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# THE IMPACT OF GEOMETRICAL CHARACTERISTICS OF MOVEMENT AXES ON THE PLACE ENERGY

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## ABSTRACT

*The energy considered as most important appearances which filled the nature and flow around our bodies and inside it. The energy is the power of life so it were associated with all the places that is related with the habitation and life.*

*We couldn't observe the energy of the place but we can fell it by its effects on our life and its appearances if it came from the natural environment or create by spatial organization. literatures differs in dealing with concept of the place energy ,some of these literatures focusing on the social interactions and its effect on the place and others were focusing on the urban systems and the visual forms energy .*

*Literature review showed that the Feng shui philosophy taking this matter in consideration by organize the place resources, its characteristics and how to use the movement axis to increase the active energy (Sheng chi). The research problem was ((that, There is a knowledge gap about the effect of the geometrical characteristics of movement axes on the place energy)) so that the goal of the paper is to build a Theoretical frame work to explain and measure the impact of geometrical characteristics of movement axes on the place energy.*

*The research found that geometrical characteristics of the movement axes and movement nodes have a very big effect on the place energy specially the length and angles of the movement axes and the position of these axes from the city center.*

**Key words:** Energy, place, Movement axes, Geometrical Characteristics.

**Cite this Article:** Shaymaa Fadhil AlKubaissy, Dr. Sana Sati Abass, The Impact of Geometrical Characteristics of Movement Axes on the Place Energy. *International Journal of Civil Engineering and Technology*, 8(8), 2017, pp. 1681–1691.

<http://www.iaeme.com/IJCIET/issues.asp?JType=IJCIET&VType=8&IType=8>

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## 1. INTRODUCTION

The energy is defined as the potential power, also it is the hard work done by the human being. The energy in Philosophy have two meaning ,the first one is Psychological ,and the second is philosophical and physical meaning . The Psychological one means the capacity to give effort with power, while the physical meaning , means the ability to produce a mechanical work by one or many bodies .Energy have two images, the first one is the motion energy ,and the second is the potential energy .(Sleba,1982,p8) Energy in Architecture refer to everything connected to the mass and movement ,so that it is potential or motion ,according to the balanced powers states ,which reflects on design ,architectural composition of forms and masses. So, the potential energy represented by lines ,surfaces ,grids which is an expression of structural stability And architectural composition . while the motion energy represented by the curved and zigzag lines and surfaces which are used in many architectural forms and compositions.(Shirzad,1985,pp207-211). The place energy from Fing-Shui view is the important appearance of life, it include everything that related with Feng-Shui , so it is the energy and power which moves around bodies.it can't be registered by our senses because it is obvious through its effects and generated by suitable environment or created by ordered spaces and the air entered with in it freely. The researcher showed the elements that liberate the (chi) ,the energy from the Feng-Shui point as the following:- Paths , 2- Windows and openings , 3- Spacious places , 4- lights , 5- circles and curve lines , 6- sensitive materials to the winds and air movement.(widera,2005,p5).

The place power is effected by paths which contain it and their characteristics , so the research problem is that (Their a knowledge gap about the effect of geometrical characteristics of movement axes on the place energy.) so the research hypothesis is (the geometrical characteristics of movement axes have an effect on the place energy.),the aim of this paper is to build a theoretical framework for the geometrical characteristics of movement axes effects , and the research methodology will be :-

- Build the theoretical framework for places energy and its characteristics .
- Build a scale to measure the movement axes .
- Apply the theoretical framework and measurement of Erbil city.
- discuss a results and conclusion.

## 2. ENERGY

The Feng-Shui is classified energy into three types:- 1- Sheng chi, 2- Si chi, 3- Sha chi.Sheng chi means upper movement ,it is a positive power exists in shiny, Fresh, higher places and moves incurved lines. Si chi have a negative effects is found in random places and it's not organized places and polluted .Sha chi this power came from negative context ,its negative power ,harmful ,and moves in straight lines which consumed a human being power ,so man feel tired in these places .This type of power found as a result of existing wires which cuts the visual axes ,also its found near noisy buildings as the fire station or bus terminals and graveyards also near sharp cantilevers and narrow angles. ( widera,2005,p37)

## 3. METHOD OF MEASURING ENERGY ACCORDING TO FENG-SHUI PHILOSOPHY

There is three methods for measuring energy according to feng-shui :-

- The form school method
- The lu shue square
- The five elements method

### 3.1. The form School Method

This method depends on five element which have principles through which we could find standards for friendly environment design and a planning view have a thoughtful considerations and relationships With architecture and environment ,these principles are:- (Mak,2009,p135).

- The dragon which represent the topography.
- The sand which represent the surrounding environment.
- The water flow throw the site and surrounding buildings .
- The cave which mean the residence location .
- The direction which means the site elevations.

### 3.2. The Lu Sh Square

It is a grid of nine square (3\*3),each one has a number significant and direction of the eight direction of the eight direction determined by the (Ba Gua) compass. Also each square has an element of the five elements, a form and special colure.(fig-1) &(table-1).

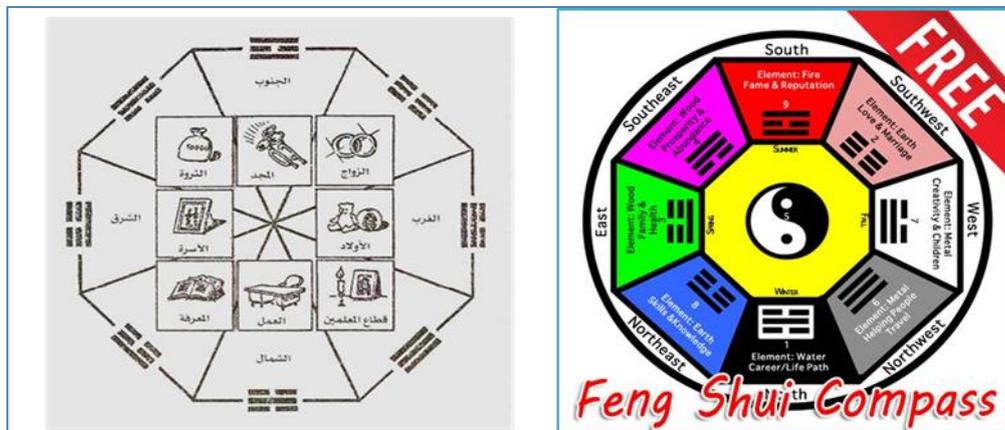


Figure 1 Feng Shui compass & Lu square( Semnova,2008,p77)

Table 1 The suitable colure, shape and direction for each elements of the five elements (Semenova,2008,p.15)

The Element Form	The Element orientation	The Element color	The Element Image	The Element
Rectangle	East-south east	Green-light blue	Dragon	Wood
Triangle	South	Red-Purple	The Phoenix	Fire
Square	Center-north west -South east .	Yellow	the emperor	Earth
Circle	West-North west	White-Metallic	Tiger	Metal
Waves	North	Black-Dark blue	Turtle	Water

## 4. LITERATURE REVIEW OF PLACE ENERGY

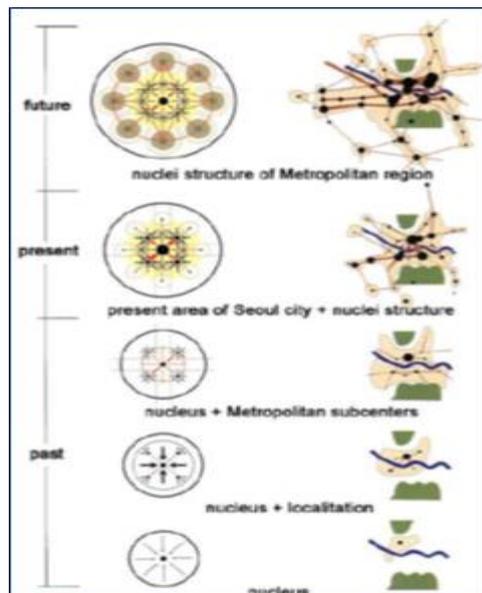
### 4.1. Sun-Kee Hong, Feng-Shui Theory in Urban Landscape, 2006.

The Paper discussed Thoughts and methods for ecological planning of urban spaces from Feng-shui points of view according to traditional use types ,which is limited by practice and traditional evaluation .

The researcher showed that the place configuration of urban spaces results from the accumulated interactions between the human activities and the physical environment .The traditional philosophy have an important effect on planning and urban development in the east of Asia in general and spatially Seoul, So that the traditional practice of use built on the Feng shui principles which effect on the urban types of human uses also its role in the social and economic background development.

- The Feng shui concept built on the transactional perception of the natural urban spaces so it is necessary to find a new model for urban spaces planning in order to maintain the urban integration of urban spaces in Seoul.
- The research conclude that the sustainability of urban spaces must develop a new theoretical framework built on the principle of integration between the urban spaces ecology as the Feng shui thought.
- The researcher compare between the urban spaces design and ecological urban spaces depending on the principles of Feng shui such as :-
  - Place topography for example mountain ,valley or river .
  - Communication appreciation mountain shape evaluation in relationship with region .
  - The importance of suitable place.
  - The organization of water, energy, organic material source exist in the site.
  - The organization of orientation .
  - Urban type and landscape aspects .
  - Collecting perception of land nature that based on cognition.

The paper showed that the Feng shui principles can be harmonized with the new development of Seoul city and how to improve the work performance in urban spaces in Seoul.



**Figure 2** The stages of design cores and spaces in Seoul city in past &the new proposal (Sun-Kee,2007,p233)

The researcher mentioned the importance sounds energy as a positive one ,and its increased the chi positive energy , as well as the harmony between the mountains and springs

which increase the vitality of the place design ,and urban spaces ,those effects the ecological functions of spatial urban design .Also the paper mentioned the thoughts of Feng shui had a great effect on the reclamation of natural environment in spatial organization with in cities, and they are fit with the new ecological Theories. The researcher suggested to create an urban landscape which contains high ecological and functional integration and a strong network between cities cores by suitable urban spaces ,this connectivity will minimize the conflict on the resources ,and to create these spaces parallel with the river and connected with it because it will enhance the river and its positive energy in addition to respect the traditions and social privacy of each place and city.(Sun-kee,2006,p236)

The study showed the importance of the FengShui philosophy and its effect on elements on the city development .The researcher give some elements of measurement such as:

- Topography physical environment.
- elements of climate depends on locality of surrounding
- Syntactical elements deals with Urban spaces location, and their connectivity with communication grid.
- perceptual elements deals with nature of urban environment perception .
- Elements deals with location and direction .

#### **4.2. Al-sadkhan, Areej Abdulkareem & Hatim, Lina Odai,2013,The application of Feng shui in design of contemporary architecture and its environment**

The paper discussed the natural components and their effect on urban environment and man-made , from the feng shui point of view in order to reach to better situation for the city development and building construction .It's a practical style design to reach to right place through suitable and good orientation , good form , proportion and there organization in good way for a better urban environment design .This method take the local , geographical and topographic aspect in addition to circumstances of living and traditional of people and technical experience in construction .

The case study was the residential building Haifa Street– BAGHDAD City. the paper discussed the relationship between this project with the whole site and its relationship with surroundings ,and some global area characteristics also the paper showed the effect of transformation and a system of roads that lead to this style of design and its relationship , in addition to discussing the height of building according to feng shui principles to reach sustainability . at the end of research the researchers suggest proposals to the performance of buildings shape according to the feng shui principles .

The researchers divided there concept according to feng shui principles and there concept

- Principle of integrity.
- Principle of Adoption.
- Principle of geological and hydrological preference.
- Principle of eclecticism.
- Principle of balance.

The paper showed that analysis site will be according to many factors such as:-

- The power: it mean the features of site and its perceptual effect like the river or the mountain ,it gives power to the nods of site or to the edge of the site.

- The shape: how to be understood.
- The structure: The relationship between geography and built environment.
- The circumstances: explain the relationship between the buildings that near the site.

As the result of the paper, The Feng Shui concept in general divided according to the researcher view. Their wasn't practical measurement for evaluation, Feng Shui have five principles but the paper add a new conceptual framework.

#### **4.3. Abdul-Hameid, Nasir Nadhum , 2010, The Place Energy and Man in Architecture**

The paper study the place energy , man and architecture in three lines :

- The Feng shui philosophy and its measurements.
- How to apply this philosophy in Interior design of houses.
- The elements that effect on the city energy.

The paper discussed morphological form of the city such as ( squares , circles, rectangle ,and so on) And showed that the square or rectangle shape isn't stabled form for energy because this structure is quickly effected by external energy , also the wide street don't have special center for it so cities that built on the shape of squared effected by the surrounding areas and more calm for energy. In square city in corners and neighborhood near the suburbs had more stable energy than the big streets because the flow of energy in cities moves naturally in streets . So the energy in suburbs does not penetrate walls of houses easily and it will directed toward city (Abdul-Hameid,2010,p80-83) . The circle forms if the city planning is more stable for energy from the point of view of Feng Shui because all the street and roads will meet in city square , but the energy current comes from suburbs will weaken the power in circle street from the mutual effect of energies .stable structure for energy will formalize in the center of the city and the changes in such a city will be so little . The third type of strip cities or elapse cities witch is parallel to rivers or rail way lines . the realm of energy of this cities is more than other forms but the shortage of energy in the wide roots that take the energy and lose it quickly and can't keep it for a long time . Therefore the flow of energy in the city look like its movement in the wide streets . The energy receipt by crescent cities is stable and fixed but its effected buy external effect . while the energy moved out of the cities is weak and unstable . The neighborhoods far from the city center more calm from the point of formalize cities because it was received current of energy from external and internal areas (Abdul-Hameid,2010,p82) .

As a result from the paper according to the physical , the research divided the environment according to morphological shape because it discuss the shape of the city , types of street planning the location and position and the relationships that connect them also the research discuss the type of cities according to design type and design age and the land marks inside the city . so from the literature review the energy had been treated in different views , the first one according to balanced living types with environment , as Feng Shui and a s shownen ( sun-kee,2007) ,(Al-Sadkhan & Hatim, 2009)and (Nadim,2010).Table (2) showed the theoretical framework for place energy.

**Table 2** The place energy theoretical framework source:(the researchers)

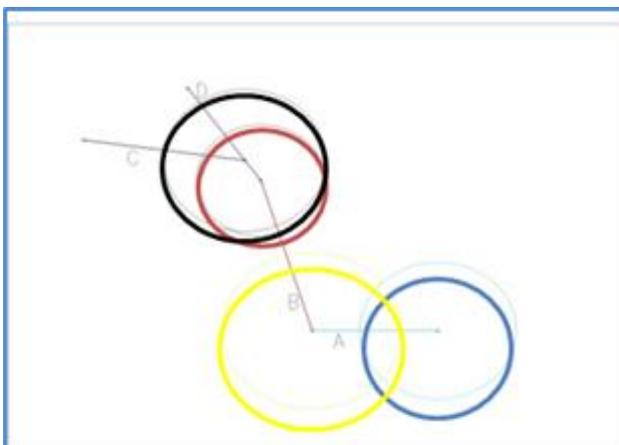
Possible Values	Secondary Elements	Main Elements	The Energy
Positive energy	Sheng Chi	Energy types	
Negative energy	Si Chi		
Negative energy	Sha Chi		
As result of form or design	Morphological	The reasons of energy	
As result of air movement or water movement	Movement		
As result of Topography type	Geographical		
The type of material like air , water , earth, fire, metal	Compositional		
Bagua Square five elements		The measurement Of place energy	
The Form School Principles			
Feeling of rest ,satisfaction		The indicators of	
Social interaction with place &pepole		Positive energy	

### 5. PRACTICAL STUDY

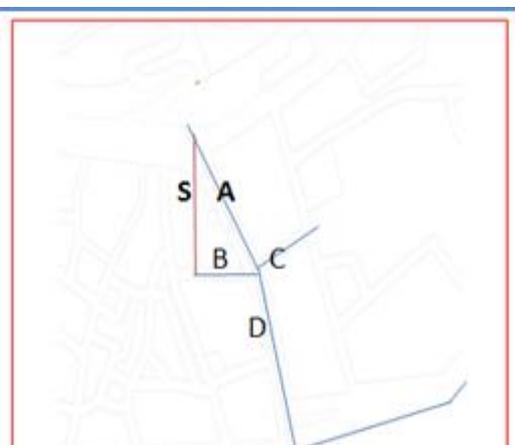
Practical study will done by the drawing of urban area using Auto cad program ,then drawing the movement axes, and energy circle:

#### 5.1. The Movement Axes Measurement

(Unwin, 2005) mention that the movement axis giving energy through people movement in it and there nearest from land marks witch has a present circle covers big area (from the surrounding Unwin,2005,p99) also Morin and Josif,2002 mentioned that the streets witch has a zigzag forms it keep more energy the straight one ,while (Al-Imam,2002) Showed that streets Lose energy As long as were long and wide Because the energy is carried out quickly for it passed through them . the energy loses part of it in the joint places. And specially in the point of the direction change and this is called the initial energy its represent the zero time of situation that before reach it . this happened in the point of the connection between tow movement axis as the energy circle increased , the energy if the axis will be more . (Fig-3)



**Figure 3** Drawing the energy access where the radius of the circle will be multiplied by the movement axis energy divided by time needed to reach a special point equal to the law of movement axis energy (source the researchers)



**Figure 4** Showed the integration of movement axis where (A,B,C,D,E,F) is the movement axis while = (The sum of distance between A , B ) ( Source : the researchers )

Because the definitions of energy is the ( power to do something and it has many images , some of them potential , other is obvious . Feeling of energy is differed according to perception ) so the movement axis energy will be measured according to power law in physics by Newton: power ability = Force X Distance /Time it was measured by (watt)it defined as a power that needed to complete one (Jul) of work Through period of time like one second or one mint .(Al-Khateeb and KHeralla,2009,p132).Because we measure the energy of the movement axis ,we must know the source of the movement axis power . In the urban environment the power & movement axis come from the spatial and geometric characteristics so this power comes from the people moving through them.(salingaros&mor,2000).

The power of movement axis come from the differences in its characteristic ,,whatever this characteristic syntactic, geometric or functional divided by the distance for this difference the characteristics measures (Fig4) (Salingaros,2002,291).

$$F=du/dr$$

F= Characteristics Power

du=The difference of characteristics value

dr= The distances which measures this differences from a spatial point .

As an example if we if we take the value of integration power for the axis A=(the integration value of Axis A-integration value of axis B/ distance from specific point to these axis (s). this will be done to all axis's So the law of energy movement axis will be : ( the energy of movement axis = power x distance / the duration time needed to reach from special point for this axis )

So the energy of movement axis = power of movement axis characteristics x the radius of power circle / duration time needed to movement to a special point to the movement axis . (source the researchers)so the power the movement axis will measured for the integration core of the city , and calculate its distance from the needed center , and according to it , other axis are constructed , then calculate the geometrical characteristics such as length of movement axis , and find its effects later .

## 5.2. The Study Sample Determination

Erbil city was chosen as a sample witch has a special characteristic design . It's the main traditional historical center the oldest settlement witch had conserved its physical structure as a comparison between the stages of the city life as the change of city parts.



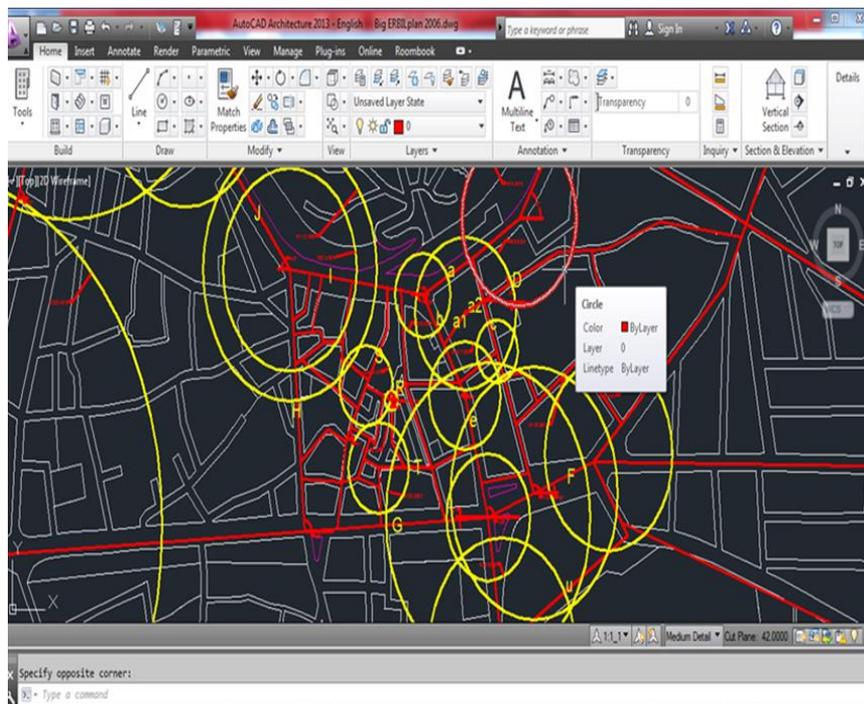
**Figure 5** Represent the area of the case study source: Google Earth.

The reason for choosing Erbil (city as a case study):

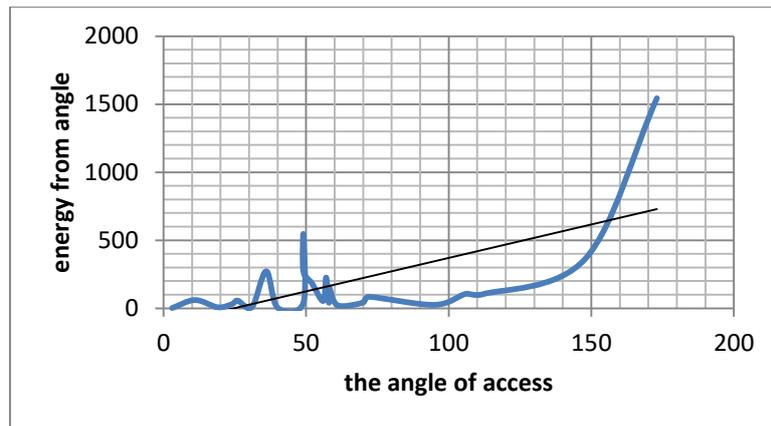
- it verified a theoretical framework of the paper because the nature of the city and its growth .
- So the historical castle and its surroundings to the third ring of ring streets around the castle witch is named by (sixty street ) .
- it's the oldest city conserved its structure, on the level of architectural details and urban characteristic .
- the city is the vital core of Erbil city .

## 6. THE DISCUSSION OF RESULT

- The paper found a strong positive relationship between the movement axis angles and the energy of the axis . the highest value of the movement axis energy is ( 546.5 ) this value came from the deviation of angles . person value was ( + 0.67) this value came from the relationship between the movement axis energy value and the movement axis deviation . this means that the power of movement axis increase as it deviated from the main axis .
- A Strong positive relationship is found between a high value of the energy circle radius and the movement axis energy with (+0.62 percent value ) . the highest axis energy value was (1656.6) and highest radius of energy circle was (480.7m). this means that the movement axis energy increase with increasing energy circle .
- The movement axis location as the movement axis nearer of the city center , its energy will be increased . person value was (+0.655) this gives an indicator that the location of movement axis of the city is important also the importance of its location near the land marks of the city .



**Figure 6** Drawing of the urban nodes energy & the energy circles for each movement axis .(source: the researchers.)



**Figure 7** The relationship between the movement axis deviation and its energy (source: the results of case study)

## 7. CONCLUSIONS

- The movement axis energy is increased Through the location of these axis from the city center ,and nearest the landmarks .
- The movement axis energy is increased by the movement axis deviation value from main axis ,and through the increasing of the radius of energy circle.
- The place energy increased as the geometrical characteristics value are increased, this will effect on the (movement axis energy)in different proportion .the highest effect is in the movement axis angles deviation ,then its length ,and its location to the city center and landmarks.

## ACKNOWLEDGMENT

The authors would like to acknowledge Koya University and (MHE) of Kurdistan Regional Government (KRG) for support given to this research.

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