Cognitive perspective ameliorates way finding in a complex shopping building having some architectural flaws

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This study aims at empirically analysing pedestrian movements to investigate architectural flaws with the assistance of some robust cognitive principles associated with an individual's brain in order to facilitate wayfinding of a stranger/tourist in a complex shopping building. A complex building having one main entrance and six secondary entrances were taken as the centre of observation. A total of 42 subjects were closely observed without their knowledge. This was essentially a blind randomised study, and the data collectors were themselves unaware of the objectives of the task. Data was collected during weekdays when maximum crowd was expected. The experimenter selected the subjects who only roamed around the building with no immediate goal of purchasing anything. One subject was followed for a maximum of ten minutes, and if he/she got out before that then the time was noted. Entry gate was taken as the independent variable, while exit gate, total time taken, total distance covered and number of pauses were taken as dependent variables. Pearson correlation was calculated between variables. Result showed that there was least entry from gate number 6 which was due to poor building design. People found it difficult to identify the location, because of smaller dimensions of the gate and since the larger portion was covered with the wall. Another finding was that people covered large distance to take an exit from gate 6, and reason was that their head bearing led to longest corridor as entry opened in that corridor. Application of cognitive principles can facilitate wayfinding such as provision of a survey view of shopping complex at each entry point can improve orientation of person.

Keywords: Cognitive principles, Wayfinding, Architectural flaw.

I. ABSTRACT

I.I. Background

Wayfinding in a complex building requires a lot of cognitive abilities like learning , memory, decision making etc. Other way to identify routes and make trail from entry gate to exit gate is to either follow a map or rely on the given instructions. People in an unfamiliar environment often requires assistance. Moreover, cognitive science offers help to ease wayfinding in an unfamiliar building (Peters, 2012). This can be provided by visuo-spatial system (Münzer, & Stahl, 2007) that assist the navigator's ability to locate himself; identify route to destination; and accumulate spatial information for the space. Considering all this points, cognitive principle guide navigator for successful wayfinding. In this study, we aim to apply cognitive principle to provide a solution for a architectural point of view(complex shopping building). Once building is constructed, spaces around the building and surroundings can either assist or disorient the navigator which contribute to architectural flaw.

I.I. Methodology / Procedure

Participants: This was essentially a blind randomised study, and the data collectors were themselves unaware of the objectives of the task. Forty two subjects were closely observed without their knowledge.

Apparatus: A complex building having one main entrance and six secondary entrances were taken as the centre of observation. Exit can be made with those entrances, also. Data was collected during weekdays when maximum crowd was expected. Experimenter had pedometer and GPS enabled system which could measure variables like steps taken, distance covered etc. Experiment did not count the subjects who took entry and exit from the same gate.

Procedure: The experimenter selected the subjects who only roamed around the building with no immediate goal of purchasing anything. One subject was followed for a maximum of ten minutes, and if he/she got out before that then the time was noted.

Analysis: Pearson correlation was applied on the obtained variables in the 'R' software. Entry gate was taken as the independent variable, while exit gate, total time taken, total distance covered, and number of pauses were taken as dependent variables.

I.3. Outcome / Discussion

Correlation analysis revealed strong relationship for 'average distance covered' and 'average time taken', r=.358,p=.004, and 'average time taken' and 'total number of pauses', r=.351, p=.005 as shown in Fig.1. Similarly scatter plots were drawn to identify patterns between this variables (Fig.2 and Fig.3).

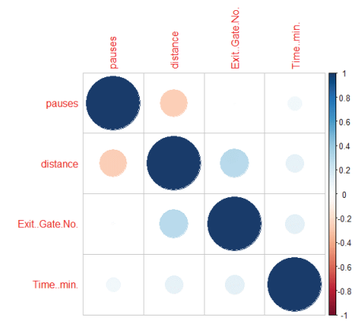

Fig.1 Correlation result between different variables

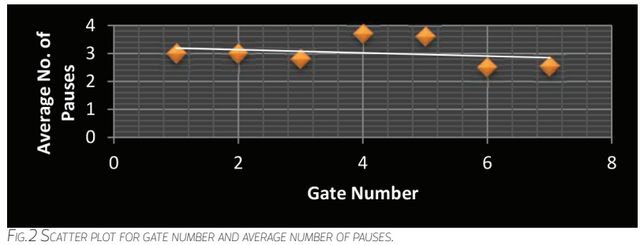

Fig.2 Scatter plot for gate number and average number of pauses.

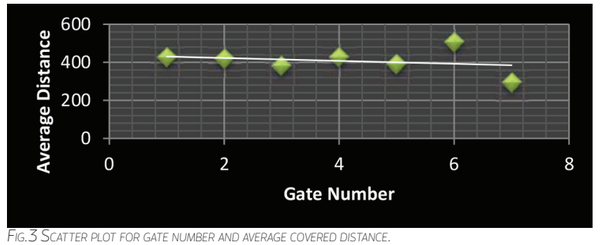

Fig.3 Scatter plot for gate number and average covered distance.

Result showed that there was least entry from gate number 6 which was due to poor building design. People found it difficult to identify the location, because of smaller dimensions of the gate and since the larger portion was covered with the wall. Application of cognitive principles implicated that it would be better to install signboards to indicate the entry gate (Passini, 1984). Another finding was that people covered large distance to take an exit from gate 6, and reason was that their head bearing led to longest corridor as entry opened in that corridor. Reflection can be applied for people to calculate the distance from exit or another kind of exploration which would reduce the probability of getting lost. In addition to this, provision of a survey view of shopping complex at each entry point can facilitate wayfinding (Bovy & Stern, 2012;Thorndyke & Hayes-Roth,1982). Future scope of this study can be identified in the form of application such as understanding the applied cognitive principles can improve performance besides just constructing a mental map. Also, in the low intensity conflict scenarios, where at the time of any kind of disaster inside the building, applying cognitive principles would make the mission a successful operation with minimum casualties under virtual reality training.

2. REFERENCES

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