DEVELOPMENT OF DESIGN TRIZ FORCONVERGED DESIGN SERVICE SYSTEM USING PATENTED BIG DATA ANALYSIS METHODOLOGY

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Abstract: The objective of this research is developing design TRIZ idea for convergence design solution using patented big data analysis methodology.Development of design TRIZ idea for convergence design will be three steps for design solution service. First, analyze the patented trend service. Second, design TRIZ idea, and the third design IP(Intellectual Property) value evaluation service. Designing TRIZ idea is focused on this research. For designing TRIZ idea, first, constructing 42 factor tables that added 3 contradictory design factors to 39 existing contradictory factor. Assign and apply 59 newly developed design resolution principles to the existing 41 technology resolution principles table. After collecting 56 data base cases based on design solution principle, applying to converged design service system. Based on contradiction factors applying to design TRIZ, design intellectual property evaluation index with Gestalt theory will be developed. Design intellectual property evaluation manual will be established through research linked with technical value evaluation index. System development and system performance will evaluated by the user. User evaluation will be done two times by experts and user of the patent searching service. Experts and users will give a feedback about service error and various issues of the patent searching service. Based on business model scenario, three main core integration services will be constructed and service platform will be established. With those result of research, converged design service system using patented big data analysis methodology will be made.

Keywords: Design TRIZ, Contradiction Factor, Patent, Inventive Principles

I. INTRODUCTION

Development of technology convergence design service solution using patented Big Data analysis methodology will be deployed 6 steps.

1. Construction of hardware system. Data analysis and database system service will provided. There will be three steps in hardware system construction. First, patent database construction. Second, database construction. Third, hadoop cluster construction.

2. Patent trend analysis service system development. Patent big data database system construction and advanced study will be done by system. There will be five systems. First, thesaurus mapping system. Second, patent search type automatic completion system. Third, heterogeneous / homologous patent classification system. Fourth, analysis result providing system. Fifth, keyword converting system.

3. Design TRIZ service system development. Resolution principle case database will be constructed by system and advanced research will be done. There will be 4 steps in design TRIZ service system development. First, contradiction check system. Second, contradiction factor table autocomplete system. Third, design resolution principle case providing system. Fourth, solution matrix system.

4. Design intellectual property service system development. Advanced research by system will be executed. There will be 4 steps in design intellectual property service system development. First, product summary registration system. Second, online pay service system. Third, design intellectual property value evaluation registration and management system. Fourth, evaluation report management system.

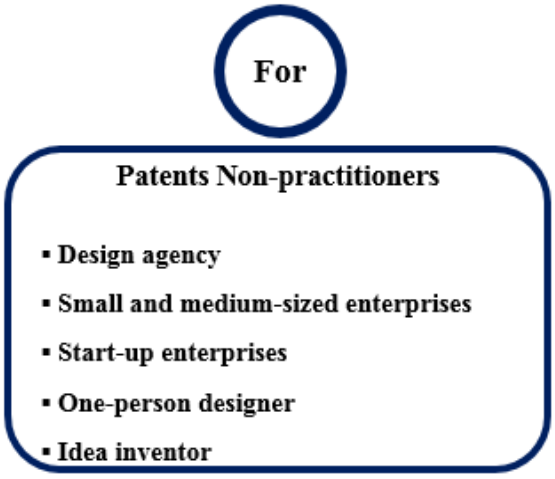
5. Usability evaluation simulation based system verification. Usability evaluation and verification will be done on three different services. There will be four steps in usability evaluation simulation based system verification. First, making a model for a user evaluation design system. Second, making a system for verification by expert. Third, usability evaluation will be done for two times by the expert and user. Fourth, usability verification and error correction will be executed. Fifth, final evaluation for system will be established.

6. Integration system construction. There will be an integration management system construction.

Design TRIZ service system development is focused on this paper.

II. OVERALL CONCEPT FOR DESIGN SERVICE SOLUTION DEVELOPMENT

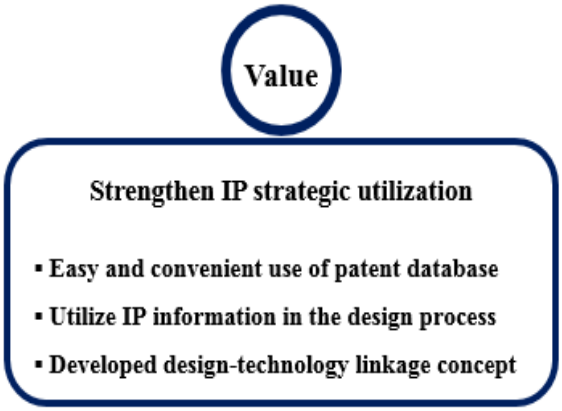
Technology convergence design service solution using patented Big Data analysis methodology is for non-specialists about patents.



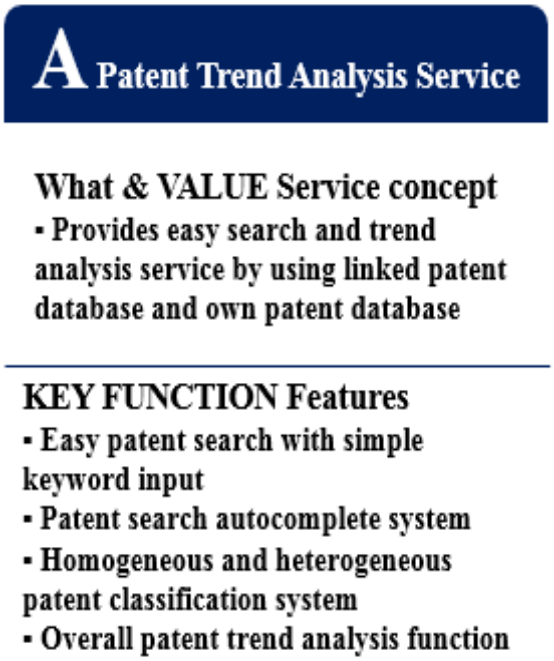
Technology convergence design service solution using patented Big Data analysis methodology provided 3 services, patent trend analysis service, design TRIZ idea invent service, and design intellectual property evaluation service.



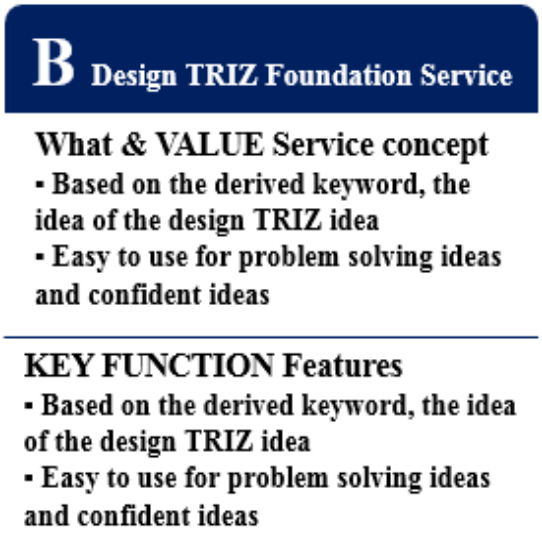
Technology convergence design service solution using patented Big Data analysis methodology will achieve remarkable results.
It will provide an easy and convenient patent database application for user.
Intellectual property information could be used in the process of design TRIZ.
Design and technology convergence concept will be developed.



What & Value analysis service is for patent trend analysis service, it will provides an easy search for a non-expert in patent area
Trend analysis service is constructed for all users by using linked patent database and own patent database.
Key function has easy patent search function with just a few simple keyword input.
Patent search could be done by autocomplete system.
Patent classification system is possible not only homogeneous but also heterogeneous words.
Finally, overall patent trend analysis results will be shown.



Design TRIZ foundation service is based on derived keyword. The idea of the design TRIZ idea will make it easy problem solving ideas and confident ideas.
Key functions are design idea for problem solving, providing a easy chart for a non-expert, support priority for solution principle and solution matrix chart will be given with idea invention.



Design intellectual property evaluation service will develop patent value and design value factor convergence.
It will provide anobjective expert evaluation service for developed products.
Key function for a design intellectual property is providing product development summary completion chart, present a value evaluation report with the view of patent and design convergence, objective expert evaluation for a developed products and expert advisory feedback service.

C Design IP valuation service

What & VALUE Service concept
- Patent value + design value factor Development of convergence evaluation tool
- Objective Expert Evaluation Service for Developed Products

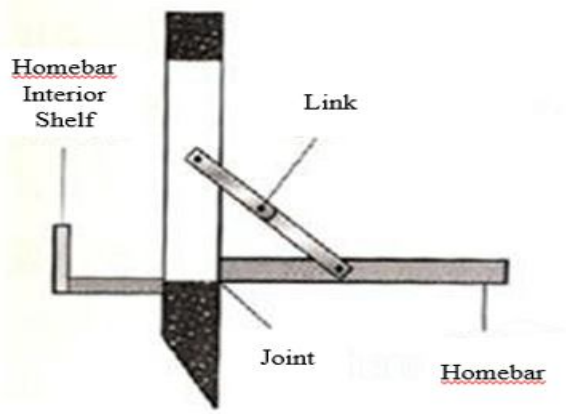
KEY FUNCTION Features
- Provide product development summary chart
- Patent and design convergence view Valuation report presentation
- Objective Expert Evaluation of Developed Products
- Expert advisory feedback

III. EXAMPLE OF TRIZ

A case study on 56 design solving principles derived from business model research database.

Table 1. Design solution principle case

Problem	Existing yoke of two door refrigerator's homebars are expensive and there is a risk of damage because it is located outside, especially the competitor's patent infringement possession is possible
Solution	Instead of getting rid of the connection device, extend the homebar door into the refrigerator and open the door so that the lengthened area touches the shelf inside the refrigerator
Principle	TRIZ principle of superposition and precautions.



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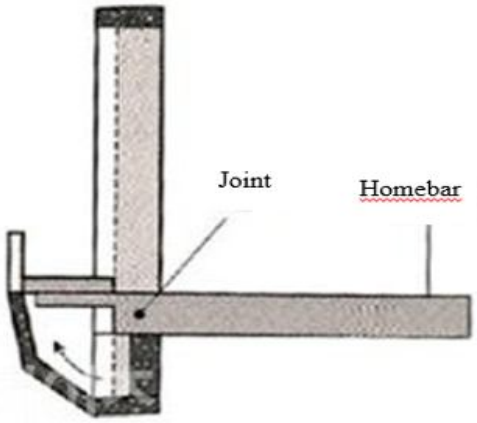

IV. APPLYING DESIGN RESOLUTION PRINCIPLE TO CONTRADICTION FACTOR TABLE

There are 1,722 contradictions of design TRIZ and 1,482 contradiction principles proposed by TRIZ.Of the 1,722 contradictions, 240 remain, except for the 1,482 contradiction principle proposed by TRIZ240 cases of solution principles are placed in each cell, and 4 contradictory tables are completed by presenting the top resolution principles on the basis of frequency.

CONCLUSIONS

Three main core service models were derived previous research. For each services, deep research will be executed and develop a system. Based on user evaluation of system performance, constructing total integrated system is final goal of this research.
Three main service models are patent trend analysis service, design TRIZ service, and design intellectual property value evaluation service.
In patent trend analysis service, it will make is easy to search for patent for non-expert about patent. Thesaurus mapping system, patent autocomplete system, homogeneous/heterogeneous classification system, analysis result providing system, and keyword converting system will be developed.
For a design TRIZ service, three design contradiction factors are added to existing 39 technology contradiction factors. As a result, there will be a 42 contradiction factor table. In the end, new design solution principle of 59 factors will be established based on existing 41 technology resolution principles.
Design intellectual property evaluation service will derive design intellectual property evaluation index based on contradiction factor in design TRIZ and Gestalt theory. Design intellectual property evaluation manual will come out by combining technology evaluation factor and design value evaluation model research.

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