Asia Pacific Journal of Information Systems
Vol. 25 No. 2 (JUNE 2015), 337-355

ISSN 2288-5404 (Print) / ISSN 2288-6818 (Online)
http://dx.doi.org/10.14329/apjis.2015.25.2.337

# New Trends and Challenges of Internet Marketing

Anthony Nosshi[a,*], Aziza Saad[b], M. B. Senousy[c]

[a] *Ph.D. student, Computer and Information System dept. Sadat Academy. Egypt*
[b] *Professor, Computers and Information Faculty, Mansoura University, Egypt*
[c] *Professor, Computer and Information System dept. Sadat Academy. Egypt*

**ABSTRACT**

The Internet has become one of the most important channels for people to communicate and for companies to implement their sales promotion activities, such as advertising. Marketing and advertising attempt to influence customers' attitude to persuade them to choose to buy the advertisers' products instead of the competitors'. With the different forms of online marketing, such as search engine marketing, email marketing, and mobile marketing, advertisers can find more effective strategies to attract the attention of more targeted audiences. With the emergence of the social web (web 2.0), a new platform was introduced called social networks. This paper presents the current work in internet marketing activities until web 2.0, and conducts a social network analysis to aid in data extraction. Marketing and advertising companies have understood the power of information for a very long time. The more knowledge these companies have on the demographics, consumer habits, and preferences of particular customer types, the more they can tailor their product offerings, and the more sales they can make. This paper aims to understand the internet marketing concepts as well as present challenges and work directions in internet marketing.

*Keywords:* Internet Marketing, Web Analytics, Social Media Marketing, Social Media Analysis, Web 2.0

## Ⅰ. Introduction

When Internet business applications appeared on the 90s, they caused a significant impact on the economy. Industries intend to manage their processes to fit consumer needs; this flexibility imposes a new dynamic to the economy (Oliveira et al., 2011).

With the explosion of Internet users, Internet has been considered as the new channel for companies implementing their sales promotion activities. Thus, Internet could be considered as an interactive communication medium which deliver up-to-date product/service information to consumers (Huang et al., 2013).

Since the Internet has become one of the primary message delivering medium, it is worthwhile to investigate in internet marketing activities and to find out the work directions that require more research to enhance internet marketing activities and to optimize the profit of organizations which adopt internet

*Corresponding Author. E-mail: Anthony.Nosshi@gmail.com Tel: 201227282136

marketing activities. This paper tries to answer the question of what the major challenges that faces the internet marketing activities are, and which work directions can be investigated more for further research.

The remainder of this paper is organized as follows. Section II describes the internet advertising and its goals, and showing up the different forms of online marketing. This section also contains how to measure the advertising effectiveness using web analytics. Section III describes internet marketing activities in web 2.0 environment. Section IV discusses the social networking platform and how to analyze it. This section also shows how advertising is done using social networks. Section V discusses the challenges and work directions in internet marketing.

## Ⅱ. Internet Advertising

Advertising refers to non-personal communication activities for the presentation or promotion of ideas, goods, or services that are paid by an advertiser who can be identified as sponsor. In general, the primary goal of advertising is to change or influence future customers' attitudes to persuade them to buy the advertisers' rather than the competitors' products. Online or digital marketing pertains to achieving marketing objectives over the Internet (Klapdor, 2013).

Online advertising began like any television advertisement, where the goal was for the advertisement to be viewed by as many people as possible without caring to whom the advertisement was for. Many online advertisements were placed in popular websites in order to make sure the advertisement was viewed as much as possible. However, with the rapid growth of online content in the last decade, advertisers became more aware that demographic information would allow more targeted approach in the advertisement. As database-mining techniques become more and more sophisticated, advertisers find more effective strategies in order to attract the attention of more targeted audiences as opposed to the basic targeting techniques, such as time, frequency, demography, etc. Today, with the prevalence of Internet access and the amount of time consumers spend online, advertisers have moved away from mass marketing programs and are more focused on targeted and personalized marketing (Angelia et al., 2013).

In order to optimize the profit of internet marketing, it is necessary to understand the current internet marketing activities that companies and advertisers are performing. For this purpose, it is essential to know the current forms or channels that online marketing takes for advertising purposes.

### 2.1. Forms (Channels) of Online Marketing:

Klapdor (2013) gives an overview of different Internet forms as in <Figure 1>. These forms in brief are as follows.

#### 2.1.1. Search Engine Marketing

Search engine marketing (SEM) is an activity that promotes a firm through search engines by delivering relevant content in the search listings for searchers and encouraging them to click through to a destination site. It can be separated into two major techniques: SEA, which is often referred to as pay-per-click (PPC), sponsored search, or paid search, and search engine optimization (SEO), or organic search results. Firms use SEO to increase the position of their listings in the natural or organic search results which are

generated by the search engine's proprietary raking algorithms. Because SEM is a pull channel, it is more often used for sales than for branding objectives.

#### 2.1.2. Display

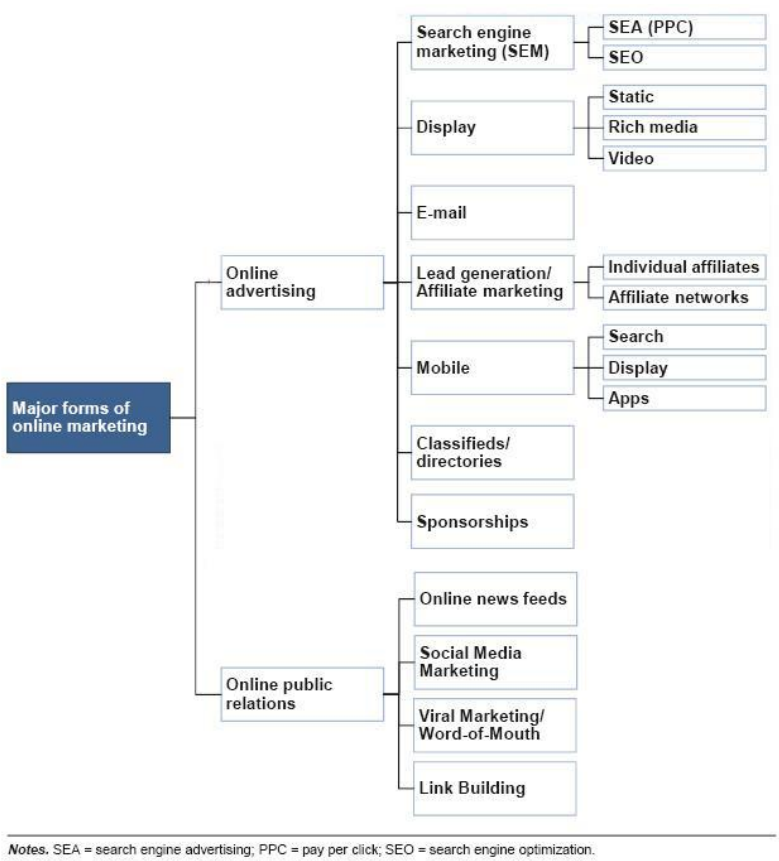
Display ads are paid ad placements using graphical or rich media ad units within a web page to achieve goals of delivering brand awareness, familiarity, favorability and purchase intent. Many ads encourage interaction through prompting the viewer to interact or rollover to play videos, complete an online form or to view more details by clicking through to a site.

#### 2.1.3. E-mail

Outbound e-mail marketing is the activity in which advertisers send e-mails to existing customers or prospects that contain a link to their website. Messages sent without permission are often referred to as spam or junk e-mail.

#### 2.1.4. Lead Generation (Affiliate Marketing)

Affiliate marketing is the ultimate form of marketing communications because of its performance-based pricing model. The advertiser only pays the referring sites (also called "affiliates" or "publishers") for transactions




<Figure 1> Overview of the Different Forms of Online Marketing (Klapdor, 2013)

(sales) or qualified purchase inquiries (leads), and thus wastage is significantly smaller than with other communication media. Multiple types of affiliates exist, including aggregators (websites that offer price comparisons for a large number of products and services), review sites, blogs, and others. When a consumer comes from one of these affiliated websites to the advertiser's shop and converts, the affiliate is reimbursed.

#### 2.1.5. Mobile

Mobile advertising is tailored to and delivered through wireless mobile devices, such as smart phones (e.g., BlackBerry, iPhone, Android) and media tablets. It can comprise the previously described forms of search and display ads, appear in mobile applications (apps), or use text messaging services (SMS, MMS).

#### 2.1.6. Classifieds and Directories

When firms or consumers pay third-party websites to list specific information (e.g., company profiles, job offerings, used-car ads), this type of advertising belongs to the category of classifieds and directories.

#### 2.1.7. Sponsorships

Online sponsorships refers to the linking of a brand with related content or context for the purpose of creating brand awareness and strengthening brand appeal in a form that is clearly distinguishable from a banner, button, or other standardized ad unit.

#### 2.1.8. Online PR

Online PR comprises a broad spectrum of activities, including distribution of press releases over online news feeds, link building with other websites, social media marketing (e.g., blogging, presence on social networks, social bookmarking), and creating buzz with viral marketing campaigns as follows.

a. Online news feeds

Web feeds are structured documents used to transfer frequently updated digital content to the users. Web feeds are mostly known by the name RSS feeds, since RSS is one of the most widely used formats for feed representation and delivery. Besides RSS, the other popular format for web feed representation is Atom, based on XML language (Vladimir et al., 2013).

b. Social media marketing

Social media marketing (SMM) can be defined as an interaction with a set of online social media conversations from marketing perspective, based on converged media (since conversations can span both technologies and the media) (Yang et al., 2011)

c. Viral marketing

Viral marketing employs to promote products by targeting a certain number of most influential members in network, and it has developed into an effective marketing strategy recently (Li et al., 2013).

d. Link building

Link building refers to the process of building quality, relevant links to a website, which in turn helps the site achieve higher ranking in search results and drive traffic to the site (Zhang., 2012).

### 2.2. Measuring Advertising Effectiveness With Web Analytics

According to Burby et al. (2008), the term web

analytics refers to "the measurement, collection, analysis and reporting of Internet data for the purposes of understanding and optimizing Web usage. With accountability comes measurement, which in turn creates the need for metrics. In order for metrics to be effective, they must be based on a common set of terms, definitions, and practices" (Burby et al., 2008).

Web analytics deals with the methods for measurement, data collection, data analysis and providing the related feedback on internet for the motive of understanding behavior of the customer using a website. The benefit of studying behavior of the customer leads to optimize the usage of web site (Kumar et al., 2012).

Web analytics is the science and the art of improving websites to increase their profitability by improving the customer's website experience. It is a science because it uses statistics, data mining techniques, and a methodological process. It is an art because, like a brilliant painter, the analyst or marketer has to draw from a diverse pallet of colors (data sources) to find the perfect mix that will yield actionable insights (Waisberg et al., 2009).

Traditionally, web analytics has focused on analysis and reporting of business metrics of interest to marketers, such as page views and revenue, by various dimensions of session characteristics that can be obtained from user request (Pai et al., 2013).

Much of the use of web analytics tools has been in the realm of online marketing. Web analytics has fueled growth in online marketing because it allows marketers to measure the effectiveness of their work, through such metrics as the number of people who reach their website and go on to buy something—data that can be compared to the amount of money spent to acquire those visitors (Beasley, 2013).

### 2.3. Previous Work of "Online Advertising":

Many researches have been conducted in this area. In order to find out some of the several challenges facing the online advertising, it is necessary to consider what some other researchers have done and see their progress in this particular research area.

- David et al. (2013) have shown a particle filter that can be used for estimating other agents' bids given a periodic ranking of their bids. The particle filter is used for estimating bids of other advertisers. Since the information revealed about competing advertisers is limited, they have shown how such models can learn from the past bidding data.
- Cigler (2009) has described several bidding strategies (Return-on-investment (ROI), Knapsack ROI, Balanced Best-response, online Knapsack) and evaluated their performance empirically. The best performing strategies were ROI and Balanced Best response. Furthermore, Cigler (2009) presented a new profit maximizing strategy for multiple keyword ad campaigns that takes into account the budged constraint and has shown to be successful particularly for small budgets.
- Angelia et al. (2013) were able to establish an in-depth understanding of online advertising by collecting and analyzing numerous data on online advertising with the hope that it could serve as a basis for further study on the field. They have also examined the security and privacy concerns of online advertising and the various gimmicks used to victimize innocent people. They have also explained the attractiveness of free online advertising services and the mechanism though which website owners profit from

hosting online advertisements, despite the fact that neither advertisers nor users pay for the services.

- Wang et al. (2014) argued that when there are both explicit visual and explicit verbal messages which describe the product features in one advertisement, consumers' perceptions are likely to be dominated by the visual message.
- Singh et al. (2000) proposed the "picture superiority effect" to elaborate the concept that consumers tend to have superior memory or recalls toward pictures over words. In support, Paivio and Yarmey (1966) asserted that pictures are more easily to be remembered spontaneously than words. This may be due to the multiple retrieval routes created by the pictures which will later transformed to the greater number of memory codes. Petty and Cacioppo (1986) have proposed that the low elaboration was more likely linked to imagery (e.g., pictures) processing whilst the high elaboration was more relevant to discursive (e.g., symbolic, language-like) processing.
- Ilfeld and Winer (2002) used site level data to analyze how to optimize advertising spending. Sherman and Deighton (2001) also used site-level data to study how to optimize placement of ads. Despite the dominance of banner ads in online advertising in the early stage, they often generate low click-through rate, sometimes called "banner blindness." Danaher and Mullarkey (2003) found that goal-oriented web users are less likely to recall banner ads than web surfers. Cho and Choen (2004) also provided explanations of why people avoid banner advertising. Moreover, using empirical data, they investigated the association between the observed history of visits with clicks and conversion. Moe and Fader (2004) developed an individual-level probability model to incorporate different forms of customer heterogeneity and studied the impact of visit effects and purchasing effects on conversion. They found that both effects contribute to conversion. Similarly, Chatterjee et al., (2003) examined how click- through rates are influenced by banner ads exposure. Manchanda et al. (2006) further studied the effect of banner advertising on actual purchasing patterns. Their findings suggested that the number of exposure, number of Web sites, and number of pages all positively influence repeat purchase probabilities.

## Ⅲ. The Evolution of Internet Marketing

Within the emergence of social web (web 2.0), social networks become more crowded and their rapidly growth caused scientists to search for methods analyzing the data which is implicated in social networks. Social network analysis with special attention to Social Networks' graph is a method that helps data extraction. These data could be used in targeted advertisements which could impress users more. In the field of e-advertisements, presenting advertisements and sales are combined together using hypertexts or hypermedia to the nearest retailer or e-shops. So, targeted advertisement could be mentioned as an effective solution in the field of marketing on the web. Scientists have focused on various variables and feature that could be considered by target users in an appropriate way (Kardan et al., 2013).

Marketing and advertising companies have understood the power of information for a very long time. The more they know about demographics, consumer

habits, and preferences of particular customer types, the more they can tailor their product offerings, and as a result, the more sales they can make. Technology also has a say in the field of reputation preservation. For example, the notion of social shopping is gaining grounds in today's purchasing processes. People give their opinions on products and companies on social networks, blogs and forums and uncontrollable information is circulating on the Internet. Many online shoppers buy products from businesses they have knowledge of, and are converted into customers because they heard about a brand from another person. This is why companies need to put effort into making word of mouth as positive as possible (Fonseca et al., 2013).

## Ⅳ. Social Networking

Social Network Sites (SNSs) constitute an efficient and effective platform to spread information, and can thus be seen as an alternative to traditional media. However, in SNSs, information flows are governed by different rules because every user can (consciously or unconsciously) decide to facilitate information spreading (Magnani et al., 2013).

Analyzing social networks and micro-blogging websites, such as Facebook Google+, Myspace, LinkedIn, Twitter and Tumblr, can offer even better insights than monitoring online searches, as one could correlate information coming from particular individuals (whether it is opinions or facts) in the light of what else could be known about these individuals from their social networking profile (e.g., how often they travel, what kind of online groups or causes they embrace, what movies they like, who else is in their network, etc.) (Fonseca et al., 2013).

Huge numbers of social network user's attract marketers to these environments for advertisement. The main target of analysis is to find a group of people that have similar properties, such as geographical location, events and friends. Finding an advertising area is an important issue (Zadeh et al., 2008).

### 4.1. Social Network Analysis

A social network is a set of actors (points, nodes, or agents) that may have relationships (links, arcs, edges, or ties) with one another. It may have few or many actors, and one or more kinds of relationship between pairs of actors. In social networks, each actor represents a person or social group, and each link represents the presence or strength of a relationship between two actors. Nodes can be used to represent larger social units (groups, families or organizations), objects (airports, servers, or locations) or abstract entities (concepts, texts, tasks or random variables), (Fonseca et al., 2013).

### 4.2. Method of Analyzing Social Networks

The basic method of analyzing social networks is to map the activity of networks to a graph as G (V, E) that V is a set of node, which each node is an entity in the network, and E is a set of edge that shows the link between entities. With this graph, network can be monitored and traced.

There are many different models for creating that graph. Some of them monitor the state of the network, based on time, location or both of them. However, depending to application, making and monitoring, the network may be different, but after creating a graph, some properties is useful for all type of models, such as:

- Degree: number of ties for an actor.

- Betweenness: lying between each other pairs of actors.
- Closeness: length of paths to other actors.

These properties are useful for computing the intensity of relation between entities. Another goal of social network analysis is to model the actors' relationship and explain the observed network in a predictable manner. In addition, identification of subgroup is an important area in social network analysis (Zadeh et al., 2008).

## 4.3. Advertising Using Social Networks:

The first step for targeted advertising is using web mining and multimedia techniques, which are updated methods based on data mining. Data mining is the process of analyzing data from different perspectives and summarizing it into useful information and multimedia mining does the same to multimedia data. Data mining, web mining and multimedia mining are the main bases for recommender systems (Kardan et al., 2013).

The major mining methods used for marketing and advertising are as follows (Kardan et al., 2013).

### 4.3.1. Data Mining

The simplest methods to process data and analyze them are data mining. Data mining techniques are not as useful, as they were before because data, which is on the web, is different from textual data and lots of new data types are available that data mining cannot analyze them as well.

### 4.3.2. Web Mining

Web mining is very similar to data mining but it discovers pattern from the web; in other words, it is a mining method that is dedicated to web. It is the base of targeted advertisement. According to analysis targets, web mining can be divided into three different types, which are web usage mining, web content mining, and web structure mining. Social networks data, which include the huge amount of multimedia, need to be searched and discovered with more precise approach, like multimedia mining.

### 4.3.3. Multimedia Mining

With the existence and grows of social networks, web contain more multimedia than any other data type. Web mining was not enough to extract data from social networks as it was just proper for web 1.0 environment. But, web 2.0 with user generated content and rowing multimedia content needs new methods for discovering data.

## 4.4. Previous Work of "Social Networking Analysis"

For the purpose of exploring some of challenges facing the social network analysis, it is essentially needed to explore some of what the previous researchers have progressed in this area.

- Kristyan et al. (2013) studied the way of optimizing behavior targeted online advertising that aims at adjusting display ads with habits of web users.
- Backstrom et al. (2014) investigated how to identify important people - those linked by strong social ties within an individual's network neighborhood for a particular category of strong ties and those involving spouses or romantic partners. They organized their analysis around

a basic question: given all the connections among a person's friends, can you recognize his or her romantic partner from the network structure alone? Using data from a large sample of Facebook users, they found that this task can be accomplished with high accuracy, but doing so required the development of a new measure of tie strength that they termed it 'dispersion' - the extent to which two people's mutual friends are not themselves well-connected.

- Ngonmang et al. (2013) claim that monetization of a social network platform comes not only from efficient advertising features but also from all features which would contribute in increasing the audience. They have focused on 3 monetization axes: community management, personalized advertising, and recommendation. They proposed for each of these axes several features that can implement using social network analysis. These features were tested on the data of a real French social blog platform Skyrock.com, the second largest social network in France.
- Li et al. (2013) have developed a diffusing path planning mechanism for advertisement for supporting influencers to propagate marketing information and supporting marketers to evaluate possible reward under different marketing strategies.
- Huang et al. (2013) proposed a dynamic diversity-dependent algorithm for detecting the influencers by evaluating the influence of users throughout social networks. Comparative analyses with the existing methods on either synthetic social networks or real Twitter data show that their strategy performs best. It implies that the pattern of the influence propagation should be updated dynamically to reflect the flow of influence spread to better capture the rapidly changing dynamics of microblogs. Their proposed scheme is therefore practical and feasible to be deployed in the real world.
- Yang et al. (2013) analyzed influence maximization for noncooperative social networks under the Independent Cascade Model. They proposed a model of non-cooperative nodes and proved some interesting properties of this model. Based on this, they further developed a game-theoretic model to characterize the behavior of non-cooperative nodes, and designed a Vickrey-Clarke-Groves-like scheme to incentivise cooperation. An advertiser can resolve the negative effect of non-cooperation with their proposed solution. Evaluation on large social networks demonstrates the importance of cooperation and the effectiveness of their proposed incentive scheme in maximizing influence. They also discussed the budget allocation between seed nodes activation and incentives to non-seed nodes.
- Kaptein et al. (2013) mentioned that advertisers on social network sites often use recommendations by others in a user's networks to endorse products. While these familiar others are hypothesized to be more effective in influencing users than unfamiliar others, there is a catch: familiarity does not necessarily ensure similarity to the familiar person, a potential problem because the combination of familiarity and dissimilarity has been hypothesized to lead to lowered compliance. They tested people's compliance to similar and dissimilar familiar others in an online environment: they showed that in both cases, familiarity leads to increased compliance. The work highlights the importance of familiarity on influence and suggests that gaining familiarity even in situations of

dissimilarity is effective.

- Al Ayyat et al. (2014) studied how to leverage explicit interest, gathered from a user's social profile, and integrate it with social-based opportunistic forwarding algorithms in order to enable soft realtime opportunistic ad delivery in intermittently connected mobile networks. They proposed IPeR, a fully distributed interest-aware forwarding algorithm that integrates with PeopleRank to reduce the overall cost and delay while reducing the number of contacted uninterested candidates.

### 4.5. Advertising Recommender System:

A recommender system is a way in which knowledge can be represented. Recommender systems are useful alternatives to information filtering algorithms, as they provide users with effective tools to discover desired items that they might not have found by themselves. The systems predict the potential items from available products or services based on users' requirements and preferences (Dao et al., 2012).

Traditionally, recommender systems have focused on recommending the most relevant items to users. While the traditional recommendation technologies have performed reasonably well in several applications, it may not be sufficient to consider only users and items – it is also important to incorporate contextual information in the recommendation process in many other applications, such as location and time-based services, including travel recommendations (Dao et al., 2012).

### 4.6. Previous Work of "Social Network Advertising"

Social network advertising has been investigated by many researchers. The researches have solved some problems, and many others are still challenging. To be able to explore the challenges, it is necessary to explore the progress of some of previous researches in this area.

- Kardan et al. (2013) proposed a framework to facilitate targeted advertisements in social networks' platform; using social network information, previous advertisements and their status to have more precise information for recommender systems. Recommender system is used as a tool to target each user according to its preferences and interests. The main goal is to show the most effective advertisements in sidebar and attract users to share word of mouth (WOM) advertisements with each other. Considering user's type through their activity in a social network and omitting repetitive advertisements ease our aim.
- Lo et al. (2012) proposed a location-time based ethnic group advertising recommendation system (LTRS), which considers that in reality there are cases when only very little known information is available to calculate the population habits and memberships. Through time and location properties to identify the ethnic group, an advertising system can appropriately determines and provides valuable reference information in all kinds of environments.
- Chou et al. (2011) proposes a helping-user identification algorithm for broadcasting multimedia information in a human centric communication networks (HCCN). Their paper considers an advertiser who adopts the word-of mouth marketing technique to find some helping-users for disseminating the multimedia information. It was shown that customer referral programs,

a form of word-of-mouth marketing, are indeed a financially attractive way for firms to acquire new customers. In word- of-mouth marketing, the advertiser normally rewards each helping-user based on the potential number of users that he/she can attract.

- Dao et al. (2012) propose a new recommendation model, and termed it Context-Aware Collaborative Filtering using genetic algorithm (CACF-GA), for location-based advertising (LBA) based on both user's preferences and interaction's context. They first defined discrete contexts, and then applied the concept of "context similarity" to conventional CF to create the context-aware recommendation model. The context similarity between two contexts is designed to be optimized using GA. We collect real-world data from mobile users, build a LBA recommendation model using CACF-GA, and then perform an empirical test to validate the usefulness of CACF-GA. Experiments show our proposed model provides the most accurate prediction results compared to comparative ones.
- Namiot et al. (2011) described a model for advertising in the social networks. Their approach introduced a generic mobile service that lets any business publish customized records (statuses) in social networks in exchange for some benefits (discounts, gifts, coupons) provided for the customers. For the business, this service introduced a way for advertising in the social networks. For the consumers, this service introduced a way for exchanging access to the own social graph for some benefits.
- Chang et al. (2012) investigated the impact of three critical factors on advertising effectiveness in SNS: tie strength, endorser expertise, and product type. Using a $2 \times 2 \times 2$ experimental design, they found interaction effects among these factors.
- Siri et al. (2013) proposed the use of an analysis model in order to measure information flows across social networks. They claimed that many factors affect the performance of information flows across social networks, as they depend, not only on the number of communications required to reach the target audience, but also on the individual and social parameters used by the target audience, such as the number of friends who may be interested in the target product and their preferences. This study showed the importance of those parameters affecting customer product awareness.

## Ⅴ. Challenges and Work Directions

The field of internet marketing has been investigated by many researchers. They have investigated many challenges. In the lights of our readings during our investigation in internet marketing, we have noticed that there are still many challenges that need to be investigated more by researchers. Researches were chosen between the years 2012 and 2014. We have classified those challenges up to 8 major categories as follows: audience targeting, spatio-temporal aspects, budget optimization, social network analysis, customers' opinion, security and privacy, spam connections, and adoption of cell phones, as shown in <Figure 2>.

### 5.1. Audience Targeting

Advertisers are concerned about the efficiency of their online advertising campaigns and consequently, would like to restrict their ad impressions to certain

groups of audience. These restrictions, known as targeting criteria, limit the reachability for better performance (Jalali et al., 2013).

Targeted advertisement could be mentioned as an effective solution in the field of marketing on the web. Scientists have been focused on various variables and features that could be considered to target users in an appropriate way (Kardan et al., 2013).

### 5.2. Spatio-Temporal Aspects

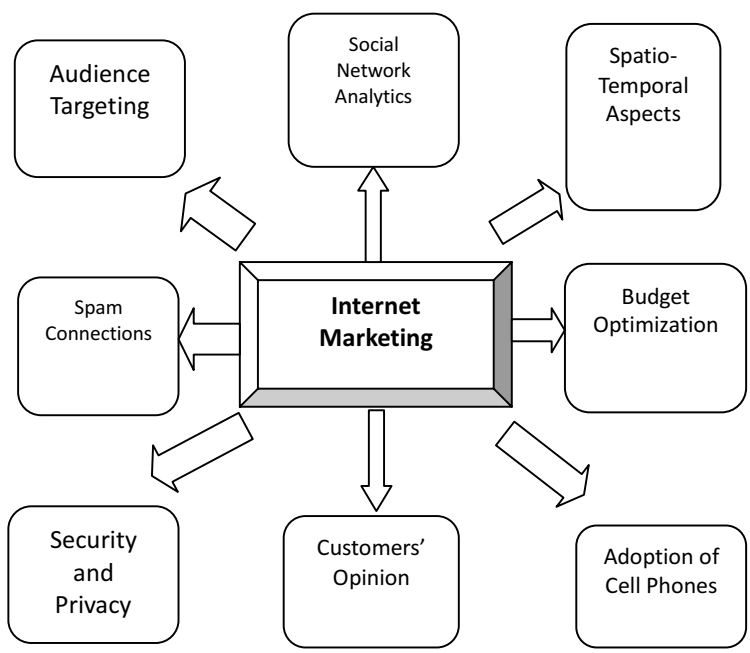
Spatio-temporal attributes represent two aspects of physical presence - space and time - which are integral to human activities. Space-time markers of an entity in conjunction with correlation with other networks, such as movements in social network, encodes a wealth of provenance information (Lee et al., 2013).

An important aspect of social networks is that they are geographically embedded, a fact that affects and is affected by the structure of the network. The exact mechanisms of this interplay between social structure and the geographical characteristics of its units have been addressed from different points of view However, the lack of empirical data has been a limiting factor for the validation of any attempt to describe or explain this relationship (Moyanoet al., 2012).

### 5.3. Budget Optimization

A quality budget optimization strategy can significantly improve the effectiveness of advertising campaigns, thus helping advertisers to succeed in the fierce competition of online marketing (Yang et al., 2012).

How to rationally allocate the limited advertising budget is a critical issue in sponsored search auctions.




<Figure 2> Challenges and Work Directions

There are plenty of uncertainties in the mapping from the budget into the advertising performance. Uncertainties of random factors at the campaign level lead to risk at the market/system level (Yang et al., 2013).

### 5.4. Social Network Analytics

Social network analysis can be used for implicit information retrieval, including the relationship between user interactions and friendships. The interaction between the user and friendship can be represented as a graph. So far, the analysis and implementation of social network analysis can be applied to obtain implicit information (Rachman1 et al., 2013).

Social network analysis is well positioned to enable analysts to better understand the composition and the mechanics of such culturally-different social networks. Social network analytics can help in revealing and understanding the networks composition, structures, characteristics, as well as connections with other social networks (Lecocq et al., 2013).

Advertising in today's market is no longer viewed as a matter of simply convincing a potential customer to buy the product but of convincing their social network to adopt a lifestyle choice. It is well known that social ties between users play an important role in dictating their behavior. One of the ways this can occur is through social influence where a behavior or idea can propagate between friends. By considering factors, such as homophily and possible unobserved confounding variables, it is possible to examine these behavior correlations in a social network statistically. The aim of viral marketing strategies is to leverage these behavior correlations to create information cascades in which a large number of customers imitate a much smaller set of informed people, who are initially convinced by targeting marketing schemes (Maghami et al., 2013).

Since users are often influenced by their friends, "word-of-mouth" exchanges, so-called viral marketing, in social networks can be used to increase product adoption or widely spread content over the network. The common perception of viral marketing about being cheap, easy, and massively effective makes it an ideal replacement of traditional advertising (Dinh et al., 2013).

### 5.5. Customers' Opinions

Though social networks provide limited number of characters for users around 140 characters, this short message involves much important information, such as the attitude to the present news, the opinion of new products, and the user's sentiment condition. Such information in Micro-blog is of great technical and social significance. To understand the attitude implied in the text, the study of sentiment analysis should be done. Text sentiment analysis computes people's emotions and attitudes in certain period of time or to some certain things, thus could help to detect depressed users, explore potential customers and business demands, and such on (Zhao et al., 2013).

Sentiment analysis is the field of study that analyzes people's opinions, sentiments, evaluations, appraisals, attitudes, and emotions towards entities, such as products, services, organizations, and individuals (Liu, 2012).

### 5.6. Security and Privacy

There exist a trade-off between productivity in advertising and invasion of user's privacy in the existing approaches. Due to these privacy concerns, there were many law suits filed against the Beacon advertis-

ing model used by Facebook resulting in its discontinuation. The new approaches need to address targeted audience while preserving the privacy in order to build appropriate revenue model for their operations (Ranjan et al., 2014).

Recent web sites collect personal information of users while storing logs of chosen items by the users on the sites, so that advertisements shown on browser will be related with favorites of users. Social networking service is one of the best systems for collecting personal information for commercial use. However, personal information sometimes includes information of privacy. The information collected on the sites might be used for personal identification or identifying specific ideology (Uda, 2013).

Internet targeted advertising is mostly based on user's personal information, such as profiling, Internet habits, history, etc., even if part of such information could be characterized as private. Thus, gathering and analyzing users' information might raise serious privacy concerns (Athanasiou et al., 2012).

### 5.7. Spam Connections

Many social networking service users reported that they had received unwanted friend requests, messages, or posts on their social or professional network profiles. While friend requests on their own seem innocuous enough, they are often just the first step towards whatever the spammer's intentions of malicious activities are, because they redirect users to phishing or malware sites or even just unsolicited advertisements (Park et al., 2013).

Spam or fraud connections in the networks may deteriorate the targeting performance. Thus, how to detect and expel malicious links shall be considered (Shang et al., 2013).

### 5.8. Adoption of Cell Phones

Cell phones have become one of the main sensors of human behavior due to their wide coverage and high penetration. As such, cell phone networks can capture both the social network of an individual and the spatial characteristics of that individual. The high penetration of cell phones implies that they can capture a large amount of spatio-temporal relationships at a scale not available to other pervasive infrastructures. This opens the door to characterize how the structure of a social network is related to the mobility of the individuals that defined those social interactions (Moyanoet al., 2012).

Analyzing the complete time dependence encoded in the timestamp associated to the phone call, in order to properly model the full set of dependencies between spatio-temporal characteristics and social network structure will help improve mobility prediction models, event detection algorithms, behavioral analysis of agents in urban/interurban environments, and related problems. Furthermore, applications to modeling of geographical influence of users, epidemic spreading analysis, among others, are also possible (Moyanoet al., 2012).

## Ⅵ. Conclusion

Since the emergence of internet business application on the 90s, its impact on economy has grown rapidly. With the growth of internet users, companies paid attention to internet as a new channel for implementing sales and promotion activities. Internet marketing and advertising, as a vital tool for any organization, has to be well used to achieve the goals of the organization. The online advertising started with the goal of being viewed by as many people

as possible. Advertisers then became more aware of the demographic information and tried to allow more targeted approach in the advertisement through the different forms of online marketing.

Measuring the effectiveness of the advertising activities with web analytics helps in determining either the marketing activities are effective or not. Web analytics were used to deal with the measurement, data collection and analysis for understanding the behavior of the customer using a website. Web analytics has helped the growth in online marketing through its ability to measure their marketing efforts effectiveness.

The advent of web 2.0 helped the improving of the marketing activities. Taking benefit of social networks and micro-blogging websites, they can offer even better insights than monitoring online searches, as one could correlate information coming from particular individuals (whether they are opinions or facts) in the light of what else could be known about these individuals from their social networking profile.

Analyzing social networks analysis through graphs that have nodes and edges lead to create some properties that are useful for all types of models like betweenness and closeness. They help in computing the intensity of relation between entities. Web mining is used to analyze data from different perspectives.

Further research should focus on the social influence and how it starts and propagate through the users of a social network. Also, further research should be done about the spatio-temporal aspects as people are using social networks in different spatio-temporal aspects, this all affect their decision and reaction towards any advertising campaigns they are exposed to. Further research also should be done for customers' opinions. They are of great importance for right targeting of the audiences. Their feedback is needed in evaluating the marketing efforts being done and to find people's interests for better targeting. Also further research should be made with the adoption of cell phones that people usually use either for calls or using social networking. Social network analytics can help to unveil many unclear aspects towards user targeting efficiently and economically.

## <References>


[1] Aïmeur, E., and Lafond, M. (2013). The Scourge of Internet Personal Data Collection. *Eighth International Conference on Availability, Reliability and Security (ARES), IEEE*, 821-828.

[2] Al Ayyat, S., Harras, K., and Aly, S. (2014). Social Pervasive Systems: The Harmonization Between Social Networking and Pervasive Systems. *Pervasive Computing and Communications Workshops (PERCOM Workshops), IEEE International Conference*, 178-180.

[3] Angelia, Pishva D. (2013). Online Advertising and its Security and Privacy Concerns. *15th International Conference ON Advanced Communication Technology (ICACT), IEEE,* 372-377.

[4] Athanasiou, A., Raftopoulos, C., Thanos, E., Kritharellis, G., Tselikas, N., Foukarakis, I., and Boucouvalas, A. (2012). Towards privacy-aware target advertising. *The 16th Panhellenic Conference on Informatics, IEEE,* 133-137.

[5] Backstrom, L., and Kleinberg, J. (2014). Romantic Partnerships and the Dispersion of Social Ties: A Network Analysis of Relationship Status on Facebook. *CSCW '14 Proceedings of the 17th ACM Conference on Computer Supported Cooperative Work & Social Computing*, 831-841.

[6] Beasley, M. (2013). Practical Web Analytics for User Experience. *Elsevier*, Chapter 1, 1-7.

[7] Burby, J., and Brown, A. (2008). Web Analytics Definition. *Web Analytics Association.*

[8] Chang, K., Chen, W., and Tan, B. (2012). Advertising Effectiveness in Social Networking Sites: Social Ties, Expertise, and Product Type. *TRANSACTIONS ON ENGINEERING MANAGEMENT, IEEE, 59*(4), 634-643.

[9] Chatterjee, P., Hoffman, D. L., and Novak, T. P. (2003). Modeling the Clickstream: Implications for Web-based Advertising Efforts. *Marketing Science, 22*(4), 520-541.

[10] Cho, C., and Cheon, J. (2004). Why Do People Avoid Advertising on the Internet? *Journal of Advertising, 33*(Winter), 89-97

[11] Chou, Y., Cheng, R., and Ku, P. (2011). Advertising in Human Centric Communication Networks. *The 7th International Wireless Communications and Mobile Computing Conference (IWCMC),* 1935-1939.

[12] Cigler, L. (2009). *Semester Project: Bidding Agent for Advertisement Auctions.* Ecole Polytechnique Federale de Lausanne.

[13] Dao, T., Jeong, S., and Ahn, H. (2012). A Novel Recommendation Model of Location-Based Advertising: Context-Aware Collaborative Filtering Using GA Approach. *Elsevier,* 39(3), 3731-3739.

[14] Danaher, P. J., and Mullarkey, G. W. (2003). Factors Affecting Online Advertising Recall: A Study of Students. *Journal of Advertising Research, 43*(3), 252-267.

[15] David, E., Robu V., Shehory, O., Stein, S., and Symeonidis A. (2013). Agent-Mediated Electronic Commerce. *Springer-Verlag Berlin Heidelberg,* 71-86.

[16] Dinh, T., Zhang, H., Nguyen, Dung, and Thai, M. (2013). Cost-Effective Viral Marketing for Time-Critical Campaigns in Large-Scale Social Networks. *IEEE/ACM TRANSACTIONS ON NETWORKING,* 2001-2011.

[17] Fonseca, J., and Xerez, R. (2013). The Influence of Technology on Social Network Analysis and Mining. *Lecture Notes in Social Networks, Springer, 6,* 563-587.

[18] Grzywaczewski, A., Iqbal, R., Shah, N., and James, A. (2010). E-Marketing Strategy for Businesses. *E-Business Engineering (ICEBE), 2010 IEEE 7th International Conference,* 482-434.

[19] Hu, Y., Shin, J., Tang, Z. (2010). Pricing of Online Advertising: Cost-per-Click-through vs. Cost-per-Action. *IEEE, Proceedings of the 43rd Hawaii International Conference on System Sciences,* 1-9.

[20] Huang, P., Liu, H., Chen, C., and Cheng, P. (2013). The Impact of Social Diversity and Dynamic Influence Propagation for Identifying Influencers in Social Networks. *IEEE/WIC/ACM International Joint Conferences on Web Intelligence (WI) and Intelligent Agent Technologies (IAT), 1,* 410-416.

[21] Huang, Y., and Cheng, F. (2013). The Effect of Online Sales Promotion Strategies on Consumers' Perceived Quality and Purchase Intention - A Moderating Effect of Brand Awareness. *The 5th International Conference on Service Science and Innovation,* IEEE, 91-95.

[22] Ilfeld, J.S., and Winer, R.S. (2002). Generating Website Traffic. *Journal of Advertising Research, 42*(5), 49-61.

[23] Jalali, A., Kolay, S., Folders, P., and Dasdan A. (2013). Scalable Audience Reach Estimation in Real-time Online Advertising. *The 3th International Conference on Data Mining Workshops, IEEE,* 629-637.

[24] Kaptein, M., Nass, C., Parvinen, P., and Markopoulos P. (2013). Nice to Know You: Familiarity and Influence in Social Networks. *The 46th Hawaii International Conference on System Sciences (HICSS), IEEE,* 2745-2752.

[25] Kardan, A., and Hooman, M. (2013). Targeted Advertisement in Social Networks using Recommender Systems. *The 7th International Conference on E-Commerce in Developing Countries, IEEE,* 1-13

[26] Klapdor, S. (2013). Effectiveness of Online Marketing Campaigns. *Springer Fachmedien Wiesbaden,* 15-23.

[27] Kristyan, S., Suhard, Albarda, Dabarsyah B. (2013). Targeted Advertising Optimization Using Vector Space Model for Online Behavior on News Portal Computational Advertising Case Study : harianjogja. com. *Joint International Conference on Rural Information & Communication Technology and Electric-Vehicle Technology, IEEE,* 1-6.

[28] Kumar, L., Singh, H., and Kaur, R. (2012). "Web Analytics and Metrics: A Survey". *ICACCI '12 Proceedings of the International Conference on Advances in Computing, Communications and*

*Informatics, ACM,* 966-971

[29] Lecocq, R., Martineau, É., and Caropreso, M. (2013). An Ontology-based Social Network Analysis Prototype. *IEEE International Multi-Disciplinary Conference on Cognitive Methods in Situation Awareness and Decision Support (CogSIMA),* 149-154.

[30] Lee, K., Ganti, R., Srivatsa, M., and Mohapatra, P. (2013). Spatio-Temporal Provenance: Identifying Location Information from Unstructured Text. *The 5th International Workshop on Information Quality and Quality of Service for Pervasive Computing, IEEE,* 499-504.

[31] Li, Y., and Lai, C. (2013). A Diffusing Path Planning Mechanism for Marketing Information Propagation over Social Media. *The 46th Hawaii International Conference on System Sciences,* 2863-2871.

[32] Li, X., Cheng, S., Chen, W., and Jiang, F. (2013). Effective Method for Promoting Viral Marketing in Microblog. *SocialCom IEEE,* 665-670.

[33] Liu, B. (2012). Sentiment Analysis and Opinion Mining (Synthesis Lectures on Human Language Technologies). *Morgan & Claypool Publishers, 1.*

[34] Lo, C., Yu, K., Ouyang, W., and Lee, C. (2012). Design A Location-Time Based Ethnic Advertising Recommendation System Using Degree Of Memberships. *International Conference On Machine Learning And Cybernetics, IEEE,* 1708-1714.

[35] Maghami, M., and Sukthankar, G. (2013). Hierarchical Influence Maximization for Advertising in Multi-agent Markets. *IEEE/ACM International Conference on Advances in Social Networks Analysis and Mining,* 21-27.

[36] Magnani, M., Montesi, D., and Rossi, L. (2013). Factors Enabling Information Propagation in a Social Network Site. *Lecture Notes in Social Networks, Springer, 6,* 411-426.

[37] Manchanda, P., Dubé, J. P., Goh, K. Y., and Chintagunta, P. K. (2006). The Effect of Banner Advertising on Internet Purchasing. *Journal of Marketing Research, 43*(1), 98-108.

[38] Moe, W. W., and Fader, P. S. (2004). Dynamic Conversion Behavior at E-commerce Sites. *Management Science, 50*(3), 326-335.

[39] Moyano, L., Thomae, O., and Frias-Martinez, E. (2012). Uncovering the Spatio-Temporal Structure of Social Networks Using Cell Phone Records. *The 12th International Conference on Data Mining Workshops, IEEE, 2012,* 242-249.

[40] Namiot, D., and Sneps-Sneppe, M. (2011). A New Approach to Advertising in Social Networks- Business-Centric Check-ins. *The 15th International Conference on Intelligence in Next Generation Networks, IEEE,* 92-96.

[41] Ngonmang, B., Viennet, E., Sean, S., Stepniewski, P., Fogelman-Soulié, F., and Kirche, R. (2013). Monetization and Services on a Real Online Social Network Using Social Network Analysis. *The 13th International Conference on Data Mining Workshops, IEEE,* 185-193.

[42] Oliveira, C., Laurindo, F. (2011). A Framework of Web Analytics: Deploying the Emergent Knowledge of Customers to Leverage Competitive Advantage. *The International Conference on E-Business (ICE-B), IEEE,* 1-6.

[43] Pai, D., Ravindran, B., and Rajagopalan, S. (2013). Automated Faceted Reporting for Web Analytics. *The 4th International Workshop on Web-Scale Knowledge Representation Retrieval and Reasoning, ACM,* 9-16.

[44] Paivio, A., and Yarmey, A. D. (1966). Pictures versus Words as Stimuli and Responses in Paired-associate Learning. *Psychonomic Science, 5*(6), 235-236.

[45] Park, D., Cho, E., and On, B. (2013). Social Spam Discovery Using Bayesian Network Classifiers based on Feature Extractions. *The 12th International Conference on Trust, Security and Privacy in Computing and Communications, IEEE,* 1808-1811.

[46] Petty, R. E., and Cacioppo, J. T. (1986). *The Elaboration Likelihood Model of Persuasion* (1-24). New York: Springer.

[47] Rachman1, Z., Maharani, W., and Adiwijaya. (2013). The Analysis and Implementation of Degree Centrality in Weighted Graph in Social Network Analysis. *International Conference of Information and Communication Technology (ICoICT), IEEE,* 72-76.

[48] Ranjan, R., Charul, Vyas, D., and Guntoju D. (2014). Balancing the Trade-Off Between Privacy and

Profitability in Social Media Using NMSANT. *International Advance Computing Conference (IACC), IEEE,* 477-483.

[49] Shang, Y., Zhang, P., Cao, Y., and Guo, L. (2013). Behavioral Targeting with Social Regularization. *International Conference on Intelligence and Security Informatics (ISI), IEEE,* 233-238.

[50] Sherman, L., and Deighton, J. (2001). Banner Advertising: Measuring Effectiveness and Optimizing Placement. *Journal of Interactive Marketing, 15*(2), 60-64.

[51] Singh, S. N., Lessig, V. P., Kim, D., Gupta, R., and Hocutt, M. A. (2000). Does Your Ad Have Too Many Pictures? *Journal of Advertising Research, January-April,* 11-27.

[52] Siranovic, I., Cavka, T., Petric, A., and Podobnik, V. (2013). A Bidding Agent for Advertisement Auctions: An Overview of the CrocodileAgent. *Springer-Verlag Berlin Heidelberg,* 71-86.

[53] Siri, A., and Thaiupathump, T. (2013). Analysis Model for Measuring Information Flow in Social Networks. *International Computer Science and Engineering Conference (ICSEC), IEEE*, 348-353.

[54] Uda, R. (2013). Privacy Obfuscation with Bloom Filter for Effective Advertisement. *The 27th International Conference on Advanced Information Networking and Applications Workshops,* 941-946.

[55] Vladimir, K., Pavli´c, Z., and Srblji´c, S. (2013). Erl-Metafeed: Web Feeds Mashup Engine and GUI Widget Toolkit. *EuroCon, IEEE,* 11-17.

[56] Waisberg, D., and Kaushik A. (2009). Web Analytics 2.0: Empowering Customer Centricity PII. *Search Engine Marketing Digital Journal, 2*(1).

[57] Wang, H., and Doong, H. (2014). Effects of Online Advertising Strategy on Attitude Towards Healthcare Service. *The 47th Hawaii International Conference on System Science, IEEE,* 2725-2732.

[58] Yang, Y., and Huang, E. (2011). Interactivity and Social Media Marketing: Case study of Taiwan Companies. *International Conference on E-Business and E-Government (ICEE)*, 1-3.

[59] Yang, Y., Li, V., and Xu, K. (2013). An Incentive Scheme for Non-Cooperative Social Networks under the Independent Cascade Model. *IEEE/WIC/ACM International Conferences on Web Intelligence (WI) and Intelligent Agent Technology (IAT),* 565-570.

[60] Yang, Y., Zhang, J., Qin, R., Li, J., and Wang, F. (2012). A Budget Optimization Framework for Search Advertisements Across Markets. *IEEE Transactions on Systems, Man, and Cybernetics—Part A: Systems and Humans, 42*(5), 1141-1151.

[61] Yang, Y., Zhang, J., Qin, R., Li, J., Liu, B., and Liu, Z. (2013). Budget Strategy in Uncertain Environments of Search Auctions: A Preliminary Investigation. *IEEE Transactions on Services Computing,* 168-176.

[62] Zadeh, P., and Moshkenani, M. (2008). Mining Social Network for Semantic Advertisement. *The 3rd International Conference on Convergence and Hybrid Information Technology,* 611-618.

[63] Zhang, X. (2012). Can You See Me Now? Design SEO-friendly Classroom Blogs for Reaching Valuable Public. *International Conference on Information Technology- New Generations, IEEE,* 852-853.

[64] Zhao, Y., Niu, K., He, Z., Li,n J., and Wang, X. (2013). Text Sentiment Analysis Algorithm Optimization & Platform Development in Social Network. *Sixth International Symposium on Computational Intelligence and Design, IEEE*, 410-413.

# ◆ About the Authors ◆

**Anthony Nosshi**

Anthony Nosshi is a PhD student at Computer and Information System Department, Faculty of Computer and Information, Mansoura University, Egypt. He obtained his B.S. in information systems from Sadat Academy at 2004. He got a software development diploma from ITI, Egypt at 2005 and he got M.SC degree in information system from Sadat Academy for Management Sciences in 2011. Now he is an assistant lecturer in Computer and Information Systems Department at Sadat Academy, Egypt. His research interests are the Information system, Information Retrieval, Data mining, Web mining, Internet marketing, Data Analysis, and Text mining.

**M. Badr Senousy**

M. Badr Senousy is a professor of computer and information systems at Sadat Academy for Management Sciences, Cairo, Egypt. He has received a PhD in computer science in 1985 at George Washington University, USA.

**Aziza Saad Ahmed Assem**

Aziza Saad Ahmed Assem is a professor of computer and information systems at Faculty of Computers and Information Sciences, Mansoura, Egypt. She has received a PhD in 1996 and a MS in 1981. She has supervised master studies

Submitted: August 12, 2014; 1st Revision: January 30, 2015; Accepted: April 7, 2015