



Review on wayfinding performance by identification key factors influence

Mahdie KARIMI¹, Ali EMAMI^{1,*}

¹*Department of Architecture, Gonbad kavoos Branch, Islamic Azad University, Gonbad kavoos, Iran*

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Abstract. An environment of understanding means that how to collect, store and process an information about the physical environment around us. Process and categories to recognize individuals successful in the environment and wayfinding, It is challenging. This article reviews the literature on important issues in wayfinding them; This article main theorists, Lynch, Kaplan and Pasini beginning stages of formation and development of wayfinding and analysis put forward their ideas and then wayfinding to the new research focuses on different issues. The main working paper focuses on the research, which was conducted by the library and the main study, explaining the concept of wayfinding, wayfinding strategy, wayfinding of different people, different individual, gender, age and cultural group different components and wayfinding components, and finally check the wayfinding conceptual models.

Keywords: Wayfinding; Wayfinding strategy; Process of Wayfinding; Oriented search; Cognitive map; Locomotion; Navigation

1. INTRODUCTION

Wayfinding in complex environments is not only about the use of space knowledge and understanding of the environment, however it is related to numerous other factors. There is a long history of environmental issues and thus raise understanding of space science review in this issue is a good task. Perhaps, wayfinding with fundamental aspect of Lynch's book, in 1960 or the introduction of cognitive map theory Tolman from 1948 to 1973 was significant. This paper presents a wayfinding as a subject of research in environmental sciences and reviewed a number of researches in this topic in order to identify the wayfinding briefly. This paper, explaining the concept of wayfinding, wayfinding strategy, wayfinding of different people, different individual, gender, age and cultural group different components and wayfinding components, and finally check the wayfinding conceptual models.

About theory (Wayfinding)

Wayfinding means the ability to learn path through the environment and it has been introduced early 1960, followed by Kevin Lynch readability issues in the environment or loss, and cognitive map. Understanding human environment, mental process through the relationship between man and his surroundings is performed. Wayfinding "the use of space and environment to find direction in the built environment" is.

* Corresponding author. *Email address: Ali.emami.iau@gmail.com*

Table 1. Stage of development and the development of wayfinding.

wayfinding	Year	Theorists
Lynch signs arrow, number, street name and city guide signs as wayfinding equipment used. His five routes, nodes, edges, landmarks and areas associated with the perception of space and wayfinding is in the urban environment and the researchers explain some concepts like "spatial orientation" and "cognitive map" of the pioneers in this field is. His findings are generally called " wayfinding architecture approach" is described.	1960	Kevin Linch
They first examined wayfinding problem of how people from the perspective of cognitive science And to explain it on the basis of process-oriented approach. Their findings on issues such as how to collect environmental data and individual decision-making process focuses.	1973-1982	Downs & stea-Kaplan
He combines the "wayfinding architecture approach" and the findings of cognitive science for the first time explained wayfinding issue as a "to solve the problem of the place". He with Cooperation (1992 Arthur), Published one of the most important resources in the areas of routing Which examined the components of the architecture and wayfinding information and the interpretation of them would design language.	1984	Passini
Development and expansion of the past base Results	-----	-----

2. ANALYSIS THEORIES

Space is organized as hierarchical. In terms of psychology, people tend to have a straight line and right-angle turns. Wayfinding there between Search and mental representations. Navigation is not reviewed on the basis of physiological issues. Now we know that spatial processing consists of two separate mechanisms of the brain (hunt & waller, 1999).

Also, spatial and visual reasoning abilities is different specifically in people navigation. These differences include: individual differences, gender differences, age differences, cultural differences and differences in the health of people. Reports indicate that all people of the wayfinding ability and behavior are not the same; And they can be fit into four groups (Allen, 1999):

1. People who are focused on the cognitive and wayfinding depend on maps and written directions.
2. People who tend to verbal communication, and use in wayfinding of oral explanation about the track and directions.
3. People who are dependent on visual cues wayfinding Such as signs, colors and features of the environment.
4. Those who obtain the necessary information for wayfinding through interaction with others. This category does not mean that people can only find their way through one of the above ways; For example, it does not seem that a person who is dependent in wayfinding on a map, can not find its way through interaction with others, but most people classified on the basis of their ability to wayfinding (Arthur & Passini, 1992; Carpman & Grant, 2001).

The development of theories about wayfinding people

People are different in spatial and visual reasoning abilities, in particular, orientation. These differences include: individual differences, gender differences, age differences and differences in people.

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Table 2. The difference in wayfinding people

Theory	Year	Theorists	The difference in wayfinding people	
He concluded wayfinding ability is Related to IQ And people are weak with an IQ lower than 70% in the routing and spatial reasoning and intuitive.	1993	Carrol	Individual differences	
People with low verbal skills are weak in wayfinding and spatial skills, but the opposite is not true.	1989-1996	Daniel, Detterman- Deary & et al		
Children 12 years and older have the ability to learn the route and children under 10 years are easily lost.	1994	Cornell & et al	Age differences	
Elderly wayfinding capabilities are weak because of injuries and diseases that may be associated with increasing age.	1991	Salthouse		
Men are superior in the interpretation of data.	1997	Arthur,Hancock, Chrysler	Sex differences	
The strategy chosen by women and men are different.	1981	Anooshian, Young		
Women pay attention to signs and control points in wayfinding. Women strategy to landmarking (follow the signs to navigate through) due to greater accuracy is more appropriate. Men's strategy for navigation is appropriate. However, individual differences in perception of the scenes is more effective.	1994a 1996b 2009	Lawton-Hsiung Chen& Chih Chang& Te Chang		
Cultural differences are also effective wayfinding. He tested children in Europe and Australia showed that children bring to mind the name of a place in the European and Australian children to remember a clear picture of where they are.	1981	Kearins	Cultural Differences	
1. People with visual impairments are weak in the routing. His architectural solutions to help individuals named as follows: 2. diagonal elements, angled and curved avoided. 3. Large open space divided into smaller parts. 4. Use of signs. 5. Use flooring, lighting, texture, etc. 6. Increased tactile and visual elements	2011	Rousek, Hallbeck	People with visual impairments	Differences in health
Syndrome patient's weak wayfinding.	1993 1994	Mony; Murphy & et al	People with cognitive disorders (syndrome)	

Wayfinding

Review of existing research, with the aim of explaining the process that led to the wayfinding shows that this process has certain stages, yet interconnected, which include:

1. The decisions and development plans for action.
2. The decision to implement the program and decided to make a proper place and proper behavior.
3. Processing of data, which generally involves identifying and understanding the environment And basic information related to decision-making and implementation of the two forms.

Analysis of the three-stage process, valuable and fundamental information, the architects and the designers (Arthur & Passini, 1992).



Figure 1. Conceptual process model for wayfinding.

The wayfinding is path between the source and destination (Golledge,1999). Wayfinding can be divided into three categories exploration wayfinding, informed search and uninformed search categorized (Allen,1999). Allen also means for routing the six suggests, including 1- Oriented Search 2- Trail following 3- Piloting 4- path integration 5- Habitual movement 6- Cognitive map; that this is a conceptual diagram presented in the figure below:

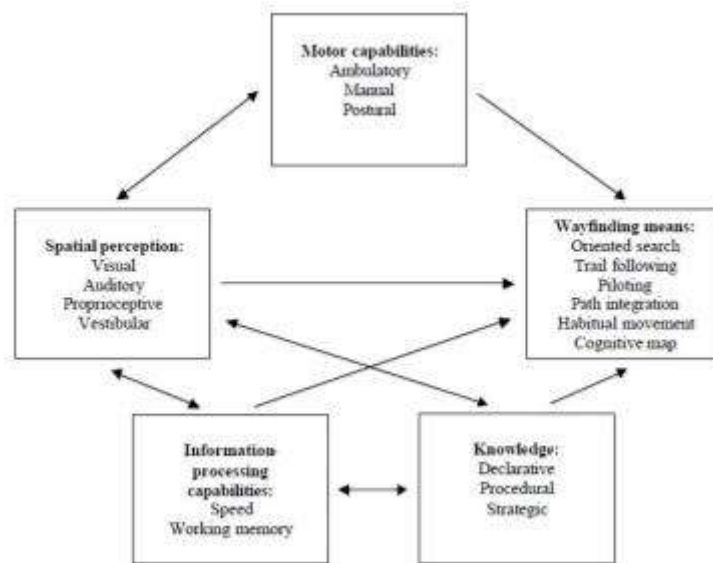


Figure 2. Speculative model of relations among interactive resources means from (Allen,1999, p. 79).

Other categories Montello Navigation divided into two categories wayfinding and Locomotion (Montello,2001-2005).

In addition, the wayfinding process, the following factors is essential (Huelat, 2007):

1. The person must know where it is.
2. Identify your destination and situation.
3. The path that led him to the destination.
4. In the next step, the correct path based on the environment data.
5. At the end of the process must then reaches its destination, it will identify.

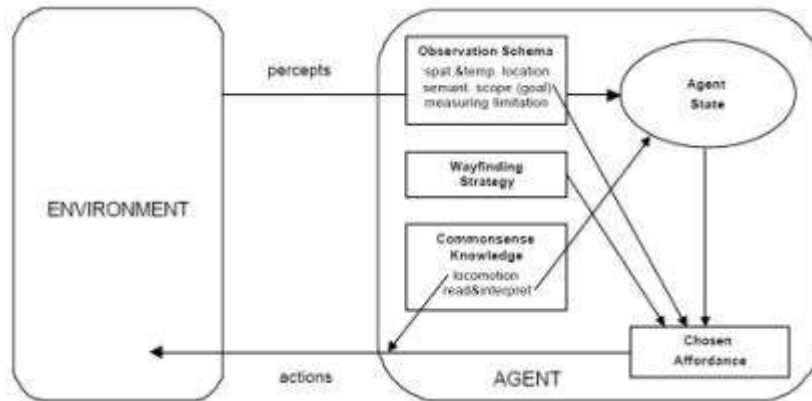


Figure 3. Interaction of components of the cognizing wayfinding agent.

In a more detailed definition, where an individual orientation, introduction to wayfinding. Orientation or identify a location is a fixed relationship with the place or the environment. It requires that the user has a mental picture of the schematic build environment, called a cognitive map; and in wayfinding; Mapping the cognitive processes, used to solve problems of positioning (Huelat, 2007).

In another; wayfinding is defined; "the use of space and environment to find direction in the built environment"(Brandon,2008).

Finally, we can say that wayfinding knowledge that, ability to put the "the correct information" in the "correct places" and "legible space" in order to facilitate the circulation and reach people in a complex environment provides.

Wayfinding strategies

After reviewing the wayfinding, they examined the spatial knowledge to choose the wayfinding strategies (Hoscher,Meilinger, Vrachliotis, Brosamle,Knauff.2006).

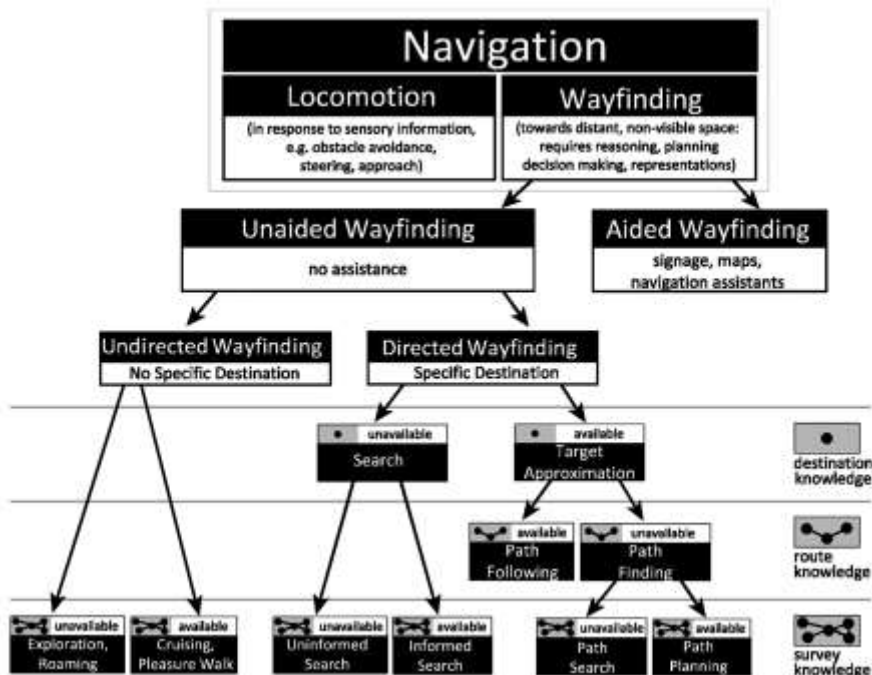


Figure 4. Proposed taxonomy of wayfinding tasks, classified by the existence of an external aid, a specific destination and the availability of different levels of knowledge.

The shortest path wayfinding strategy in this space knowledge is a key factor in the strategy of wayfinding. The strategy has been classified in three levels of space knowledge (wiener, Buchner,holscher, 2009):

1. knowledge about the destination
2. knowledge of the route to the destination
3. Knowledge of the environment

Table 3. Wayfinding strategies.

Theorists	wayfinding strategies
Linch,1960; Meilinger,2008	Strategy based on the graph (sequence of movements)
Hoscher,Wiener, tenbrink,2011	Strategy based on verbal communication (communication skills)
Maguire,Spiers,2008	landmarking
Tolman, 1948; Golledge,2004	Cognitive map
Dalton,2003; Maguire,Spiers,2008; Winter,raubal,2002 Hintzman& et, 1981	Strategy based on the direction (the direction of the main priorities in this way: North - South - East - West)
Kaplan,1995; hund, pedgitt, 2010	Strategy based on the angle (orthogonal streets read more to the angled street)

Wayfinding elements

Elements of the architecture: which includes color, texture, signs, And many of the specifications and elements architecture of the space, which leads the necessary information for wayfinding to the user.

Graphical Elements: Including maps prints, paintings guides, signs, kiosks and digital display devices and more.

Oral Elements: Including information officers or those who will be guide patients.

Tactile Elements: These elements reinforce the other elements or to facilitate wayfinding those with disabilities, including blindness or low vision to be handled; Including prominent boards, writing Braille and special flooring (Muhl,hausen,2006).

4. CONCLUSION

All people wayfinding abilities and behavior are not the same And some people rely on maps and written directions in wayfinding, Some people tend to verbal communication and Oral explanation on the direction and ways to use them more, Also, some people are depend on visual cues, such as signs and colors and features of the environment in wayfinding And others also find information for wayfinding through interaction with others. There are also differences in the wayfinding include individual differences, gender differences, age differences and cultural differences. Wayfinding elements are including elements related to architecture, graphic elements, oral elements and tactile elements.

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