A New Crowdsourcing Platform for Product Designs

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Background

Small and Medium Enterprises (SMEs) normally have very limited resources available for developing new products, such as lacking in-house design professionals and effective ways of communicating with their customers and other stakeholders on the supply chain at the design stage. As crowdsourcing has been regarded as an effective way for SMEs to get access to a large number of Internet users to help in product design and even manufacturing at relative low cost, thus it has a great potential to be used as a digital collaborative product design platform (or virtual workspace) to overcome the resources constraints on new product development.

The existing crowdsourcing platforms for design can only support part of design processes [1, 2] in product design and development, and there is few research on designing an enterprise-configurable crowdsourcing platform which can support a product development through its whole lifecycle by engaging not only ordinary crowd but also various professionals, business partners and other stakeholders along its supply-chain.

Research Aims

Our research aims to develop a new crowdsourcing-based digital platform to support a product/service through-life development with help from crowdsourced resources.

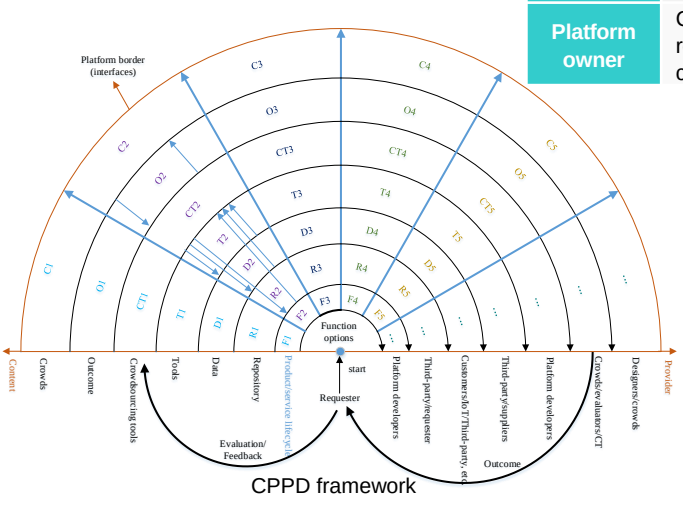
Platform Design

Platform framework

The platform as shown in Figure below from left to right along the circular direction can support product development stages Fi from marketing, concept design, to recycling.

To support each stage work, the platform has knowledge repository (R), data (D), application tools (T) and crowdsourcing tool (CT) to support interactions between the Crowd (C) and the platform, resulting in outcomes (O) along the radical direction. At the beginning, O is null.

C: a set of crowds plus designers, evaluators, suppliers, customers and potential customers, and other stakeholders.



CPPD framework

CT tools interact with the crowd (C) and connect them with access to the internal layers (R,D, and T).

As a result of a crowdsourcing request from a SME requester, the outcomes are generated based on the requester made and collaborative work among the crowd supported by CT and R, D and T. The chosen outcomes will be sent to the requester and the evaluation feedback organized by the requester can be sent back to CT for next round design in an iterative manner.

Platform Key player and interfaces

Key players on the platform are classified as requester, designer, evaluator, Third party/supplier, customer and platform owner/administrator. The key functions a specific role player can do are listed in the table below. They interact with the platform through built-in platform interfaces. From the **registration Interface**, a platform user can register on the platform and will be classified with a role. According the role, a **private panel** will be used for role-related communication and data management. A **Public panel** is mainly to display platform-related information, including the advantages of CPPD, news about CPPD, how it works, and the cases performed on the platform.

The user's play role	Key functions
Requester	Propose design requirements, answer the questions asked by platform users, view design solutions, etc.
Designer (Crowds)	View design requirements, submit design solution, ask and answer questions about the design requirement and design solution, team up to perform design tasks, view comments to design solution, etc.
Evaluator	Evaluate design solutions, view design solutions, ask and answer questions about evaluation criteria and evaluation results, etc.
Third-party/ Supplier	Submit qualification materials, submit services it can offer, answer questions about its services, etc.
customer	Provide their feedback/user experience/ideas/suggestions, etc.
Platform owner	Communicate with the requester, price the crowdsourcing service, etc.

Repository: static information including laws, regulations, standards, etc.
Data: dynamic information acquired from customers, sensors, IoT devices, etc.
Tools: public software and tools used for data analysis, visualization, etc.
Crowdsourcing tools: platform built-in tools, used for task decomposing, distribution, recommendation, etc.

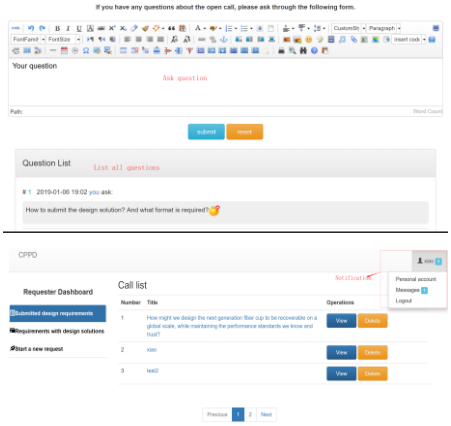
Teamwork panel is to provide a design space for a group of designers teamed up for a specific product design/service task. In this panel, the team members could have real-time communication and share design ideas with each other just as in a practical meeting room.

Platform Communication Mechanism

The communication among panels includes two parts: real-time and non-real-time. The communication between private and public panel is non-real-time while it is real-time in teamwork panel.

(5) Examples of key interfaces

Website: http://3.8.164.26:8000/



Discussion and conclusion

This platform provides a virtual design space for crowds and all stakeholders crossing product lifecycle, which makes it possible to perform product design tasks in an integral way by connecting it to the other product development, manufacturing and service stages without the constraints of time and area. Although CPPD already applies access mechanisms to make data security, it still needs corresponding regulations to protect intellectual property and design rights. When the above functions are realized, SMEs will get an innovative way to perform their product design and development tasks. Compared to traditional outsourcing or crowdsourcing platform, this new platform will provide crowdsourced resources not only from the traditional crowds but also various stakeholders and potentially integrated with IoT and sensors to improve SME's productivity.

Acknowledgments:

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References:

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