

## 1. INTRODUCTION

### Notification systems

- Notification systems have been used in computer software applications to inform users on current happenings (refer Figure 1)
- Cues are employed exploiting visual, audio or the combination of both modalities to notify users
- Notification systems that let users keep track of various information in one platform such as Dockstar and Growl, support users' busy schedules and the need to keep track of changes constantly
- Managing the many information sources is complicated, and might interrupt primary task when not managed accordingly
- Therefore, understanding the relationship between different visual parameters of the interfaces and how they could manipulate human's categorization capability is the key to successful systems



Figure 1. Notification system

### Human factors

- Human factors is the area of studies that relates to the knowledge of human abilities, characteristics, limitations and behavior with the design of man-made objects, facilities and environment that people use
- Objectives of human factors are to 1) enhance the effectiveness and efficiency of human activities and to 2) maintain or improve desirable human values eg., health, safety, satisfaction
- Findings from past significant researches studying these functions have been widely applied to various disciplines including user interface applications. Those findings include;
  - Miller's[3] "magical number seven, plus or minus two", which argues that the number of objects an average human can hold in working memory is  $7 \pm 2$
  - Fitts's law[1], which is a model of human movement predicting that the time required to rapidly move to a target area is a function of the distance to the target and the size of the target. It could be described by the formula;  $ID = \log_2(D/W + 1)$
- The execution of operational functions involves a combination of basic functions [2] displayed in Figure 2

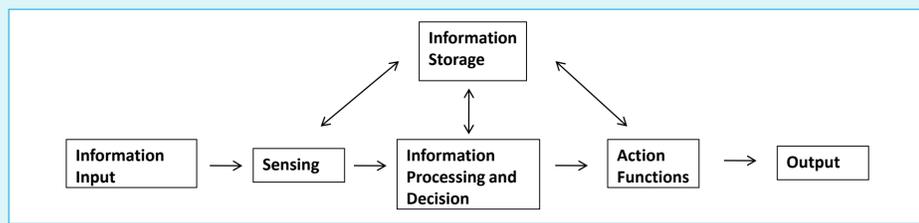


Figure 2. Human basic functions

## 2. AIM

- Investigate the relationship between visual cues and users' ability to recognize categories in a notification system
- Understand the reasons of findings based on human factors
- Provide a guideline for system developers to built related applications

## 3. HYPOTHESIS

H1-1) Spatial cues allow user to more easily identify categories and differentiate cues

H1-2) The use of color and shape in visual cue yields better identification/differentiation performance than the use of size and motion

H2-1) The use of distinct hues in visual cue yields better identification/differentiation performance than the use of similar hues

H2-2) The use of familiar shapes in visual cue yields better identification/differentiation performance than the use of random shapes

H2-3) Similar identification/differentiation performance between both location types

H2-4) Superior identification/differentiation performance in locations, distinct hues and familiar shapes parameters

## 4. RESULTS

VISUAL PARAMETER	ACCURACY & RESPONSE TIME		
SIZE		31%	3739 ms
MOTION (4 types x 2 frequency)		59%	9792 ms
COLOR			
1) DISTINCT HUES		82%	4156 ms
2) SIMILAR HUES		32%	5036 ms
SHAPE			
1) FAMILIAR		85%	4095 ms
2) RANDOM		64%	4744 ms
LOCATION			
1) 4X2 GRID ARRANGEMENT		79%	4679 ms
2) 2X4 GRID ARRANGEMENT		85%	4788 ms

Figure 3. Experiment result

## 5. DISCUSSION

- Superior performance by spatial cues supported by spatial memory to learn and memorize, as well as ability to compare the cues by their geographical information
- Size parameter performed poor because users did not have anything to compare those sizes to, thus hard to make judgment
- Identification of motion takes longer than static cues, therefore leading to longer response time
- Color/shape cue could offer greater affordance through linguistic association of cues

## 6. CONCLUSION

We investigated the relationship between visual cues and users' ability to recognize categories in a notification system. Results suggest that spatial cue and color/shape cue, which offer greater affordance through linguistic association, provide better notification of categorical information.

### REFERENCE

- [1] Fitts, P. M. The information capacity of the human motor system in controlling the amplitude of movement. *Journal of Experimental Psychology*, 47(6), pp. 381-391 (1954)
- [2] McCormick, E.J., Sanders, M. S. *Human Factors in Engineering and Design* McGraw-Hill (1982)
- [3] Miller, G.A. The Magical Number Seven Plus or Minus Two: Some Limits on Our Capacity For Processing Information. *Psychological Review* (63), pp. 81-97 (1956)