

FIT5190 Assignment 1: Research Writing Task 3

Place your research in context

Please write two paragraphs or more to (a) outline current research in the field, (b) state where your research stands, and (c) indicate how your research may contribute to the field.

Example 1: Effective use of graphics in web page design

The first impression and subjective experience of web users are strongly influenced by the appearance of the web page. In contrast to the abundant amount of studies focusing on human-computer interaction or usability of web pages, only a few studies have focused on the visual aesthetics of web pages (Tuch et al., 2010). As a result, researchers and users can hardly find any reference to aesthetic considerations in web page design (Lavie et al., 2011), even though aesthetics is found to play an important role in new web page design. To fill this gap, this research addresses the web aesthetics issue in relation to visual ergonomics with focus on the use of graphics, rather than operational ergonomics in relation to usability.

Graphics play an essential role in enhancing the visual layout of web pages (Noiwan and Norcio, 2006). The primary purpose of using graphics on a web page is to get users' attention and give visual focus on the function of the web page. In addition to enhancing the function of a web page, effective use of graphics will enhance its appearance and make it visually appealing. However, overuse or misuse of graphics on a web page will confuse users (disorientation and cognitive overload), undermine its functionality, and increase the download time of the web page. In order to meet users' feelings and expectations about a particular web page, a balanced combination of graphics and text is required (Koh and Sundar, 2010). However, few studies have examined how various ratios of graphics to text affect the users' feelings about a web page, and whether or not there is an adequate combination of graphics and text to match the users' preferences for a web page. In addition to the combination of graphics and text, there are other distinctive design elements of a web page that may also affect the users' feelings (or aesthetics) about the web page (Cheng and Patterson, 2007). To address this issue, this research conducts an experimental study on university web pages using a number of modelling and analytical techniques including morphological analysis, Kansei Engineering, grey relational analysis, and neural networks.

The result of this research has demonstrated the advantages of using these techniques to examine how the ratio of graphics to text and other key design elements of a web page will affect the users' feelings about the web page. In particular, a web page design support database based on the neural network model has been developed to help web designers find out the best ratio of graphics to text for a given set of design elements and the users' feelings in web page design. In specific design settings, the design support database can be used to help web designers work out the optimal combination of design elements of web pages for enhancing users' particular expectations and meeting the desirable aesthetic consistency.

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Example 2: Selecting multiattribute decision making methods

Multiattribute decision making (MADM) has been widely used to rank or evaluate a set of alternatives with respect to multiple, usually conflicting criteria or attributes (Dyer et al., 1992; Yeh et al., 2000). As suggested by existing studies (Zanakis et al., 1998; Hobbs and Meier, 2000), different MADM methods often produce inconsistent ranking outcomes for the same problem. It is thus desirable to apply more than one MADM method to solve a given ranking problem, followed by a validity check for selecting the most valid ranking outcome (Hobbs et al., 1992). Despite the significant development in MADM research, the validity of the ranking outcome remains an unresolved issue. This is mainly due to the fact that there are no objective measures of a decision maker's values (e.g. scales, ratings, weights) to which the results of an MADM method can be compared (Hobbs and Meier, 2000). In addition, there is no such thing as the "right answer" as the concept of an optimum does not exist in a multicriteria framework (Belton and Stewart, 2002). This implies that the "true" cardinal ranking of alternatives is not known or cannot be obtained in a universally accepted way.

To address this problem, this study develops a new empirical validity procedure for selecting the most valid ranking outcome from those produced by different MADM methods. The selected ranking outcome will have the minimum expected value loss from the unknown true one, which is assumed to be associated with the true attribute weight vector, which is not known but its possible bounds can be set. The validity procedure can be easily adjusted and applied to any given attribute weight vector and any set of bounds on the weights. For example, the attribute weight vector can be obtained by a reliable weighting method commonly accepted by the stakeholders for determining the ranking outcome. The weight bounds can be set based on the overall perception of the stakeholders about the degree of relative importance of the attributes as a whole. In decision situations where attribute weights

assessed by individual stakeholders are available, the weight bounds can be based on the range of stakeholder weights.

This study makes significant methodological contribution to MADM research. With its simplicity in both concept and computation, the empirical validity procedure can be applied to the general multiattribute selection problem solvable by different MADM methods, particularly in situations where attribute weighting is a great concern and no reliable subjective weights can be obtained. It is particularly suited to large-scale selection problems where the ranking outcome produced by different methods differs significantly.

References

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Example 3: Sustainable planning of e-waste recycling activities

Recycling research has primarily focused on technological issues and logistics activities associated with recycling. While these issues are important, the viability and competitiveness of the recycling industry also depend largely on operational decisions being made to underpin sustainability. The corporate sustainability of a company is achieved by delivering environmental, economic, and social benefits simultaneously (Elkington, 1997). As such, e-recycling companies should consider the economic, environmental, and social dimensions of their corporate sustainability simultaneously when planning the e-waste recycling activities. Although many concepts, frameworks and tools are available to address the sustainability issue, the question of how to integrate sustainability into the operational decisions of a company persists (Hannon and Callaghan, 2011).

To fill this important gap in sustainability research, the study develops a novel sustainable planning approach for the operational decisions of e-waste recycling. This development also addresses the question of how to best weight individual index metrics, which is an important gap in the environmental index construction research (Bellenger and Herlihy, 2010). Instead of applying commonly used subjective weights or equal weights for the sustainability dimensions, this study develops a series of optimisation based models to objectively determine optimal weights that maximise the overall sustainability performance of e-waste recycling activities.

This study represents an original contribution to the methodological development of weighting the three dimensions of the corporate sustainability for planning decisions. In practice, the study addresses the need for incorporating sustainability into the strategic and

operational planning of a company (Hannon and Callaghan, 2011). In this regard, it contributes to the recycling planning practice of e-recycling companies by providing them with a proactive mechanism for incorporating the concept of corporate sustainability into their regular recycling planning decisions.

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Example 4: A performance-based approach to project assignment and performance evaluation

Project assignment and performance evaluation are two critical processes in project management. Project assignment has been done essentially by matching the abilities of project managers with the requirements of projects (Patanakul et al., 2007). Existing studies on project performance evaluation use different methods based on different sets of evaluation criteria and factors that affect the performance of projects (Marques et al., 2011). Despite the fact that project assignment and project performance evaluation have been well addressed by existing studies, they are treated as two separate research problems in project management. To address these two research problems in an integrated manner for managing multiple projects in a project-based organisation, this study develops a new performance-based approach.

The rationale behind the conceptual development of this performance-based approach is that project managers will prefer to undertake a project that they expect to perform best and contribute most to the organisational objectives. The organisation will prefer to assign a project to a project manager who is expected to perform best and contribute most to the organisational objectives. That is, the performance-based approach addresses two major issues raised by previous project assignment studies, such as Adams et al. (1979), Mian and Dai (1999), Hauschildt et al. (2000), and Patanakul et al. (2007). First, a project should be assigned to a project manager who is expected to have the best performance on the project. Second, the project assignment process should ideally help maximise the overall contribution of the projects to the organisational objectives.

The performance-based approach provides a formal methodology to integrate project assignment and performance evaluation for best achieving the organisational objectives. It

provides project-based organisations with a proactive and transparent mechanism for facilitating objective-focused management of projects. The outcomes of an empirical study conducted provide managerial insights in managing the assignment of new projects to project managers and in evaluating the performance efficiency of the completed projects and their responsible project managers.

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