Design Choices and Adoption Processes: from Engineering Designed Products to Services

Doctoral Dissertation
Doctoral Program in Management, Production and Design (33rd Cycle)

Design Choices and Adoption Processes: from Engineering Designed Products to Services

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Politecnico di Torino
March 04, 2021

Summary

When designing new innovations, one mistake companies are led to make is to consider only the technical aspects related to the product or service being developed. In this respect, Design for Innovation means considering all the design issues relevant to adoption. This is equivalent to study the diffusion dynamics of new technologies in order to understand whether potential customers could adopt new products and services or not. The thesis aims to deepen the study of product and service diffusion and adoption and address the impact of design choices on the adoption process.

The literature has extensively investigated product diffusion, and first contributions date back to the 1960s. In addition to the mathematical models to trace the diffusion curves, contributions around the first steps of diffusion arose, such as the concepts of first-mover advantages and time-based competition. The idea here proposed is that rethinking time, defined as the time available to firms to redesign products according to the needs of upcoming customer segments, may be one of the moderating effects of first-mover advantages.

On the other side, service diffusion is a very underdeveloped topic. Despite studies about product diffusion date back many years, they neglected the existence of services mainly because, at the dawn of innovation diffusion theory in the 1960s, the service sector was far less developed than the product one. The advent of the internet in the 1990s was an incredible catalyst in developing new innovative services and aroused interest in the topic. Three kinds of services exist (i.e., subscription services, on demand services used several times in a medium/short period of time, and on demand services occasionally used over a long period of time); and three types of diffusion models are recognisable in the literature (i.e., Bass-type, Choice-type, and Grey models). In particular, Bass-type models require to collect given data and apply related metrics according to the kind of service under analysis. Hence, the thesis proposes a simple framework to choose the best-suited metric when the diffusion of a given type of service is under investigation.

'Diffusion' theories have been investigated together with 'adoption' theories since the 1960s. The adoption process has often been described as one of the diffusion process stages; in particular, it is the last one after awareness, interest,

evaluation, and trial. However, as diffusion dynamics differ, the adoption process differs from products to services too.

The idea here is to investigate the factors behind adoption from an Engineering Design perspective. Firstly, a model to anticipate the market appreciation of innovative consumer products as a function of design decisions was presented. For analysis purposes, design decisions here represent functional modifications that occurred between two subsequent product generations and have been categorised in twelve variables.

However, this approach may result to be difficult to apply in service contexts. Indeed, contrary to products, services are usually characterised by intangible elements. The adoption of industrial designed products may represent an intermediate step since it is usually linked to elements related to the experiential process (e.g., affordance).

A model to anticipate the market adoption of innovative industrial designed products as a function of design decisions was presented. Again, design decisions represent functional modifications, and, indeed, the novelty lies in studying whether and to what extent functional features affect adoption when elements other than physical and technical ones usually drive these dynamics.

The analyses to develop the model were carried out on data from the surface material industry. The latter, even if it is a semi-finished products industry, has features that allow equating products from this industry to industrial designed products. Indeed, surface material industry products give some of the most important properties to the end products to which they are applied (e.g., countertops, chairs, cabinets, desks).