NEW INFORMATION TECHNOLOGY IMPACTS ON TRAVEL INDUSTRY

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ABSTRACT
New information technology(IT) has already triggered a great impact on the modern travel industry, such as Uber. The company develops, markets and operates the Uber mobile app, which allows consumers with smartphones to submit a trip request which is then routed to Uber drivers who use their own cars. The purpose of this study is to research that what professional managers are thinking and reacting while facing the rising development of new technology, for example Mobile Apps? In conclusion, this world is changing all the time that all we need to do is adapted into the new environment. This study will provide suggestions those who are interested in travel business who may use the results of this study as guidelines as travel agents prepare themselves for the impact of new technology in travel business marketing.

Keywords: New Technology, Travel Industry, Mobile App.

1. INTRODUCTION
In 2007, Apple Computer launched the iPhone, the company’s first-ever smartphone. Since July 2008, the Apple App Store started a whole new business model with the release of iPhone OS 2.0 that competitors rushed to introduce their own mobile software markets [1]. Not only personal use of cloud services such as webmail, facebook, YouTube for some years, but also the organizations have started to apply cloud services as a tool for their IT needs. It is estimated that by 2013 the cloud market will have reached $8.1 billion [2]. In 2009, Uber Technologies Inc. was founded, markets and operates the Uber mobile app, which allows travelers with smartphones to submit a trip request which is then routed to Uber drivers who use their own cars [3]. In the past ten years especially, the economy and society have changed rigorously, and not only the incomes of consumers but also the dollar amounts of purchases have risen. Consumers’ habits of purchasing travel products are different than ever. In order to occupy this market, most travel agencies have invested plenty of resources and manpower in mobile app markets in order to provide the new business opportunities and increased convenience the Internet can provide, through which customers can purchase their travel products. As a result, how do traditional travel business marketing experts feel about this change? Or do these professionals view the mobile apps as a prosperous new mode of business development? The purpose of this research is to examine what professional reactions are appropriate while facing the rising application of mobile apps?

2. LITERATURE REVIEW
Uber was founded as “UberCab” by Travis Kalanick and Garrett Camp in 2009 and the app was released the following June in US. Beginning in 2012, Uber expanded internationally. By mid-2015, Uber was estimated to be worth 50 billion dollars [4]. Its notable features include its market-oriented architecture which is regulated by the supply and demand of mobile app resources at market equilibrium [5]. Characteristics of mobile app marketing are somewhat defined by the exiting computing concepts such as network computing, grid computing, utility computing, pervasive computing, and service computing [6].

According to Kotler, marketing is a social and management process by which a person or a group can create values and trade products to satisfy people’s needs and desires, and this process by the way of Internet is referred to as “Internet marketing [7].” Enterprises identified the opportunity to utilize the Internet mobile devices as a medium to provide and transfer information in order to achieve the goals of promotion and sales. McMaster pointed out that executing Internet marketing with promotion and sales could increase sales volume considerably [8]. Kumar stated that a business is suitable for Internet mobile device marketing when it 1) provides a service, 2) sells fashion products, 3) offers a product for which customers are seeking a low price, and 4) provides a low product delivery cost [9]. In such situations, businesses can easily build a sustainable relationship with clients and achieve increased sales goals.
Mobile app computing serves different purposes and target different customers however they share a common business model that is that they ‘rent’ the use of their communication resources including services, applications, infrastructures, and platform to customers. This model is similar to the application service provider model in which a service provider provides software, infrastructure, people, and maintenance to run in a customized fashion for the customer [10]. Paperless on-line distribution system provides not only cost reduction but also time saving benefits [11]. Thompson, Higgins, and McAllister concluded that travel agencies can gain the following advantages by using mobile app marketing: 1) communications may proceed in all-day, year-round marketing broadcasting, 2) updates to travel information can take place any time without a printing fee, 3) costs are reduced through the integration of paper and electronic media with multimedia materials, 4) travel agencies can supply hyperlinks with travel information through which consumers can learn and seek more services, 5) companies enjoy better selling effects when consumers initiate their own browsing of travel information on the Internet, 6) customers can buy the travel products they want directly, and 7) Internet marketing techniques can focus on a specific target population[12] [13] [14].

Travel products are seldom necessities; therefore, it is often difficult to push sales. The travel industry, as a service business, combines high-quality service with well-trained customer relationship skills. Personal selling plays an important role in the purchase process. Assael indicated that most travel agency consumers understand the importance of tour arrangements, so their buying behaviors require high involvement [15]. Therefore, the selling process is considered part of the assistance given by travel agents, and such support is not easily replaced by new IT marketing. In the travel industry, marketing performance considers customer relationships valuable; consequently, traditional agents may think that Internet marketing is not suitable for travel product selling. In addition, customers are cautious about providing their credit card information on the Internet because the never-ending hackers and thus travel agency may consider give other paying methods as alternatives [11].

Uber, As previously discussed, developed a marketing model by mobile app handles two traditional marketing values – promotion and distribution – which used to belong solely to travel agency salespeople. However, the Internet can not technically replace the relationship between the consumer and the tour conductor. Nevertheless, in light of the rise in mobile app usage for travel needs, how do travel business experts view such a shift? What professional aspects are appropriate while facing the rising application of mobile app marketing? This study seeks to answer such questions.

3. METHODOLOGY
The purpose of this study was to identify and rank travel business reactions for the travel marketing experts in Taiwan. A collective case study with mixed-method approach, which can facilitate explanation, prediction, and develop a more holistic view [16], was employed. Qualitative data from interviews, along with quantitative data were used to help rank travel business reactions and interpret results. In other words, a triangulation research design was used. This study simultaneously collected both qualitative and quantitative data, compared results, to attempt to validate findings of each type.

Participants and sampling The participants (N = 10) were selected by purposive sampling of people who were in travel business for more than ten years. Purposive sampling is mainly used for opinion surveys [17]. For this study, participants were required to have been in the travel related business for at least ten years. Interviews were conducted via phone with ten participants, seven were from model travel companies in Taiwan, three were from the professors who has related research in travel business.

Instrumentation. The interviews protocol was developed in English and based on the literature review. The English instrument then double-blind translated into Chinese to achieve equivalency. The interviews explored more fully the perceptions of the people of experience about the life insurance agent turnover intentions. Interviews were conducted in Chinese. The codes and supporting words emerging from the transcripts of interviews were translated into English for analyzing. The standardized interview questions consisted of a set of questions carefully worded and arranged for the purpose of taking each respondent through the same sequence and asking each respondent the same questions with essentially the same words [18].

Validity and reliability. The possible marketing strategy on the new IT environment were derived from various literatures or research findings. According to Johnson and Christensen [18], cross-checking information and conclusions through the use of multiple procedures or source strategies promotes qualitative research validity. Standardized interview questions were used in each case. This minimized variation in the questions posed, and improved the reliability of the interviews. Instruments used in this study minimized the variation of the questions posed to interviewees.
Data analysis. The qualitative data analysis was achieved by note taking, transcribing, reading, rereading and coding. The data were coded relative to themes explored through the questions asked in each interview. The technique for order preference by similarity to ideal solution TOPSIS (Yang and Chou, 2005) method was conducted to rank the marketing strategy for travel agent representatives. The calculating procedure of TOPSIS is discussed as following:

Let \( X_1, X_2, \ldots, X_i, \ldots, X_N \) be series with \( k \) entities (or quality characteristics) and \( N \) detected candidate schemes

\[
X_1 = \{x_1(1), x_1(2), \ldots, x_1(j), \ldots, x_1(k)\},
\]

\[
\vdots
\]

\[
X_i = \{x_i(1), x_i(2), \ldots, x_i(j), \ldots, x_i(k)\},
\]

\[
\vdots
\]

\[
X_N = \{x_N(1), x_N(2), \ldots, x_N(j), \ldots, x_N(k)\}.
\]

The similarity to ideal solution has five step, as following:
1. Data normalization

This research normalizes as follows:

\[
Y_{ij} = \frac{x_{ij}}{\sqrt{\sum_{i=1}^{N} x_{ij}^2}}
\]

(1)

where \( x_{ij} \) is the original data of \( j \)-th entity of the \( i \)-th candidate scheme.

2. Calculate the weight of normalization data

\[
v_{ij} = W_j r_{ij}, \quad i = 1, 2, \ldots, N; \quad j = 1, 2, \ldots, k
\]

(2)

where \( W_j \) is the weight of the \( j \)-th data and \( \sum_{j=1}^{k} W_j = 1 \).

3. Decide the ideal solution \( A^* \) and negative ideal solution \( A^- \)

\[
A^* = \{v_{1}^*, v_{2}^*, \ldots, v_{m}^*\} = \left\{\max_{i} v_{ij} \mid j \in J_1 \right\} \left\{\min_{i} v_{ij} \mid j \in J_2 \right\} \quad i = 1, \ldots, m
\]

\[
A^- = \{v_{1}^-, v_{2}^-, \ldots, v_{m}^-\} = \left\{\min_{i} v_{ij} \mid j \in J_1 \right\} \left\{\max_{i} v_{ij} \mid j \in J_2 \right\} \quad i = 1, \ldots, m
\]

(3)

where \( J_1 \) is an utility set and \( J_2 \) is a cost set.

4. Calculate the separation measure The distance between the ideal solution is

\[
S_{i}^* = \sqrt{\sum_{j=1}^{k} (v_{ij} - v_{j}^*)^2}, \quad i = 1, 2, \ldots, N; \quad j = 1, 2, \ldots, k
\]

(4)

The distance between the negative ideal solution is

\[
S_{i}^- = \sqrt{\sum_{j=1}^{k} (v_{ij} - v_{j})^2}, \quad i = 1, 2, \ldots, N; \quad j = 1, 2, \ldots, k
\]

(5)

5. Calculate the degree of near to the ideal solution for each candidate scheme

\[
C_{i}^* = \frac{S_{i}^-}{S_{i}^* + S_{i}^-}
\]

(6)

where \( 0 \leq C_{i}^* \leq 1 \) and the closer \( C_{i}^* \) is to 1, means the closer the candidate scheme is to the ideal solution \( A^* \).

Therefore, we can rank the schemes by their corresponding value of \( C_{i}^* \). The larger value of \( C_{i}^* \) corresponds to the better scheme.
Thus, the TOPSIS method can detect the priority of the turnover determinants based upon participants’ opinions. The procedures of detecting order of the priority are:
1. Sample 10 participants and measure their quality characteristics for 10 ranks.
2. Make data normalization for determining \( v_j \).
3. Compute the weight of normalization data \( v_j = W_j r_{ij} \).
4. Decide the ideal solution \( A^+ \) and negative ideal solution \( A^- \).
5. Compute the distance of ideal solution \( S_i^+ \) and negative ideal solution \( S_i^- \).
6. Compute the similarity to ideal solution \( C_i \) and can be to see the order for 10 ranks with the participants’ opinions.

4. DATA ANALYSIS
The numerical illustration follows the procedures as discussed in previous section: Sample 10 ranks and their multiple factors are graded based upon ten travel business related interviewees’ opinions (see table 1).

<table>
<thead>
<tr>
<th>Impact Factors</th>
<th>Expert 1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>IF1. Because of new IT, sales become more easy</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>4</td>
<td>4</td>
<td>5</td>
<td>5</td>
<td>4</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>IF2. Sales achievements higher with mobile app</td>
<td>4</td>
<td>5</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>5</td>
<td>4</td>
<td>4</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>IF3. Visit previous clients, even they do not need my services</td>
<td>3</td>
<td>3</td>
<td>4</td>
<td>2</td>
<td>4</td>
<td>2</td>
<td>1</td>
<td>3</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>IF4. The travel business will be improved with new IT</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>IF5. Use more new IT to communicate with customers</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>2</td>
<td>2</td>
<td>5</td>
<td>2</td>
<td>4</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>IF6. Need to update new information more often</td>
<td>3</td>
<td>4</td>
<td>4</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>IF7. For a travel agent like me, clients are increasing</td>
<td>4</td>
<td>3</td>
<td>5</td>
<td>2</td>
<td>3</td>
<td>3</td>
<td>4</td>
<td>3</td>
<td>5</td>
<td>3</td>
</tr>
<tr>
<td>IF8. Consider mobile app means new consumers</td>
<td>4</td>
<td>4</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>IF9. Had experiences of losing clients to Internet marketing</td>
<td>3</td>
<td>4</td>
<td>2</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>2</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>IF10. Much more prepared when visiting potential customers</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>4</td>
<td>2</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>3</td>
<td>2</td>
</tr>
</tbody>
</table>

Data normalization are obtained by using Eqs.(1). The results are tabulated in Table 2.

<table>
<thead>
<tr>
<th>Impact Factor</th>
<th>Interviewees</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>IF1</td>
<td>0.42108</td>
<td>0.42108</td>
<td>0.42108</td>
<td>0.33686</td>
<td>0.33686</td>
<td>0.33686</td>
<td>0.33686</td>
<td>0.42108</td>
<td>0.42108</td>
<td>0.33686</td>
<td>0.42108</td>
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<tr>
<td>IF2</td>
<td>0.33686</td>
<td>0.42108</td>
<td>0.42108</td>
<td>0.33686</td>
<td>0.25265</td>
<td>0.42108</td>
<td>0.33686</td>
<td>0.33686</td>
<td>0.25265</td>
<td>0.33686</td>
<td>0.33686</td>
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<tr>
<td>IF3</td>
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<td>0.25265</td>
<td>0.33686</td>
<td>0.16843</td>
<td>0.33686</td>
<td>0.16843</td>
<td>0.08422</td>
<td>0.25265</td>
<td>0.16843</td>
<td>0.16843</td>
<td>0.16843</td>
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<tr>
<td>IF4</td>
<td>0.42108</td>
<td>0.42108</td>
<td>0.42108</td>
<td>0.33686</td>
<td>0.25265</td>
<td>0.33686</td>
<td>0.42108</td>
<td>0.33686</td>
<td>0.25265</td>
<td>0.33686</td>
<td>0.33686</td>
</tr>
<tr>
<td>IF5</td>
<td>0.33686</td>
<td>0.33686</td>
<td>0.33686</td>
<td>0.16843</td>
<td>0.16843</td>
<td>0.42108</td>
<td>0.33686</td>
<td>0.33686</td>
<td>0.33686</td>
<td>0.33686</td>
<td>0.33686</td>
</tr>
<tr>
<td>IF6</td>
<td>0.25265</td>
<td>0.33686</td>
<td>0.33686</td>
<td>0.16843</td>
<td>0.25265</td>
<td>0.33686</td>
<td>0.25265</td>
<td>0.16843</td>
<td>0.16843</td>
<td>0.16843</td>
<td>0.16843</td>
</tr>
<tr>
<td>IF7</td>
<td>0.33686</td>
<td>0.25265</td>
<td>0.42108</td>
<td>0.16843</td>
<td>0.25265</td>
<td>0.25265</td>
<td>0.33686</td>
<td>0.25265</td>
<td>0.42108</td>
<td>0.25265</td>
<td>0.25265</td>
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<tr>
<td>IF8</td>
<td>0.33686</td>
<td>0.33686</td>
<td>0.42108</td>
<td>0.33686</td>
<td>0.25265</td>
<td>0.33686</td>
<td>0.33686</td>
<td>0.33686</td>
<td>0.25265</td>
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<td>IF9</td>
<td>0.25265</td>
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<td>0.16843</td>
<td>0.25265</td>
<td>0.16843</td>
<td>0.16843</td>
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<td>0.16843</td>
<td>0.16843</td>
<td>0.16843</td>
<td>0.16843</td>
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<tr>
<td>IF10</td>
<td>0.33686</td>
<td>0.25265</td>
<td>0.16843</td>
<td>0.33686</td>
<td>0.16843</td>
<td>0.33686</td>
<td>0.25265</td>
<td>0.16843</td>
<td>0.25265</td>
<td>0.16843</td>
<td>0.16843</td>
</tr>
</tbody>
</table>

Compute \( \Delta_0(j) \). Decide the ideal solution \( A^+ \) and negative ideal solution \( A^- \) using Eqs. (3). The results are tabulated in Table 3.
Table 3. The Result of $\Delta_{v_i}(j)$

<table>
<thead>
<tr>
<th>$A^*$</th>
<th>0.42108</th>
<th>0.42108</th>
<th>0.42108</th>
<th>0.33686</th>
<th>0.33686</th>
<th>0.42108</th>
<th>0.42108</th>
<th>0.42108</th>
<th>0.42108</th>
</tr>
</thead>
<tbody>
<tr>
<td>$A^-$</td>
<td>0.25265</td>
<td>0.25265</td>
<td>0.16843</td>
<td>0.16843</td>
<td>0.16843</td>
<td>0.16843</td>
<td>0.08422</td>
<td>0.16843</td>
<td>0.16843</td>
</tr>
</tbody>
</table>

Compute the distance of ideal solution $S^*_i$ and negative ideal solution $S^-_i$ using Eqs. (4) and Eqs. (5). The results are tabulated in Table 4.

Table 4. The Result of $S^*_i$ and $S^-_i$

<table>
<thead>
<tr>
<th>$S^*_i$</th>
<th>IF1</th>
<th>IF2</th>
<th>IF3</th>
<th>IF4</th>
<th>IF5</th>
<th>IF6</th>
<th>IF7</th>
<th>IF8</th>
<th>IF9</th>
<th>IF10</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0.11910</td>
<td>0.25265</td>
<td>0.65233</td>
<td>0.23820</td>
<td>0.40388</td>
<td>0.55224</td>
<td>0.40388</td>
<td>0.27931</td>
<td>0.57118</td>
<td>0.56493</td>
</tr>
<tr>
<td>$S^-_i$</td>
<td>IF1</td>
<td>IF2</td>
<td>IF3</td>
<td>IF4</td>
<td>IF5</td>
<td>IF6</td>
<td>IF7</td>
<td>IF8</td>
<td>IF9</td>
<td>IF10</td>
</tr>
<tr>
<td></td>
<td>0.68933</td>
<td>0.57118</td>
<td>0.25265</td>
<td>0.60142</td>
<td>0.44562</td>
<td>0.31510</td>
<td>0.47639</td>
<td>0.51914</td>
<td>0.27931</td>
<td>0.31510</td>
</tr>
</tbody>
</table>

Compute the similarity to ideal solution $C^*_i$ using Eq. (6) to determine the order grade. The result reported in Table 5.

Table 5. Summary of the Similarity to Ideal Solution $C^*_i$

<table>
<thead>
<tr>
<th>$C^*_i$</th>
<th>C1</th>
<th>C2</th>
<th>C3</th>
<th>C4</th>
<th>C5</th>
<th>C6</th>
<th>C7</th>
<th>C8</th>
<th>C9</th>
<th>C10</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0.85286</td>
<td>0.69332</td>
<td>0.27917</td>
<td>0.71630</td>
<td>0.52457</td>
<td>0.36330</td>
<td>0.54119</td>
<td>0.65018</td>
<td>0.32841</td>
<td>0.35806</td>
</tr>
</tbody>
</table>

From Table 5, this study decided the similarity to ideal solution was:

$$C1 > C4 > C2 > C8 > C7 > C5 > C6 > C10 > C9 > C3$$

In other words, after conducting the TOPSIS, this research showed the rank of 18 turnover factor for hotel employees from the most important to the least important, but still crucial, turnover factor is showed as followings: (C1) Because of new IT, sales become more easy, (C4) The travel business will be improved with new IT, (C2) Sales achievements higher with mobile app, (C8) Consider mobile app means new consumers, (C7) For a travel agent like me, clients are increasing, (C5) Use more new IT to communicate with customers, (C6) Need to update new information more often, (C10) Much more prepared when visiting potential customers, (C9) Had experiences of losing clients to Internet marketing, (C3) Visit previous clients, even they do not need my services.

5. CONCLUSION

With the process of TOPSIS, the top three appropriate reactions selected by the interviewees were “Because of new IT, sales become more easy”, “The travel business will be improved with new IT”, and “Sales achievements higher with mobile app”. Actually, new technology is much more humanized and convenient than ever before. Since the development of mobile app in travel industry is inevitable, a positive attitude is even more important. With a right attitude and efficient technology, sales achievements and business will surely be improved. This means that a travel agent with higher work devotion, and higher new technology acceptance and prospect that one will decide the values which guide him in the varying working environment.

However, the top three disagreed reactions selected were “Visit previous clients, even they do not need my services”, “Had experiences of losing clients to Internet marketing”, “Much more prepared when visiting potential customers”. New communication applications, such as smartphones and communication software, already developed a new communication environment. Traditional sales skill needs to be modified with this new environment that means an agent should spend more time on Internet instead of personal visiting. The interviewees believe that the lack of faith can manifest a travel agent as irritation, frustration and exasperation. It is a sign that a travel agent is not looking at the new circumstances with faith that he must be fearful to indulge in disappointment and failure.
Therefore, if a travel agent has confidence or interests on the new marketing environment with mobile app prospect, strategies in which to make use of new technology will be a solution to overcome in the changing environment. Elevated work devotion enhanced the communication with clients that much more valuable information was exchanged, and they think those relationships are improved. In conclusion, the rise of new marketing IT with mobile apps is just a neutral technology development, face it with positive thinking or not will lead to a different end for a travel agent in travel industry.

6. REFERENCES


