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Googlization Factors of Saudi Eastern Province Virtual Cities. Factors Analysis of Eastern Province Virtual Cities

Talal A Al-Hairig, Ahmed J Al-Jaralah

(Engineer Talal Al-Harigi, Saudi Aramco, P.O Box 6816, Dhahran 31311, Saudi Arabia talal@araburban.net)
(Prof. Ahmed J Al-Jaralah, Dammam University, Department of Urban and Regional Planning, Saudi Arabia, pro_ajj@hotmail.com)

1 ABSTRACT

Over the past urban areas evolves based on the human needs and the way they conduct their life activities. The agriculture era evolved the human settlements around the water and fertile lands. Then croup production and market start taking place within the settlement and re-shape its land uses.

The industrial revolution and car invention introduced industrial areas that evolved the transportation means and expanded the settlements size and changed its pattern. The human settlements become cities that have land use regulations, market mechanism, and civil infrastructure, political and environmental places.

These factors influenced the physical pattern of cities since then. On the last 20 years third evolution on emerged through Information Technology (IT) and starts showing their impact on means of human activities and consequently their settlements pattern. Various human activities used to be conducted by physical presence become attainable through virtual means. Consequently, urban areas have been influenced by the presence of IT and the policies governing it's penetration on the urban and regional level. This study attempts to study the phenomena of virtual cities in the Eastern Province in Saudi Arabia by relating their population size to their presence on the cyberspace.

Key words: Virtual cities, cyberspace, Saudi cities, Urban Information Technology, Eastern Province

2 SIGNIFICANCE OF THE STUDY

This study intended to provide new methods of analyzing cities virtual transformation through tracing its presence in the cyberspace. Furthermore, the study attempt to fill in a gap in the practical implementation on the Urban Planning practice in developing new tools relate the actual cities physical variation to their virtual cyber variation.

3 STUDY DESIGN AND METHODOLOGY

This part of the study dedicated to the study methodology which will lead to understanding the diffusion of Eastern Province cities in the cyberspace in relation to the cities size.

3.1 Study Methodology

The study used descriptive survey methodology and factor analysis as the goal of the study focus on exploring the phenomena of varies cities presence in the cyber space. The study intended to explore this phenomenon, its degree of presence and identify whether population is a determinant variable or not.

Factor analysis is frequently used to analyze and extract observation on the main factors that relates to the phenomena.

3.2 Study Population:

The study included all the cities of Eastern Province that has 15000 population or more, excluding two cities. These cities are Al-Thoqubah which is part of Al-Khubar and the indices related to it interchangeable with Al-Khubar. Second city is Al-Oyun which has show high interference in search engine from another city with the same name in Moraco. This will limit the study population with 25 cities which will be the cases studied against 9 variables as show in below matrix.

3.3 Data Collection and Variables:

The goal of this section is highlight the data collection methods and the 8 variables that will be used to explore virtual presence of each city. Each variable will be explained to introduce them as contemporary means of analyzing cities on the cyberspace.

3.3.1 Population:

This study assumes population is a determinant variable in the virtual presence of cities due to the city residence contribution to the internet content. The study will test this hypothesis against the presence of Eastern Province cities in the search engine by the level activities either provided by non-residence like news targeting the cities residence or by the citizen's interaction about their cities in the cyberspace.

3.3.2 Google Search Engine City Frequencies:

Among all the famous search engines Google is the only one has (.sa). At the same time Google is the highest visited search engine in Saudi Arabia. It is ranked the 3rd, 6th, 11th and 16th among the highly 46 websites visited in Saudi Arabia (CITC, 2009). The CITC (who is) records show the domain has been registered in 11-01-2004 with physical representation in Riyadh Saudi Arabia (CITC S. N., 2009). Hence, the Saudi Google is selected to be the search engine of this study as it is expected to provide more local content than others. On the search the restricted searches on the exact wording or phrase like "Dammam City". In addition, the Arabic language was the only language used in searching the cases. The search result appears against the researched case will be inputted in the Google search filed for the subject city. The result indicates the number of times the city has inputted in the web content and Google search engine where able to identify it.

3.3.3 Google Groups

Then similar steps with restricted search phrase like "Al-Dammam City" will be used for Google groups search. The presence of the city name on the groups search engine represents an individual interaction about the city mainly from people living in the city or people targeting cities residence. It can be considered as the interaction of the residence in the physical space through the cyberspace. This represents a duality of interaction and substitution to the face to face interaction.

3.3.4 Google Blogs Search

Similar to the groups however it differ in the mean of interaction which is based on an individual more than a group that allow individual broadcast his ideas and thoughts. It is a kind of an individual expressing himself and interests to others. This virtual media can be considered as leverage of individual to communicate to others reflecting their virtual or physical activities on the cyberspace.

3.3.5 Google Images Search

Another side of Google search engine however, it focuses only on the images about the city and their residence activities. It provides more focus representation of the duality between physical virtual. This web content take pieces of the cities and their residence activities to the cyberspace.

3.3.6 YouTube Search

Represent a transfer of interaction of cities residence from face to face story telling or events attending to virtual means. This interaction delimited the time as it can be seen at any time and distance as it can be watched of being online at any physical space. During the data collection it was clearly observed that these virtual activities are merely individuals not institutes or business.

3.3.7 FaceBook Groups, People and Events

Facebook allows different individuals and groups to network with other users who can join each other networks. It also allows privacy settings on basis of networks. Groups are used for discussions and events etc. Groups are a way of enabling a number of people to come together online to share information and discuss specific subjects. While, Facebook events are a way for members to let friends know about upcoming events in their community and to organize social gatherings in relation to their physical content.

3.4 Study Cases and Variables

The following table show a matrix of the studded cities ranked according to the population size. The matrix indicates the raw data before applying the correlation factors and indicates only frequencies. On simple stastsics the indication show lead to large city population indicates higher we content.

Case Number	City	Population	Google Search	Google Groups	Blog Search	Images	YouTube	Facebook Groups	Facebook People	Facebook Events
1	Al-Dammam	744321	89200	9990	6648	10600	1130	66	68	16
2	Al-Hafouf	287841	40400	1210	477	3700	163	7	19	0
3	Al-Mubaraz	287841	25200	500	285	2530	83	3	20	0
4	Hafr Al-Batin	231978	722000	1860	109	1520	131	8	2	0
5	Al-Jubail	222544	58500	7860	3057	7130	290	18	69	0
6	Al-Khubar	165799	65000	10100	5232	10100	145	52	224	21
7	Al-Qatif	98278	34700	1420	505	728	2270	43	68	0
8	Al-Dhahran	97446	169000	1190	396	2010	163	7	30	20
9	Tarout	80686	3860	266	32	307	229	2	7	0
10	Sehat	66038	24300	1050	441	2540	590	3	13	0
11	Al-Khafji	54464	16200	449	232	1640	123	1	10	0
12	Safwa	45202	22300	994	5899	2730	734	8	9	0
13	Ras Tanoura	41458	132000	466	39	475	13	0	0	0
14	Abqaiq	29631	5390	196	43	239	80	1	1	0
15	Al-Awamiah	25279	10800	320	162	684	648	4	8	0
16	Al-Qoudaih	25269	594	21	7	287	205	2	2	0
17	Anak	21159	5000	296	59	521	2	0	0	0
18	Al-Taraf	21004	18700	134	13	416	10	0	0	0
19	Al-Nouria	20964	1340	75	29	597	140	0	0	0
20	Al-Qaismah	20316	6290	75	58	218	16	0	0	0
21	Al-Halilah	16666	8	1	0	369	0	0	0	0
22	Al-Bataliah	16310	4	0	0	474	0	0	0	0
23	Al-Mizalah	16005	2	0	0	4	0	0	0	0
24	Al-Omran	15436	98200	352	180	612	7	0	0	0
25	Um Al-	15041	419	7	1	47	0	0	0	0

Table 3.1 STUDY Cases and Variables Matrix

		Population	GSearch	G Groups	Blog Search	Images	Youtube	FacebookGrp	FacebookPpl	FacebookEvt
Correlation	Population	1.000	.404	.668	.418	.699	.279	.611	.500	.402
	GSearch	.404	1.000	.206	.048	.169	.000	.141	.094	.232
	G Groups	.668	.206	1.000	.654	.955	.186	.802	.902	.618
	Blog Search	.418	.048	.654	1.000	.749	.318	.578	.571	.375
	Images	.699	.169	.955	.749	1.000	.192	.743	.857	.627
	Youtube	.279	.000	.186	.318	.192	1.000	.631	.299	.012
	FacebookGrp	.611	.141	.802	.578	.743	.631	1.000	.884	.556
	FacebookPpl	.500	.094	.902	.571	.857	.299	.884	1.000	.702
	FacebookEvt	.402	.232	.618	.375	.627	.012	.556	.702	1.000
Sig. (1-tailed)	Population		.000	.000	.000	.000	.000	.000	.000	.000
	GSearch	.000		.000	.183	.001	.495	.004	.039	.000
	G Groups	.000	.000		.000	.000	.000	.000	.000	.000
	Blog Search	.000	.183	.000		.000	.000	.000	.000	.000
	Images	.000	.001	.000	.000		.000	.000	.000	.000
	Youtube	.000	.495	.000	.000	.000		.000	.000	.409
	FacebookGrp	.000	.004	.000	.000	.000	.000		.000	.000
	FacebookPpl	.000	.039	.000	.000	.000	.000	.000		.000
	FacebookEvt	.000	.000	.000	.000	.000	.409	.000	.000	

Table 3.2 Correlation matrix, Determinant = 1.37E-005 which is 0.0000137

3.5 Populating the Correlation Matrix

The correlation matrix below show the top half of the table contains Pearson correlation coefficient between all pairs of variables whereas the bottom half contains the one-tailed significance of the coefficients. This matrix will be used to check the pattern of relationships. Fist, the significance value of the majority values is less than 0.05 in exceptions to three relations which are blog search with Google search, YouTube with

Google Search and face book with YouTube. The second verification will be by scanning the correlation coefficients which should be less than 0.9. This found only in one relation between Images and Google search. Finally since the determinant value is 0.0000137 which is slightly greater than the necessary value of 0.00001, the multicollinearity is not a problem for the collected data. Based on the three verification factors, the variables in the above correlation matrix correlate fairly well. And only one of the correlations is slightly large. Therefore, there is no need to consider eliminating any variable at this stage.

On the KMO and Bartlett's Test, a value close to one indicates that patterns of correlations are relatively compact and so factor analysis should yield distinct and reliable factors. Furthermore, values greater than 0.5 are acceptable (Kaiser, 1974), it has be described as mediocre value which ranged between 05 and 0.7 (Hutcheson and Sofroniou, 1999). For the eastern province cities cyber data the value is 0.578, which fall in the range of mentioned earlier. Based on that factor analysis is appropriate for these data. Likewise, Bartlett's measure the significance value less than 0.05 and therefore factor analysis is appropriate.

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.578
Bartlett's Test of Sphericity	Approx. Chi-Square	3.932E3
	df	36
	Sig.	.000

Table 3.3 KMO and Bartlett's Test

3.6 Factors Extraction

Three factors are extracted before extraction, after extraction and after rotation. Before extraction identified 9 linear components within the data set which are the originally entered variables. Whereas factor 1 in the initial eigenvalues and after extraction, explains the variance by 58% with 83% cumulative with second factors. While first factor explains 51% of the variance with 83.1% cumulative with the other two factors. The significant finding of the matrix above is that the first factor considered the most important as it explains the variance by 51% in the rotation loadings.

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	5.217	57.967	57.967	5.217	57.967	57.967	4.563	50.695	50.695
2	1.222	13.580	71.548	1.222	13.580	71.548	1.553	17.257	67.953
3	1.039	11.546	83.094	1.039	11.546	83.094	1.363	15.141	83.094
Extraction Method: Principal Component Analysis.									

Table 3.4 Total Variance Explained

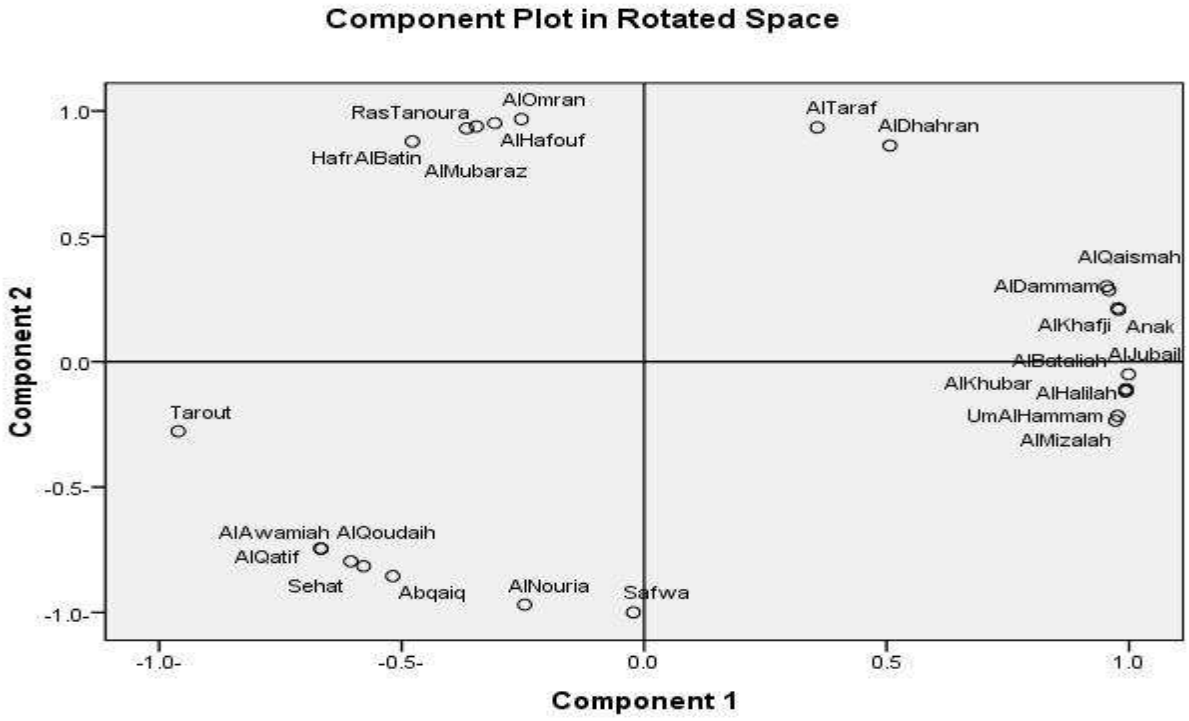
3.7 Rotated Variables Component Matrix:

The below table show the rotated factor matrix which represent the factor loadings for each variable onto each factor. It is important to note that loading less than 0.4 have not been displayed because it has been suppressed. In addition, the output has been set in SPSS to be sorted by size.

	Component		
	1	2	3
Google Images	.939		
Google Groups	.932		
FaceBook People	.920		
FaceBook Events	.772		
FaceBook Groups	.753	.573	
Blog Search	.703		
YouTube		.968	
Google Search			.949
Population	.548		.580
Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization. a. Rotation converged in 4 iterations.			

Table 3.5 Rotated Component Matrixes

The above matrix indicates there are three factors affect the diffusion of cities in the cyberspace. The variables that load highly on factor 1 seem to all related to citizens interaction in the cyberspaces as substitution to the face-to-face physical interaction. It should be noted that, population has the least loading which indicates the less relevance of population size to the city cyber presence. Only to variables load to factor 2 which are YouTube and face book groups. While Google search and population load highly in factor 3 with less load value for population. These phenomena re-enforce the low relevance between city population and its cyber presence.



4 CITIES RANKING ACCORDING TO THEIR VIRTUAL PRESENCE

This stage of the study identifies the ranking of eastern province cities according to their virtual presence in relation to Factor 1 and 2. It clearly indicates that city size is not a significant factor on cities virtual presence. However, the virtual activities that relates to cities residence interaction are determinant factors in cities variations. The figure below indicate that cities that has high ranking scores in relation to Factor 1 in which Jubal tightly attached to highest score of factor 1.

This highlights the virtual cities equalities differ in the cyber space from the actual space. Various causes might lead to like distance viruses virtual interaction and cities human capital contrition to the web content. Despite the time limitation of this study, it shades light on new diminution in analyzing urban phenomena of actual cities from their virtual peripheries in the cyberspace.

	Component	
	1	2
AlJubail	.999	
AlBataliah	.994	
AlHalilah	.993	
AlKhubar	.993	
Anak	.978	
AlKhafji	.977	
UmAlHammam	.976	
AlMizalah	.972	
Tarout	-.961-	
AlQaismah	.959	
AlDammam	.954	
Safwa		-1.000-
AlNouria		-.969-
AlOmran		.967
AlHafouf		.951
AlMubaraz		.938
AlTaraf		.934
RasTanoura		.930
HafrAlBatin	-.478-	.878
AlDhahran	.507	.862
Abqaiq	-.518-	-.855-
AlQoudaih	-.579-	-.815-
Sehat	-.605-	-.796-
AlQatif	-.666-	-.746-
AlAwamiah	-.668-	-.745-
Extraction Method: Principal Component Analysis.		
Rotation converged in 3 iterations.		

Table 4.1 Cities Rotated Component Matrix

5 CONCLUSION

This study attempted to study the phenomena of virtual cities in the Eastern Province in Saudi Arabia by relating their population size to their presence on the cyberspace. We explored the virtual presence of cities in the cyber space to indicate the significance of their cyber presence in relation to their population size.

Factors related to residence interaction in the cyberspaces as substitution to the face-to-face physical interaction seem to be the main determent in cities virtual presence. The statistical analysis indicates that the hypothesis of population is a determinant variable in the virtual presence of cities due to the city residence contribution to the internet content is rejected.

The significance appears by the virtual activities of the city residence that relates to cities residence interaction are determinant factors in cities variations. This highlights the virtual cities equalities differ in the

cyber space from the actual space. Despite the time limitation of this study, it shades light on new diminution in analyzing urban phenomena of actual cities from their virtual peripheries in the cyberspace.

It is suggested that researchers start seeking new methods in analyzing cities on the regional level by measuring the residence physical activities in relation to their virtual activities. The virtual activities of cities residence can be used as enablers of development and should be leveraged as emerging resources in regional development.

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