# Evaluation of ICT development in Isfahan's region by Topsis method

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## Abstract

Information technology by removing the barriers and omitting geographical boundaries washes out the physical distances and dissolves many problems. But at the same time this concern is existed that information technology causes more separation between social classes and so creates a society that divides into two groups that one group is "possessed" and the other "do not possessed" the technology. Accordingly, one of the main challenging issues that social universe has encountered with, is inequality of information and communication technology indicators among regions, which called "digital gap". In order to achieve standard development and to provide geographical and spatial justice, removing the digital gap between regions, and equal and public accessibility of geographical units must be considered as the main priority of planning in field of ICT. The presented research by purpose of spatial analysis and ranking of counties in Isfahan province tries to improve information and communication technology and reduce digital gap. The research method is descriptive- analytic and for ranking and rate of difference among counties the Topsis algorithm is used. The results show that level of possessing ICT was not equal among counties in a way that counties divided into four groups of very high, medium, low and very low, that only the counties of Isfahan is located in very high group. The dispersal coefficient between counties is 5% that confirms the difference in spatial distribution of indicators. And also there is a direct relationship between development of ICT and population and urbanization percentage, in a way that most of facilities are located in a counties with high percentage of urbanization. At the end some solution is suggested in order to remove the digital gap between counties.

**Keywords:** information and communication technology, information society, development, digital gap, province of Isfahan

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## 1-Introduction:

### 1-1-Problem explanation:

Information and communication technology have created a new revolution which leads to new and considerable capacities in the area of human knowledge. (Sobhani and Giglou, :2 1384) and it has been accompanied with significant development among different countries. (Hanafizadeh and others142:1388) And as one of the most important strategic tools in valid management of human societies. (Albadavi and Ghapanchi 1386) Emphasize on importance of role of IT goes forward in a way that it is said that Information Technology and the ability in its application and adaptation is a very important element in creating wealth, power and knowledge. (Nouri 1389:2) so it is considered as an essential tool for economic activities that has numerous effects on economic variables such as growth, occupation, inflation, incomes, distribution of earnings and level of wages. (Eesa zadeh Roshan and Cheraghi1390:200) in development all aspects of human life like social, economical, political and cultural plays a role. (Kelles-Viitanen,2003) according to what is said the digital gap is one of the problems that presents in development of information technology. By development of information and communication technology a new kind of gap among different classes of people has been formed which called "digital gap". Because of the rapid distribution of internet in all over the world countries have encountered with this problem that if they don't recognize the digital gap in their own country or between their own country and other countries, they will be underdeveloped. Moreover the digital gap has this ability to increase the distance between regions and countries (international digital gap) or between citizens of a society (internal digital gap). (hanafizadeh and others, 142:1388) in fact it can be said that the digital gap refers to gap between those who are capable of using ICT and those who are not. (Adulis,2001,:2) therefore inequality and unbalanced distribution of services and facilities is the significant and evident feature of third world countries and Iran. (Ghaedrahmati and coworkers,1389:80) as the result of this inequality a limited number of regions have the main role and other regions just operated marginally. (Momeni and Saber, 1389 : 161) The presented investigation tries to express the situation of Isfahan province by considering the ICT indicators. Accordingly, it seems that the existed ICT facilities and services in province of Isfahan are distributed unequally. So by recognition of the existed digital gap among counties some strategies and planning should be applied to establish spatial justice. In this research by using the existed comparable indicators the status of ICT in counties of is under investigation.

### 1-2-The necessity and purpose of research:

In virtual age many of human communications is established based on information technology, and the physical presence has no meaning. All the world is integrated and everyone can communicates with each other and even transfer their emotions all over the world. (khanzadeh.1386:34) therefore by initial measurement we can provide a firm base for analyzing and reducing the digital gap. In order to compare the countries with each other and to measure the digital gap between them they should have agreement on a standard collection of IT indicators. Regarding the rapid growth of ICT, these indicators are essential for organizing policies and strategies. (hanafizadeh and others 1388:142) in Iran also, the concern for applying this technology for several years and some schedule is organized for distribution of this technology. (Tavakol and Qazi noori,1389:23) in order to control this sect and more serious application of ICT and for reaching to the aim of economical social and cultural development, more serious effort should be done.

(Hadili and Zeinali Azim, 1389:34) but by considering the role of ICT in achievement of deferent aspect of social, political, economical and etc, any effort in this field must be based on recognition of existed situation of ICT facilities and services in regions and toward reduction of digital gap in order to prevent unbalanced development. The purpose of this project is recognition and canalization of the ICT indicators and digital gap in the counties of Isfahan. And finally

by rating and ranking of counties we classify them for applying proper programming.

### 1-3-Research Methodology:

This research is applied- development and the method of research is descriptive- analytic. The population society includes 23 counties of Isfahan. 19 indicators in field of information and communication technology are gathered from 1390data calendar of Isfahan province. Then, the counties were investigated by applying Topsis algorithm and were ranked according to their level of development.

### 1-4-Research hypotheses:

These hypotheses are considered for this research:

-there is a meaningful relationship between the counties of Isfahan.

-considering ICT indicators, the counties of Isfahan are far from level of development.

-There is a relationship between urbanity rate and possession of ICT in counties of Isfahan.

### 1-5-Research Variables and Indicators:

In different sources, various kinds of indicators in field of information technology are presented for explanation of development rate. It is obvious that applying all indicators, because of inaccessibility or deficiency is impossible. Accordingly it is trying to use outmost of accessible and valid indicators which are mentioning in the context of presented paper.

### 1-6-Realm of the research:

The province of Isfahan is located in the center of Iran. According to 1390 census the population of the province was 4879312 and contains 23 counties. (public census, 1390)

## 2-Theoretical principle:

### 2-1-Information and communication technology

In recent fifty years, appearance of widespread changes in field of computer and communication has been accompanied with significant changes in deferent areas of human life. (Badraghe, 1385:4) From the second half of twenty century, the world has come into new era. The rapid scientific changes and technologies in field of transistors were the stimulant motor of this evolution. (Najjarzadeh and coworkers 1386:51) From the end of 1950, planners try to improve their efficiency by developing and applying computer models, information systems and supporting decision systems. (Taqvaii and Akbari1389: 29) ICT is a branch of technology that by using software, hardware, network, and data analysis leads to achievement, storage, exchange and control of information. (Fathian, 1385:71) The international union of information technology and services defines information technology as combination of software industries of administrative machines, data processing equipments, data communicative equipments, services and hardware. (Mahmoodzadeh and Razzaqi, 1387:2) Regardless of various definition of information technology and its wide domain of application in different levels of life, quick access to information and accomplishment of works without considering geographical distances and time limitations, is the main achievement of this technology. (Yousofi, 1386:2)

### 2-2-Digital Gap:

Information and communication technology as the pivot of development can be both a factor for inequality increase, unbalances and spatial and geographical injustices, and a factor for their reduction. In the eight line of political part of Tunisia commitment it is mention that: we all confess that although ICT revolution can have immense positive effects an equipment for sustainable development, without a capacitate space in national and international level it can strengthen the existed social and economical divisions and leads to extention of digital gap between poor and wealthy countries. (Saqafi and Zareei, 1386:1) Alongside with distribution of ICT in one geographical realm, the parts that possess higher software and hardware substructures can reach to more information with higher speed. Thereupon, knowledge and information gap among different regions in geographical realm will increase. (Fazelnia and Kiani, 1382) the present condition of ICT in the world shows unbalanced utilization of this technology. This uncoordinated and imbalanced situation is seen in most parts of the world and digital gap is one

of its consequences. (Hanifi and coworkers, 1386:9) the digital gap is predicted to the existed gap between those who have to access to information and communication technology and those who don't. (Kanjari Aalam and Kiani, 1386:5) it is defined in the 1998 for the first time from commercial department of America. (Kubicek, 2002)

Library union of America defines digital gap in this way: digital gap means the difference in accessibility to information, internet network and other related technologies by considering social class, sexuality, geographical situation, economical ability, knowledge and possibility of applying information. (Yazdanpanah and Mostajeran1387:100) digital gap has different social economical and political aspects that each of them is effectual on citizens accessibility

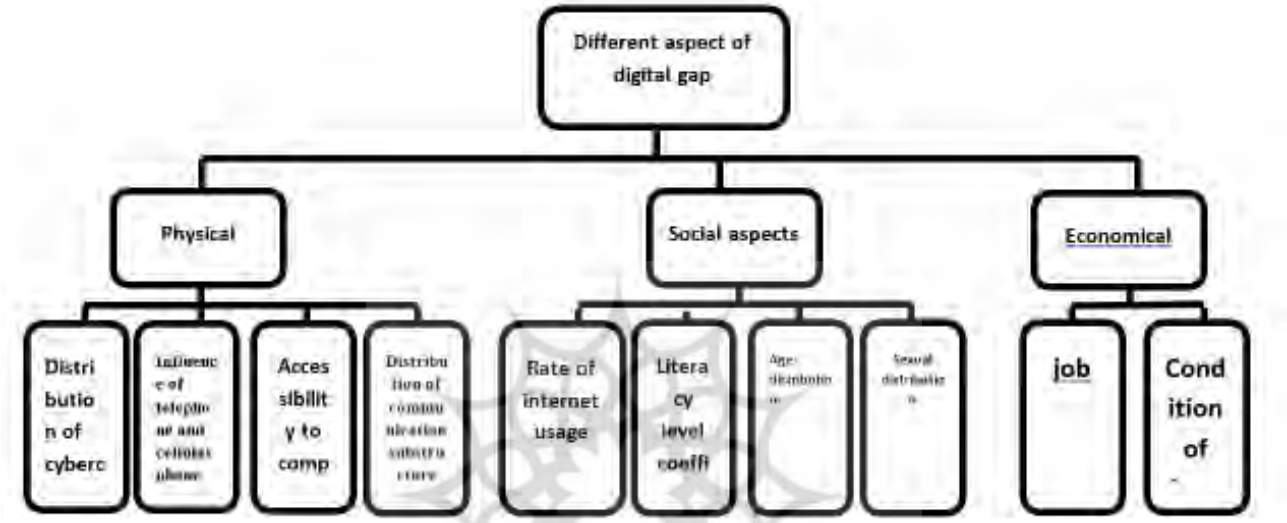
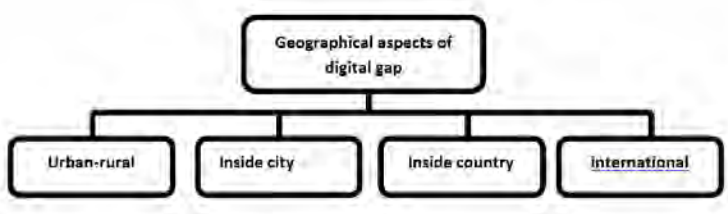



Figure 1- different aspects of digital gap

to ICT. (Hanifi and coworkers, 1386:8)

from the geographical viewpoint, the notion of digital gap is discussed from international, urban and rural aspects. (Hanifi and coworkers, 1386:2) Technological gap and knowledge gap cause this problem that one part of world are rapidly improved and other parts remain underdeveloped. (Memarnejad and Dizaji1389:184) Therefore, countries are encounter with this threat that if they don't recognize the digital gap inside their country or between countries they would fall in to underdevelopment. (Hanafizadeh and coworkers, 1386:22) Documents of Information Society Unions show that this union is looking for accessing to information and communication sources for every one, every time and every where, with equal conditions, in other word the purpose of this organization is to achieve recognition of information society, its advantages and disadvantages, and also to find proper solutions for reducing or omitting digital gap in the world, specially between developed countries and developing countries. (Riahi vafa and Hedayati, 1385:4) Regarding this problem most of the countries try to improve their situation and social condition by using this technology. (Riahivafa and Hedayati, 1385:4) the government is responsible for removing digital gaps in national level (Khanjari Aalam ad Kiani,1386:5) and by proper planning and investment the existed digital gap must be reduced.



(Qaderi and Amiri, 1386)

**2-3-Introducing model of Topsis:**

The Technique for Order of Preference by Similarity to Ideal Solution (TOPSIS) is a multi-criteria decision analysis method, which was originally developed by Hwang and Yoon in 1981(Hwang and Yoon,1981) with further developments by Yoon in 1987, (Yoon, 1987: pp.277–286) and Hwang, Lai and Liu in 1993. (Hwang, et al, 1993: pp.889–899) TOPSIS is based on the concept that the chosen alternative should have the shortest geometric distance from the positive ideal solution and the longest geometric distance from the negative ideal solution. It is a method of compensatory aggregation that compares a set of alternatives by identifying weights for each criterion, normalising scores for each criterion and calculating the geometric distance between each alternative and the ideal alternative, which is the best score in each criterion. An assumption of TOPSIS is that the criteria are monotonically increasing or decreasing. Normalisation is usually required as the parameters or criteria are often of incongruous dimensions in multi-criteria problems.(Yoon and Hwang, 1995) (Zavadskas, et al, 2006: pp.601–618) Compensatory methods such as TOPSIS allow trade-offs between criteria, where a poor result in one criterion can be negated by a good result in another criterion. This provides a more realistic form of modelling than non-compensatory methods, which include or exclude alternative solutions based on hard cut-offs. (Greene, et al, 2011: pp.412–432)

The TOPSIS process is carried out as follows:

**Step 1**

Create an evaluation matrix consisting of m alternatives and n criteria, with the intersection of each alternative and criteria given as $x_{ij}$ , we therefore have a matrix $(x_{ij})_{m\times n}$ .

**Step 2**

The matrix $(x_{ij})_{m\times n}$ is then normalised to form the matrix

$R = (r_{ij})_{m\times n}$, using the normalisation method $r_{ij} = x_{ij}/pmax(v_j), i = 1, 2, ..., m, j = 1, 2, ..., n,$

where is the maximum possible value of the indicator $v_j, j = 1, 2, ..., n$ .

**Step 3**

Calculate the weighted normalised decision matrix $T = (t_{ij})_{m\times n} = (w_j r_{ij})_{m\times n}, i = 1, 2, ..., m$

Where $T = (t_{ij})_{m\times n} = (w_j r_{ij})_{m\times n}, i = 1$

so that $\sum_{j=1}^{n} w_j = 1$ , and $W_j$ is the original

weight given to the indicator $v_j, j = 1, 2, ..., n$.

**Step 4**

Determine the worst alternative $(A_w)$ and the best alternative $(A_b)$:

$A_w = \{\langle max(t_{ij}|i = 1, 2, ..., m)|j \in J_-\rangle, \langle min($

$in(t_{ij}|i = 1, 2, ..., m)|j \in J_+)\} \equiv \{t_{wj}|j = 1, 2, ..., n\},$

where, $J_+ = \{j = 1, 2, ..., n|j$ associated with the criteria having a positive impact,

and $J_- = \{j = 1, 2, ..., n|j$ associated with the criteria having a negative impact.

**Step 5**

Calculate the L2-distance between the target alternative and the worst condition $A_w$

$$d_{iw} = \sqrt{\sum_{j=1}^{n}(t_{ij} - t_{wj})^2}, i = 1, 2, ..., m$$

and the distance between the alternative and the best condition $A_b$

$$d_{ib} = \sqrt{\sum_{j=1}^{n}(t_{ij} - t_{bj})^2}, i = 1, 2, ..., m$$

and the distance between the alternative and the best condition $A_b$

$$d_{ib} = \sqrt{\sum_{j=1}^{n}(t_{ij} - t_{bj})^2}, i = 1, 2, ..., m$$

where $d_{iw}$ and $d_{ib}$ are L2-norm distances from the target alternative $i$ to the worst and best conditions, respectively.

**Step 6**

Calculate the similarity to the worst condition:
$s_{iw} = d_{ib}/(d_{iw} + d_{ib}), 0 \leq s_{iw} \leq 1, i = 1, 2, ..., m$

$s_{iw} = 1$ if and only if the alternative solution has the worst condition; and
$s_{iw} = 0$ if and only if the alternative solution has the best condition.

**Step 7**

Rank the alternatives according to
$s_{iw}(i = 1, 2, ..., m)$

**4-Outcomes of research:**

In the presented research, we use 19 ICT indicators. According to this notion that in research process, weight of indicators were not equal. The writers, by considering the importance of indicators, give a relative weight to each of them and after providing indicators and initial matrix of data we proceed standardization of rates of each indicator in amount of that indicators for all of the counties. Finally the standard matrix is organized and by continuing other steps of TOPSIS technique the development level of 23 counties of Isfahan is found and then the ranking of counties is done. The achieving result is presented in table 3.

| Rural Mailbox | Urban mailbox | Urban postal agency | ICT offices | Common offices of post and rural services | Rural postal agencies | Office Communication Services | Rural Post Office | Urban post office | Post office | Indicators |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | |
| Towns | | | | | | | | | | |
| 10 | 28 | 0 | 17 | 0 | 0 | 6 | 0 | 2 | 1 | Aranv-abidgol |
| 23 | 21 | 0 | 34 | 0 | 0 | 5 | 0 | 2 | 1 | Ardestan |
| 4 | 210 | 6 | 66 | 1 | 37 | 160 | 1 | 27 | 1 | Isfahan |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | Borkhar |
| 19 | 12 | 0 | 35 | 0 | 12 | 2 | 0 | 0 | 1 | Tiranva-karvan |
| 10 | 9 | 0 | 17 | 0 | 2 | 2 | 0 | 1 | 1 | chadegan |
| 7 | 7 | 0 | 6 | 0 | 1 | 26 | 0 | 1 | 1 | Khomein-ishahr |
| 10 | 8 | 0 | 10 | 0 | 0 | 2 | 0 | 0 | 1 | khansar |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | Khurvabi-abanak |
| 8 | 8 | 0 | 11 | 0 | 1 | 7 | 0 | 0 | 1 | Dehaghan |
| 9 | 10 | 0 | 17 | 2 | 8 | 2 | 0 | 0 | 1 | Semirom |
| 17 | 37 | 1 | 15 | 0 | 5 | 30 | 1 | 6 | 1 | Shahin-shahr and Meimeh |
| 5 | 24 | 0 | 12 | 0 | 1 | 16 | 0 | 0 | 1 | Shahreza |
| 10 | 12 | 0 | 25 | 0 | 22 | 4 | 0 | 1 | 1 | fereidan |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 13 | 9 | 0 | 16 | 10 | 1 | 1 | 0 | 0 | 1 | Fereidoun-shahr |
| 18 | 22 | 0 | 34 | 0 | 6 | 14 | 0 | 4 | 1 | Falavarjan |
| 24 | 55 | 2 | 41 | 0 | 12 | 16 | 0 | 2 | 1 | Kashan |
| 10 | 8 | 0 | 15 | 0 | 13 | 7 | 0 | 0 | 1 | Golpaigan |
| 14 | 16 | 0 | 21 | 0 | 12 | 19 | 0 | 6 | 1 | Lenjan |
| 13 | 30 | 0 | 12 | 0 | 3 | 14 | 0 | 0 | 1 | Mobarakeh |
| 48 | 26 | 0 | 24 | 0 | 5 | 4 | 0 | 2 | 1 | Naiin |
| 12 | 35 | 0 | 13 | 0 | 5 | 23 | 0 | 7 | 1 | Najafabad |

Table1- Indicators of Information Communication Technology, based on Statistical Yearbook 2011(1390).

| Indicators<br>Towns | Post office | Urban post office | Rural Post Office | Office Communication Services | Rural postal agencies | Common offices of post and rural services | ICT offices | Urban postal agency | Urban mailbox | Rural Mailbox |
|---|---|---|---|---|---|---|---|---|---|---|
| Aranv-abidgol | 397 | 50 | 45640 | 29775 | 5219 | 1136 | 27169 | 37/41 | 28/13 | 97409 |
| Ardestan | 261 | 164 | 32492 | 21311 | 1973 | 1234 | 18791 | 55/11 | 42/24 | 41405 |
| Isfahan | 6676 | 307 | 1306834 | 837426 | 156016 | 22591 | 2569774 | 46/04 | 116/46 | 2174172 |
| Borkhar | 191 | 15 | 52190 | 32171 | 4941 | 804 | 25601 | 35/31 | 23/84 | 108933 |
| Tiranva-karvan | 254 | 50 | 33581 | 24560 | 2110 | 712 | 23226 | 43/85 | 37/19 | 69047 |
| chadegan | 136 | 64 | 15852 | 7980 | 652 | 1009 | 6460 | 30/22 | 20/25 | 33942 |
| Khomein-ishahr | 546 | 9 | 119363 | 91673 | 13871 | 2224 | 104866 | 34/54 | 33/61 | 311629 |
| khansar | 186 | 23 | 17575 | 12745 | 1419 | 661 | 53213 | 48/42 | 173/81 | 32423 |
| Khurvabi-abanak | 84 | 29 | 13780 | 10933 | 587 | 512 | 5082 | 67/05 | 28/32 | 17793 |
| Dehaghan | 141 | 17 | 16354 | 13195 | 370 | 406 | 12073 | 40/13 | 34/68 | 34844 |
| Semirom | 150 | 132 | 29166 | 19627 | 1226 | 1242 | 19340 | 28/52 | 24/96 | 65047 |
| Shahinshahr and Meimeh | 792 | 58 | 107192 | 65287 | 11110 | 3579 | 92070 | 38/56 | 44/39 | 196584 |
| Shahreza | 386 | 35 | 76256 | 52013 | 7848 | 1026 | 110724 | 39/97 | 72/69 | 149555 |
| fereidan | 264 | 76 | 28520 | 21523 | 694 | 766 | 27819 | 29/38 | 35/63 | 79743 |
| Fereidoun-shahr | 143 | 75 | 17065 | 11566 | 250 | 545 | 9877 | 33/2 | 26/53 | 38334 |
| Falavarjan | 365 | 65 | 102218 | 71437 | 7939 | 1332 | 73489 | 32/94 | 30 | 247014 |
| Kashan | 958 | 81 | 193702 | 125426 | 17996 | 2508 | 137237 | 44/38 | 41/73 | 323371 |
| Golpaigan | 285 | 62 | 50170 | 33935 | 3517 | 1170 | 36382 | 44/63 | 42/04 | 87479 |
| Lenjan | 694 | 55 | 115149 | 80895 | 6462 | 2092 | 115746 | 37/71 | 48/8 | 246510 |
| Mobarakeh | 371 | 57 | 73328 | 47371 | 6600 | 1437 | 58599 | 38/68 | 40/9 | 143474 |
| Naiin | 225 | 192 | 26258 | 16447 | 2013 | 997 | 54396 | 50/25 | 140/48 | 38077 |
| Najafabad | 717 | 41 | 150041 | 93961 | 14999 | 1561 | 164988 | 36/33 | 54/24 | 300288 |

Table2- the remainder of Indicators of Information Communication Technology, based on Statistical Yearbook 2011(1390)

| row | Counties name | Topsis score | rank |
|---|---|---|---|
| 1 | Aran va Bidgol | .232446 | 18 |
| 2 | Ardestan | .270145 | 9 |
| 3 | Isfahan | .718022 | 1 |
| 4 | Borkhar | .256765/0 | 12 |
| 5 | Tiran va Karvan | .289581 | 5 |
| 6 | Chadeqan | .178024 | 20 |
| 7 | Khominishahr | .324124 | 3 |
| 8 | Khansar | .24631 | 15 |
| 9 | Khuor va Biabanak | .133759 | 23 |
| 10 | Deaghan | .246763 | 14 |
| 11 | Semirom | .254563 | 13 |
| 12 | Shahinshahr and Meimeh | .187901 | 19 |
| 13 | Shahreza | .264683 | 10 |
| 14 | Fereidan | .136523 | 22 |
| 15 | Fereidounshahr | .146278 | 21 |
| 16 | Felavarjan | .23411 | 17 |
| 17 | Kashan | .276524 | 8 |
| 18 | Golpaygan | .244420 | 16 |
| 19 | Lenjan | .287593 | 6 |
| 20 | Mobarake | .26354 | 11 |
| 21 | Naiin | .282301 | 7 |
| 22 | Najafabad | .329556 | 2 |
| 23 | Natanz | .314745 | 4 |
|  | CV | .5 |  |

Table3- ranking of counties of Isfahan according to ICT indicators using TOPSIS model.

Considering the results of table, we can evaluate the difference between counties regarding their possession of ICT indicators. According to the TOPSIS score 3 first counties of Isfahan, Najafabad and Khomeinishahr were in order: 0/718022, 0/329556, 0/324124 and 3 last counties of Khourvabiabanak, Fereydan and Fereydounshahr were in order 0/133759, 0/136523, 146278.by comparing the counties we see a tremendous variance among them which indicates the existed digital gap. For example the difference between Isfahan as the first county and Kourvabiabanak as the last one is 58% and between Najafabad as the second county from above and Fereydan as the second county from below is 19%. It shows that Isfahan county by higher weight in possessing ICT indicators causes the inequality and gap in this province. After achieving final scores and determination of rates of the counties we ranked them according to TOPSIS scores. The Sturges formula is used for ranking that is in this way:

$$i=R/((1+3.3\ \log N)\ )$$

in this equation i = class distance N= the number of counties R= domain R= max – min (that is the difference between highest score and the lowest one). The outcome of this formula is based on TOPSIS scores that classified the counties of Isfahan province in five level of: very high, high, medium, low and very low.

Table4- ranking of counties of Isfahan according to Topsis score

| row | level | Counties | number | Development level |
|---|---|---|---|---|
| 1 | Level1 | Isfahan | 1 | Very high |
| 3 | Level2 | Khomeinishahr, Najafabad, Natanz | 3 | medium |
| 4 | Level3 | Tiranvakarvan, Lenjan, Naiin, Kashan, Ardestan, Shahreza | 6 | low |
| 5 | Level4 | Mobarakeh, Borkhar, Semirom, Dehaghan, khansar, Golpaigan, Falavar-jan, Aranvabidgol, Shahinshahr and Meimeh, chadegan, Fereidounshahr, fereidan, Khurvabi-abanak | 13 | Very low |
| sum | | | 23 | - |

Table4- ranking of counties of Isfahan according to Topsis score

## 5-Conclusion:

Today in the information age, ICT has been considered as the most important factor for development. Therefore the determination and interpretation of causes of development is considered as one of the serious challenges. In the present research, based on ICT indicators and application of TOPSIS techniques, dispersal coefficient and Pearson correlation we pay to ranking of 23 counties of Isfahan in 4 levels. The outcomes show that there is a high variance between counties in possessing ICT indicators in a way that Isfahan with a very high variance allocates the first rate to itself. According to the results the counties have distance with development level in a way that 13 counties are located in very low group. And also there is a relationship between percentage of urbanity and possessing of ICT indicators.It means that the more the percentage of urbanity was, the more the possession of indicators been. So to reduce the level of digital gap and providing equivalence and order among regions some solution is recommended.

## 6-Suggestions:

The presented article pays to ranking the counties of Isfahan by consideration of 19 ICT indicators. The results show that there is a kind of divergencey and disparity in the spatial system of Isfahan. So it is necessary to pursue some effective programs to achieve development and root out the deprivations.

-The counties which are located in low or very low level should have been in the first priority of plans, so these counties requires quick and short-term programs.

-For the medium counties some intermediate program is recommended.

-For the high and very high counties long-term program is recommended.

-In order to remove the difference between urban and rural points and reinforcement of urban and rural cybernetic communication, villages also should have been equipped with ICT. And instruction of rural in this field and increasment of their knowledge of ICT and its advantages is essential.

-Equipment of organizations and administrations for electronic urban management, in order to offer more services to citizens.

-Reinforcement and actualizing concepts like electronic government and besides that electronic city, electronic village to prevent waste of costs and time.

-Increasing of Internet workshops especially cybercafés in this province.

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