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論文題目	A Customer-Oriented Approach for Decision Support on New Product Development for ODM Clients
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論文の内容の要旨

Due to a rising of online marketing, there are abundant of Original Design Manufacturer (ODM) clients existing in the market. To capture the market share, it is necessary for them to launch a customer-oriented product, which leads to the customer satisfaction and a success of the product at the end. In doing so, ODM clients need decision supports on their tasks to keep customers' focuses in all stages of the new product development (NPD) processes. However, ODM clients' tasks receive little attention in the literature and there is no decision support for ODM clients in NPD.

Motivated from these limitations, a customer-oriented linguistic approach for decision support on NPD for ODM clients is proposed in this study. The study focuses on three ODM clients' tasks for developing a new beverage product. Those tasks are 1) identifying customer-oriented product concept, 2) providing product specification to ODM manufacturers, and 3) screening an evaluation on go/no-go product. To support these three ODM clients' tasks, three models are developed.

For the first ODM clients' task, a model for prioritizing customer-oriented product concepts is developed so that a set of suitable product concepts is identified. In this model, a linguistic computation approach based on membership functions is applied to prioritize customer-oriented product concepts.

For the second ODM clients' task, a model for translating customer requirements to manufacturing requirements is introduced so that ODM clients are able to provide a product specification to their ODM manufacturers for supporting the manufacturing process. In this model, a linguistic computation based on term index is used to analyze customers' preferences on product characteristics.

For the third ODM clients' task, a model for evaluating customer-oriented product performance is developed so that ODM clients are able to screen go/no-go product. Here, the product performance is determined from the difference between the interval target linguistic terms and the interval perceived linguistic terms. In this model, a linguistic computation based on term index is used to analyze the interval perceived linguistic terms from customers.

The critical challenge in developing these three models is the loss of information from the approximation process in retranslating computed linguistic information to its initiated domain. Generally, the results of computing linguistic information do not match with their initial linguistic terms. Thus, the approximation process is needed to retranslate the computational linguistic results into their initial domain. However, the approximation process usually leads to the loss of information. This loss of information implies a lack of precision in the final results. Hence, it is important to develop models for supporting ODM clients' tasks that can avoid the loss of information during the evaluation processes. In this study, such an issue is the main concern in developing three models.

To demonstrate the effectiveness and applicability of the proposed models, a case study of developing a new soy milk beverage product is used. Consequently, all models show their abilities over the existing models. In summary, the effort in this study is to analyze linguistic information existed in ODM clients' tasks in order to provide a recommendation on NPD for ODM clients.

Keywords: Multiple criteria group decision making; Interval linguistic assessment; Probability distribution; Manhattan distance measure; New product development; ODM clients

論文審査の結果の要旨

With the rise of online marketing, many companies recently used the so-called Original Design Manufacturers (ODM) for designing and manufacturing of their products. To capture the market share and keep a competitive edge, such companies called ODM clients need to develop new customer-oriented products more regularly and efficiently. In doing so, ODM clients need decision supports on their tasks to keep customers' focuses in all three main stages of the new product development (NPD) process, particularly including identification of product concepts; translating product specification into product design; and screening new product for go/no-go decision making.

The research of this Dissertation is aimed to develop a customer-oriented approach for decision support in NPD for ODM clients. The research problem is well formulated, and an adequate overview of relevant theoretical and practical background literature is provided in the dissertation. As for the contributions of this research, three decision support models have been developed for solving the aforementioned three

ODM clients' tasks in their NPD, particularly, a model for prioritizing customer-oriented product concepts, a model for translation of customer requirements into manufacturing requirements, and a model for evaluation of customer-oriented product performance. A significant challenge in developing these three models is how to handle subjectivity, qualitative and ambiguity in customers' perception of product, interestingly the research of this Dissertation has provided new ways of modeling and aggregating customers' opinions and preferences so as to overcome disadvantages of the existing linguistic decision models developed previously in NPD. For demonstration of the effectiveness and applicability of the proposed models, the case study of developing a new soy milk beverage product by Wangsukjai Export Ltd., a Thai beverage company, was used, in which all developed models were analyzed in comparison to the previously existing models. Some limitations and further work have been also highlighted and identified in conclusion of the Dissertation.

The research work presented in this dissertation has resulted in three journal papers, two of which have been published and accepted for publication, and four refereed conference papers.

In summary, Ms. SUPRASONGSIN Sirin has completed all the requirements in the doctoral program of the School of Knowledge Science, JAIST and finished the examination on July 25, 2018, all committee members approved awarding her a doctoral degree in Knowledge Science.