the limitation of constraints, while actual action in studied project selected CAT-365 C L Hydraulic Excavator. Comparison of results is illustrated in Table 1.

## CONCLUSIONS

Optimizing equipment selection in heavy earthwork operations is a critical key in the success of any construction project. It was developed a computer model to assist contractors and construction managers in estimating the cost of heavy earthwork operations. Economical operation analysis was conducted for an equipment taking into consideration the owning and operating costs involved in earthwork operations. The model is developed by using Java programming code and is capable of integrating with other estimation and optimization modules. The implementation of the model shall give optimum selection of equipment, not only based on cost effectiveness, but also in terms of versatility. For more accurate results, data should always be obtained from the actual site and historical data.

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# Modelling of encapsulation of Cystine amino acid inside a single-walled carbon nanotube

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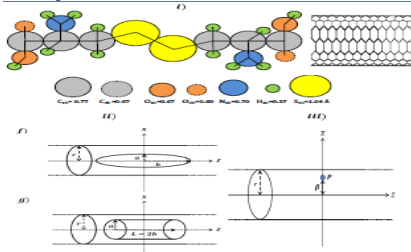
Published on October 2017: Modelling of encapsulation of Cystine amino acid inside a single-walled carbon nanotube, *Journal of Material Express*, 7(1):389-397, (2017)

## ABSTRACT

Carbon nanotubes are very important types of nano-materials that are capable of transportation of different biomolecules, through their external and internal walls, to the targeted cells. In this paper, we model the interaction which is arising from the encapsulation of Cystine amino acid inside a single-walled carbon nanotube. Carbon nanotube are selective and excellent nano-devices because of their huge potential that is used in protein delivery and disease treatment. We consider two possible structures as models of Cystine amino acid which are an ellipsoid and cylinder group of atoms. We adopt the Lennard-Jones potential and continuum approach to obtain the interaction energy for each configuration. Our results indicate that the radius of nanotube plays a critical role in determining the magnitude of total energy and the encapsulation of Cystine occurs when  $r > 3.391 \text{ \AA}$  which are in a very good agreement with recent experimental studies. Our model predicts that the scientific researchers could design and develop new nano-devices with distinct properties to avoid the energetic barriers and increase the ability of nanotube for maximum loading of targeted drug delivery.

## INTRODUCTION

- Nanotechnology has recently gained a great interest to study the applications of extremely invisible things and can be used across all modern scientific fields, such as medicine, engineering, physics and chemistry. In 1959, Nanotechnology concept had started by the American physicist Richard Feynman's idea entitled "There is a plenty of room at the bottom."
- Amino acids are a family of significant biological compounds which are containing different functional groups, that are classified into two sub-families upon; proteinogenic and non-proteinogenic, and they play major roles in nutrition and other biological functions in the human body, such as Histidine, Alanine, Cystine and other types of amino acids.
- In our model, we aim to investigate the encapsulation of Cystine amino acid inside SWCNTs of radii  $r$  as shown in Figure 1.



## METHODS

- In this paper, we assume that the encapsulation of Cystine inside a SWCNT as a physical adsorption model obtained mathematically by van der Waals forces. We use the continuum approach and Lennard-Jones potential together to model the van der Waals interaction of Cystine amino acid inside the SWCNTs of various radii  $r$ . The Lennard-Jones potential is given by

$$\Phi(\rho) = -A\rho^{-6} + B\rho^{-12} = 4\epsilon[-\sigma^6\rho^{-6} + \sigma^{12}\rho^{-12}] \quad (1)$$

Therefore, the distance from point  $P$  to typical surface element of the cylindrical tube given by

$$\begin{aligned} \rho^2 &= (r \cos \theta - \beta)^2 + r^2 \sin^2 \theta + z^2 \\ &= (r - \beta)^2 - 4\beta r \sin^2(\theta/2) + z^2 \end{aligned} \quad (2)$$

## METHODS

the interaction energy is given by

$$\begin{aligned} E_a &= \eta_c \int_V \Phi(\rho) dV \\ &= \eta_c \int_V (-A I_3 + B I_6) dV \end{aligned} \quad (3)$$

- The Cystine amino acid has two possible structures; Spheroidal and Cylindrical, can be obtained as follows

## Literature Review

- Over the past few decades, long-term studies have discussed the combination of carbon nano-materials with different biomolecules as safe agents for drug delivery system. They can be conjugated with various biomolecules and delivered to the targeted cells.
- The adsorption of amino acids inside a single-walled carbon nanotube (SWCNT) is carried out. [1]
- The non-covalent interaction energy between different amino acids and carbon nano-devices has been investigated by using the density function theory (DFT) and the Moller-Plesset perturbation theory (MP2). [2,3]
- The DFT method has been experimentally used to calculate the encapsulation of Cystine, Phenylalanine, Histidine and Glycine inside the (13, 0) SWCNT. [4]
- Furthermore, the experimental results of the most recent studies used MDSSs show that the minimum energies which are arising from amino acids interacting with CNTs occur in the middle of nanotube in the range of  $-0.1$  to  $-0.8$  kcal/mol which are very small compared to that of gas molecules and nucleic acid of approximately 20.8 and 20.1 kcal/mol. [5-7]
- Here, we propose a mathematical model by assuming the Cystine amino acid in two possible configurations, as a spheroidal (Figure 1(ii)(b)) structure (an ellipsoid) and cylindrical (Figure 1(ii)(g)) shell, each configuration interacting with a SWCNT which is assumed to be characterized and well-defined as a perfect cylinder SWCNT.

- Spheroidal Model:** From the work of Thamwattana, [8] the interaction energy between a spheroidal molecule and a cylindrical nanotube is given as

$$\begin{aligned} E_d &= \eta_s \int_V E_a(\beta) dV \\ &= \eta_s \eta_c \int_V (-A I_3(\beta) + B I_6(\beta)) dV \\ &= \eta_s \eta_c \int_V (-A K_3 + B K_6) dV \end{aligned}$$

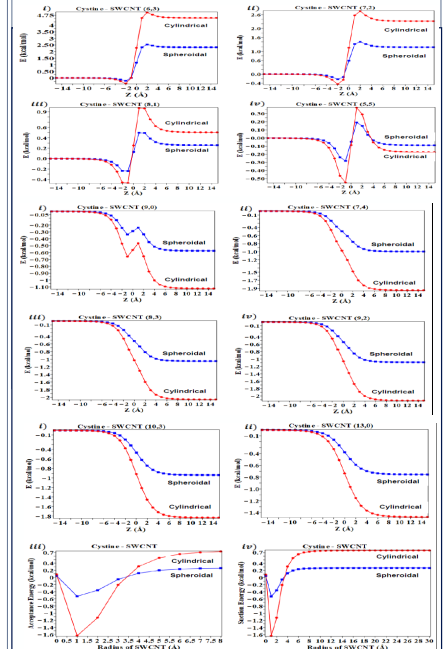
$$\begin{aligned} K_n &= \frac{8\pi^2 a^2 b}{3r^{2n-2}} \beta(n-1/2, 1/2) \\ &\times \sum_{m=0}^{\infty} \frac{(n-1/2)_m (n-1/2)_m}{(5/2)_m m!} \left(\frac{a^2}{r^2}\right)^m \end{aligned}$$

- Cylindrical Model:** From the work of Thamwattana, [8] the interaction energy between a cylindrical shell and a cylindrical nanotube is given as

$$\begin{aligned} K_n &= \frac{4\pi^2 a^2 L}{3r^{2n-2}} \beta(n-1/2, 1/2) \\ &\times \sum_{m=0}^{\infty} \frac{(n-1/2)_m (n-1/2)_m}{(2)_m m!} \left(\frac{a^2}{r^2}\right)^m \end{aligned}$$

## SUMMARY and Outlook

- The potential energy arising from Cystine-SWCNT interaction is evaluated for various sizes of nanotubes.
- Our findings show that a SWCNT with radius  $r \geq 3.391 \text{ \AA}$  will accept the Cystine molecule for both configurations. They also indicate that the nanotube of  $r < 3.391 \text{ \AA}$  has energetic barriers which prevent the Cystine amino acid to be encapsulated inside those nanotubes.
- Overall, our results are completely consistent with Ganji's findings who use the density function theory (DFT) to calculate the total energies of different amino acids inside SWCNTs and his results indicate that the minimum interaction energies are in the range of  $-0.1$  to  $-0.8$  kcal/mol. [27]



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# Creative Strategizing in Advertising: A Saudi Arabian Exploratory Study

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## ABSTRACT

The adoption of a strategy-as-practice approach changes the focus from just strategies to strategists and what they do and say; exploring how their micro-activities are explained on an organisational level (Whittington, 2006). This shifts the predominate focus from organisations to individuals, especially in relation to the creation and development of strategy (Rengér, 2003). To this end, it becomes important to focus on strategists' activities and how they enable the creation of a specific strategy (Whittington, 1996; Jarzabkowski et al., 2007). The focus of this study will be on the strategists themselves (Paroutis and Pettigrew, 2007), and how they come up with their creative strategies in relation to the context. This is different from mainstream strategy research in that here, strategy is seen as something people do rather than something that organisations have (Whittington, 2004; Jarzabkowski, 2004; Johnson et al., 2007; Whittington and Cailluet, 2008).

## INTRODUCTION

The importance of practice has been realised in the field of advertising, through calls for narrowing the gap between academics and practitioners by investigating the ways that agency practitioners think about advertising theories (Nyilasy and Reid, 2009). Such studies aim at practitioners and exploring what they know about advertising. This perspective brings attention to the importance of practice in the field of advertising. In this study, we go beyond this; we will explore the strategists themselves and how they reach their creative strategies.

## METHODS

In this study, the researcher links agency-creativity to advertisements' outcomes and discuss how cultural context effects these decisions. Thus, the paper adopts qualitative methods that are suitable for investigating advertising within different cultures (Taylor et al., 1996). This is the case, because different cultures call for different focuses in relation to product advertising (Hall and Hall, 1990).

## Literature Review

While advertising literature usually discusses the benefits of global campaign strategies, Middle Eastern creative directors view global advertising strategies differently than local campaign strategies. According to Taylor et al. (1996, p. 2), "Advertising is clearly a cultural phenomenon, culturally inspired and created within the expectations of a culture." Wei and Jiang (2005) argue that an international creative strategy can be feasible as long as the execution of that strategy accounts for culture, a conclusion drawn from their investigation of Nokia's case in China. Here, they show the different types of executions that allowed a global creative strategy to succeed locally by abiding to some cultural sensitive criteria.

This sensitivity in cultural campaigns is a note that Jeong et al. (2002) point out through their research that focuses on Korean account managers and creative directors who are working in subsidiaries of global agencies. They report how important it is to include these personnel in advertising plans. They add that these directors have negative experiences with the standardisation of global advertising. Pointing to the crucial role locality plays in the execution of global strategies, especially through the personnel who are culturally sensitive to the local environment.



What?

How?

This paper aims to answer the question of how cultural context effects how strategists make strategic creative decisions in the advertising filed in Saudi Arabia.

## SUMMARY

Creativity takes up a rather large portion of research within advertising. Some studies focus on creativity regarding the advertising decision-making process by focusing on a single agency (e.g. Mondroski et al., 1983). The focus in such studies is put on 'the who' in relation to making a creative advertising decision and the linear sequence of making a decision. Yet it does not delve into issues of how creative-directors get to these creative ideas and on what basis they are chosen, which is the main focus of this study.

## CONCLUSIONS

Advertising creativity, in reference to producing creative advertisements, can be in relation to the audience and what they perceive to be creative, and to the agency and what creativity it produces (Li et al., 2008). In this study, the researcher links agency-creativity to advertisements' outcomes and discuss how cultural context effects these decisions.

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# THE REPRESENTATION OF WOMEN DRIVING IN VISUAL ADVERTISEMENTS IN SAUDI ARABIA

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## ABSTRACT

### Goal

The research aims to understand in which way the topic of Saudi women driving is represented and tackled in visual advertising in Saudi Arabia. In particular the research focuses on different sources in traditional and digital media: magazine, billboards, posters, social media posts. Qualitative research tools (like focus groups) in addition to semiotic analysis will be used to investigate a large number of texts focusing on the different elements of the advertisements in order to identify the different strategies and embedded principles founding the communication.

### Hypothesis

Our hypothesis is that different sources of advertising, even if with a common "positive" background, will differ in the symbolic interpretation of the new phenomenon and that this different interpretations reflect the complexity of the socio-cultural background of Saudi society.

## INTRODUCTION

The Royal Decree allowing women to drive in Saudi Arabia has been considered inside and outside the country as a major change in society, both for its practical consequences and for its symbolic power.

As in all moments of changes, communication, in all its different means and manners, plays a determinant role.

The Saudi culture has been experiencing many social and cultural changes and communication has played a role in providing a new "layer" of the social common background.

In this context different means of communication can have specific influence and impact on society, providing information, perspectives, role models and perceptions.

In particular advertisements have a major role in offering role models and symbolic interpretations of the phenomenon. Advertisement messages and contents might be different according to the brand and the communication medium and will provide the target segment with explicit suggestions but even implicit embedded values.

## METHODS

In the first part of the research an exploratory research with different focus groups will be in conducted in order to have initial insights from Saudi young people, comparing perceptions from different genders.

A corpus of visual advertisements will be chosen in order to build a sample representative of women driving related ads in Saudi Arabia.

Then the corpus will be analysed through content linguistic analysis and visual semiotic tools.

Also Focus group, constituted with representatives of different typologies of public, will be held in order to verify if the results of the previous analysis are aligned with the public perceptions.

Conclusion will be written about the different symbolic interpretations and suggestions to the advertising industry will be provided.

## PRELIMINARY RESULTS

Three focus groups have been conducted with JCA students with in total 24 participants from both genders.

During the focus groups results of an Ipsos research about the perception of the lifting of women driving ban were discussed. Furthermore ads related to Saudi women driving were analyzed with the participants.

The first findings showed that there is a common belief, between the two genders, about the importance of the implementation of practical measures in order to assure road safety and respect of women driving.

Respondents from the two genders differentiate in the perception of video advertisements, about women driving, showed to them.

In particular women did not appreciate ads where the fact of driving is showed as a concession from the father and where the situation is representing in a cultural stereotypical context. Women, on the other hands, were pleased to watch ads showing ladies presenting their points of views and doubts.

Men seemed to prefer an ironical approach and ads showing a traditional relation between father and daughter as they think a kind of "mediator" could help women to enter in the new situation.

## LITERATURE REVIEW

Saudi Arabia is the largest advertising market in the MENA region, accounting for 40% of all advertising expenditures in the Gulf. Saudi Arabia with its new market-oriented economy, has become an important location of producers of consumer goods, and one of the most relevant target of the best international advertising firms.

In the last years there has been a noticeable increase in the presence of women in the advertisements in KSA. In some cases it is characterized by different stereotypes. Throughout history there have been many studies that proved women were mainly portrayed on television advertisements as housewives or occupations that are subservient to men. Advertising has many effects on society. As a result of not being in as many commercials as men, and as being mostly represented in domestic roles, at very young ages boys and girls conclude that men have a prominent role in society.

In 2017 Saudi Arabian TV ad market is expected to generate 56 million U.S. dollars. During a 2015 survey, 70 percent of internet users in Saudi Arabia trusted TV Ads. This was the highest result among all traditional media. In 2015, internet penetration in Saudi Arabia amounted to 72.7 percent. This shows the importance and the potentiality of the role of advertisements in KSA.

This research can help companies to produce advertisements related to women driving using better strategies that can be aligned with people and society perceptions regarding this topic.

## EXPECTED RESULTS

Contribute to a better understanding of women driving change in society through the mirror of communication.

Help advertising industry to find communication strategies related to the Saudi cultural background.

Empower the younger generation through a communication that challenges gender stereotypes.

Contribute to give "communication providers" in all fields, and in particular in the advertising industry, both Saudi and non-Saudi, scientific information and well documented point of views in order to implement their new communication strategy, and in particular the strategy related to women driving.

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# Colouring of the Surfaces of Three-dimensional Polytopes (The Four-Colour Theorem)

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## ABSTRACT

The four colour map theorem states that, given any separation of a plane into contiguous regions, producing a figure called a map, no more than four colours are required to colour the regions of the map so that no two adjacent regions have the same colour. Two regions are considered to be adjacent if they share a common boundary that is not a corner (a point shared by three or more regions).

The theorem was first proposed in the 1850s and attracted considerable attention until it became the first such theorem to be proved by computational methods in the 1970s.

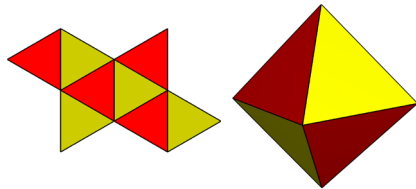
This poster will describe the four colour theorem and explore how the theorem could be extended to three-dimensions and how such an extension could apply to the field of design.

We restrict our study to the colouring of the surfaces of three-dimensional polytopes or polyhedra, specifically those that are convex.

Visual examples will be provided for regular polyhedral of increasing number of polygonal faces.

## INTRODUCTION

The aim of this study is colouring of three-dimensional surfaces. Differentiations between 2-D maps and 3-D surfaces are then presented. Also, illustrative material will help to address the minimum number of colours needed to colour different polytopic surfaces and the implications of this to the field of the design will be discussed.



Two-colourable octahedron

## METHODS

In order to analyse 2-D and 3-D patterns it is important to define all the concepts involved in this paper.

Firstly,  $M$  for map,  $V$  for vertices,  $E$  means edges and  $F$  considering faces, and  $G$  means graph. Any plane with contiguous regions presents a map and the 4CT states that no more than four colours are required to colour each region under the condition that no two adjacent regions have the same colour. Like-coloured regions can share a point vertex but not an edge. The conjecture  $c$  made by Guthrie can be stated that:  $v(G) \rightarrow \{0, 1, 2, 3\}$  which means that for every edge of  $G$  with ends of  $u$  and  $v$ ,  $c(u) \neq c(v)$  (Bleecker 1996).

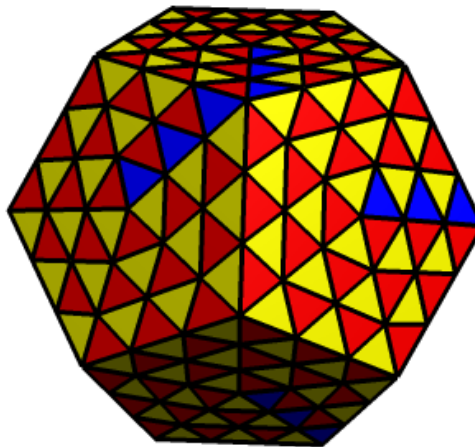
Regular polyhedra or polytopes can be generated in any number of dimensions. A polygon is an example of a 2-D polytope whereas a polyhedron polytope is 3-D type. In this paper a proof of the 4CT in the 3-D case is considered from a design perspective with more complete independent hand-checking, which could be easier and clear to understand. As our focuses is on the artistic, imaginative and creative aspect rather than mathematical, we deformed the regular convex polyhedron with more  $E$  and  $V$  than the original, but have the same geometry and same angle. The portions of  $F$  increased lead also to a net increase. Therefore, for a surface it required  $n$  different colours at the condition that no two adjacent  $E$  has the same colour.

## RESULTS

Most work that has addressed extending 4CT to 3-D has considered solids (rather than surfaces) and the question of whether they share an  $F$  (rather than an  $E$ ).

Of course, for the 2-D or 3-D surface, it can be always subdivide such that each  $N$ -sided face becomes  $N+1$  faces by connecting midpoints of subsequent  $E$ , creating  $N$  triangles around the  $E$ , plus one new  $N$ -gon in the middle (in this case  $N$  is the new vertices); then, we can colour all the triangles the same as the original face, and give the inner face any other colour thus maintaining the same number of colours as we aimed. Also, if the face is not a triangle, it divides the  $N$ -gon into  $N$  triangles with an extra vertex at the face's centre.

Then each edge is divided into  $L$  segments, where  $L$  is the subdivision level chosen and the new  $V$  connected with new  $E$ . From view point of this study, it seems that the possibilities of colouring regular polyhedral with increasing number of polygonal  $F$ ,  $E$  or  $V$  seems to be easier when having symmetries background, especially that the same manner could be extended from the 2-D planned (regular repeating) design in to 3-D surfaces.



Three-colourable dodecahedron

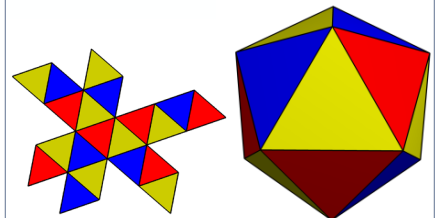
## SUMMARY

On one hand, computer programmes known to be error-prone, and not easy to check the formal of mathematical theorem.

From this point, it might said that maybe because of the complex strategy and mathematical approached which has been used so far trying to solve and understand this theorem, it might be that the weakness point and need a simple strategy and creative sense and artistic intuition involving artist or designers. Swart, as an example, suggested in The Philosophical Implications of the Four-Colour Theorem that there is many ways to proofs prove. Which seems logical and easy to understand to any level.

## CONCLUSIONS

Finally, an example of how such an extension could apply to the field of design. The example considered the developments beyond the 2-D plane to a 3-D surface by wrapping net to create the complete design of the dodecahedron. Mostly, just two colours are required within the whole shape, but a 3rd one is needed to counterchange between colours.



Three-colourable icosahedrons

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# Correlating twitter's mood with advertising campaign

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## ABSTRACT

Given the rise of the usage of social media in the recent years and how it impact politics, decision making, marketing and advertising in the Middle East, in addition to the recent upheavals of the advancement of computational intelligence makes social media a gold mine for analyzing people opinions, behaviors and correlating them with ground truth in real world.

## INTRODUCTION

The study how crowdsourcing people's opinions, emotions and moods on social media might influence the effectiveness and successfulness of digital marketing or advertising campaign. By employing machine learning and data analysis methods we want to answer the question: does people's moods stated on social media on a given time correlate positively with the success of social media advertising campaign?

## METHODS

Data analysis will employed technique on a data streamed between 4 weeks time window, we used twitter streaming API to collect the data within the given time window. While collecting the data within the same time window we started an online advertising campaign on the same geological area as well. Next stage was to use a psychological dictionary or an emotions lexicons a collection of words indexed with emotions dimensions. The dimensions represents (anger, disgust, fear, joy, sadness, surprise) which considered the 6 basic human emotions. The last step is to analyze which of these emotions does correlate linearly with the success or failure of the advertising campaign. The emotion lexicon represents an extension of WordNet emotion lexicons PhD work of [Saad, 2015]. Each entry (synset) in this lexicon is annotated with one of six emotions (anger, disgust, fear, joy, sadness, and surprise), which are considered as the basic human emotions according to the psychological study conducted in [Ekman, 1992]. For the analysis we used Pearson correlation coefficient, Pearson Product-Moment Correlation Coefficient (PPMCC), is a measure of the linear correlation between two variables X and Y. It has a value between +1 and -1, where 1 is total positive linear correlation, 0 is no linear correlation, and -1 is total negative linear correlation.

## Expected Results

After employing a simple correlation study on the data collected, more specifically we are aiming to correlate the appearance of the words indexed as represents the 6 basic human emotions in Arabic with the success or failure of the advertising campaign. We define the success of advertising campaign by tracking the performance of the campaign using twitter's performance tracker, more specifically there are 3 factors that determines the success of the campaign by twitter platform as following:

Impressions: This is how many times your ads have been seen by Twitter users.

Results: These are the actions that are tied to your objectives. For example, if your goal is website visits, the results tracked will be link clicks.

engagement rate This is the number of impressions for your ads divided by the number of results.

Given the above definitions of the campaign's success factors we now correlate them with the "word count" of the tweets that appeared in the same time window. Below table represents correlation coefficients of the 6 basic emotions with the advertising campaign:

Emotions	Correlation	Word Count
Anger	0.0032	44987
Disgust	0.1012	23324
Fear	0.0123	33287
Joy	0.0011	67234
Sadness	0.0001	21983
Surprise	0.0567	10923

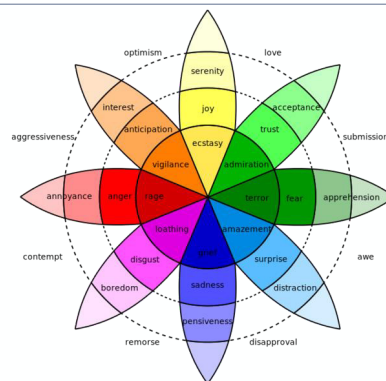


Chart 1: Representation of the six basic human emotions and how they are extended  
Melissa Donaldson , 2017, Plutchik's Wheel of Emotions

## SUMMARY

After employing a simple correlation study on the data collected, more specifically we are aiming to correlate the appearance of the words indexed as represents the 6 basic human emotions in Arabic with the success or failure of the advertising campaign. We define the success of advertising campaign by tracking the performance of the campaign using twitter's performance tracker

## CONCLUSIONS

The correlation coefficient of the 6 basic emotions, as shown in the table above , do not correlate with the appearance of the word count of the 6 basic human emotions, our simple correlation study is basic and limited to linear correlation, we are aiming to collect more data and employ more advanced analysis technique. In addition we are planning to extend the time window of the data collection and run different advertising campaigns. Summarizing we ran an advertising campaigns with specific time window and region, data of twitter users are collected within the same time window and region, an aggregation analysis is applied on the data by counting the word that indexed as a reflection on the six basic human emotions. A correlation study is applied to correlate between aggregation analysis and the success of the advertising campaign.

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**POSTER BOOKLET**





# Interactive Speaking Activities for EFL Classrooms

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## ABSTRACT

This research discusses how to develop speaking English properly in an EFL classroom by using a number of methods to further enhance the students' dialogue. These methods vary from triggering spontaneous responses to thoughtful conversations. They will also equip the speaker with proper ways to make him/her prepare to start a conversation anywhere, anytime. Therefore, applying those methods will result in enriching students' learning experience.

## INTRODUCTION

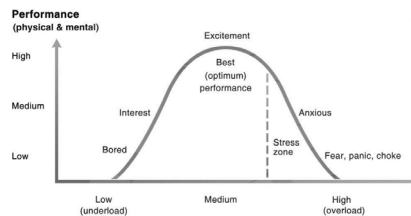
Why is it easier for students to apply the grammar in their writing more than their speaking? Whenever students are taught a new grammar lesson, they start practicing, so they apply it in their writings. As soon as they perfect applying that new grammar rule in their writings, teachers notice that they haven't applied it in their speech as well. What good speaking activities deliver the desired outcome in the classroom?

## METHODS

1. A jar is given, and the students choose random topics and write them down. They put the notes in the jar, and they have to talk about the note they draw spontaneously.
2. *The Big U* is an activity like the previous one, but the speaker has to be in the center of the class while the tables are facing him/her.
3. *Say It, but Don't Really Say It* is a game that is inspired from a famous Arabic card game, its main rule is to make the class guess a specific word by explaining it as much as possible, but without using a list of prohibited words.
4. *Who Am I?* is also a guessing game in which a speaker is given a description of a famous person that they have to portray, and the rest of the class has to ask the speaker questions until they discover the identity of the famous character.
5. *Guess The Dialogue* is a muted video played while the students have to guess the dialogue that is spoken based on the characters facial expressions as well as the place.
6. The students use their intonation in the *Tone It Up /Down* activity. Adjectives will be written, and when the teacher points at a certain one, the student has to change her/his intonation to match the adjective.
7. In *The Walkthrough Gallery* students draw artistically then put their drawings on the wall. When all drawings are up on the wall; the students take turns walking through critiquing all of the drawings using as many adjectives and vocabulary.

## RESULTS

1. The result for the first two methods is for students to practice their spontaneous speech, so they are always ready to start talking at any given time.
2. *Say It, But Don't Really Say It* will enable students to use a different variety of vocabulary, so they don't stick to words which they are most comfortable with and tend to repeat frequently.
3. *Who Am I?* will allow the class to practice asking questions according to the lesson that is given by the teacher. That way they will not just learn to write the questions; but also say them properly.
4. *Guess The Dialogue* will help the students practice forming a dialogue based on the background of the video they are watching and the characters' expressions.
5. *Tone It Up/Down* is a fun phonetic exercise that will help students adjust their intonation to convey meaning.
6. *The Walkthrough Gallery* gives students the platform to freely voice their opinions about the drawings they see.



Yerkes-Dodson Law



STUNER Technique

- Specific- to the point
- Timely- not delayed
- Understandable- easy to understand
- Nonthreatening- encourages application
- Revisable- creates actionable steps

## SUMMARY

To sum up, these technique work because the teacher models the proper flow of the speaking activities first; students observe then emulate. Any false execution will result in teacher constructive feedback. Moreover, learning to observe the teacher helps cut the learning curve and reduces time.

## CONCLUSIONS

In the end, the methods are effective because they have been tested, and they are also enjoyable. Furthermore, using these games for educational purposes gives the learner content in a relaxed familiar atmosphere, so they become comfortable with their speech. They also balance the students' attention as well as stimulation or level of excitement. Previous research proves that learning happens better when it incorporates excitement.

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# Teaching Vocabulary Through Drawings and Storytelling

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## ABSTRACT

It has long been claimed that stories and art are influential tools for language learning. This research presents the results of a study using drawings and storytelling to teach vocabulary. It was executed by having students listen to a story, match the vocabulary words to the appropriate image, and draw up their own storylines. The results found that students were able to remember the vocabulary words better, as well as benefit on an overall level.

## INTRODUCTION

Since the beginning of time, human communication and the transfer of information took the form of drawing on rocks and stone. When words were introduced later on, storytelling emerged as a new and more expressive form of engraving the lives of many in the shape of letters that played in the mind and resonated for years and years. This research assists language instructors in joining these two timeless techniques of learning into one effective vocabulary teaching method.

## METHODS

### The instructor must prepare the flowing items before class:

- Large images in a story sequence that illustrate the vocabulary words. (the images should be drawn up to encourage the students to draw themselves)
- The vocabulary words that need to be taught in class cut up into strips with different colors to represent different groups.
- A short story that uses the vocabulary words in context.
- A3 papers, tape and colors.

### In class, the instructor should follow the steps below to insure the smooth flow of tasks:

1. The instructor puts up the images on the walls of the classroom.
2. She/ he should then divide the class into groups based on colors and distribute the vocabulary strips.
3. Next, the instructor reads the prepared story slowly using intonation while stressing on the vocabulary words as well as pointing to the images that represent them. (read the story twice)
4. Finally, the instructor gives the students three minutes to walk up to the images and stick the vocabulary words next to the appropriate picture that represents it.

### To insure that students understood the vocabulary words that were taught, the instructor would give the following exercise:

1. The instructor hands each group an A3 paper with colors and asks them to do the following within a ten minute time frame:
- Ask the students to draw up a story line using three to four of the vocabulary words.
- After they have finished, the instructor asks them to read their stories and share their drawing with the class.

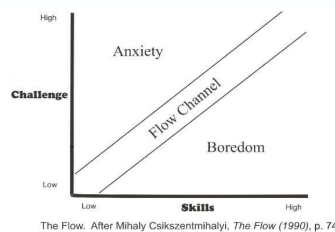
## RESULTS

### Brain Functions:

1. Using drawings and storytelling to teach vocabulary aids in improving memory by stringing together ideas and images into story chains and thus making them visible and tangible.
2. In addition, both methods foster the three styles of learning auditory (storytelling), visual (drawings), and kinesthetic (peg vocabulary on images, write up stories, and draw pictures).
3. These techniques help in the development of the brain by using the right hemisphere which is in charge of creativity and is often neglected in many lessons.
4. Storytelling aids students in improving their listening and speaking skills.
5. Both techniques support communication skills as art helps in expressing ones inner feelings through visuals while storytelling transfers inner thoughts and feelings into spoken words.

### Emotional Repair:

1. Because the life of a student is filled with challenges and pressures, these techniques help in stress relief and get students to operate from a flow state.
2. They also increase more positive emotions.
3. They improve emotional intelligence.
4. Drawing helps students become more aware of details as storytelling makes them aware of their culture and roots.



### The Flow Model

With this "Storytelling" technique; students are able to produce the vocabulary words with the right mixture of challenge and skill; placing them in a "flow" state. Challenge vs. skill is subjective as students' drawing abilities vary.

## SUMMARY

Drawing and storytelling have been used for centuries to communicate and convey information. In the classroom, they are powerful tools that educators can use to teach vocabulary amongst other skills.

These methods are suitable for all learning styles because they aid in helping students to visualize and create storylines.

The results of their benefits go beyond learning for education and affect the students in a more influential and personal way.

## CONCLUSIONS

To conclude, using drawings and storytelling has proven to be a powerful technique in teaching vocabulary. This is due to fact of how they touch base on the different styles of learning as well as their massive benefits to the individual student in the class and beyond.

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