■ 논문요약문3

논문제목	Knowledge Extraction and Visualization of Digital Design Process
게재정보	Expert Systems with Applications, 92(2018)
개요	After digitally designing components of vehicles, a design team creates a virtual manufacturing environ- ment that resembles actual manufacturing facilities. During this digital pre-assembly process, a review team examines each component, and records its problems and requirements in part verification reports. Once these reports are delivered to specific design team responsible for each part, the design team can make appropriate adjustments to their designs. This digital pre-assembly process can evaluate and pre- vent flaws in design prior to actual manufacturing, improving production quality and reducing manu- facturing cost. As these reports are written in free text form, they, however, are not fully utilized for understanding problems arising from the design process. This paper proposes a method of applying text mining techniques on verification reports to extract insights for quality improvement.
연구결과	The proposed method is applied on approxi- mately 140,0 0 0 reports, and is validated through the quality of the answers obtained for the questions posed by the domain experts. The proposed method successfully extracts useful information from the text database, and provides intuitive graphical interface, thereby satisfying the need of the domain experts. This paper proposes a systematic framework of transforming huge amount of raw text data into intuitive visualization. Through this framework, meaningful knowledge can be extracted, analyzed and shared to improve the quality of the products. Main contribution of our paper is that it proposes a framework for knowledge extraction from pre-assembly process. Not only does it systematically arrange the data, but it also combines various data sources and creates a knowledge system to improve efficiency of the design process.
활용분야 및 기대효과	In this paper, fol- lowing three text mining approaches are proposed: (1) Extracting n-grams for text preprocessing and constructing domain ontology; (2) Extracting meaningful insights from text preprocessing; (3) Creating intuitive visual tools to understand the extracted insights.