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Exaptation and Innovation in Architecture: The Case of Chicago's Millennium Park¹

Millennium Park is a multi-awarded, 475\$ million total, innovative urban park completed in 2004 in Chicago. The interesting organizational aspect of Millennium Park is the process through which the innovative design of this park emerged out, totally unexpected, from a much more traditional design envisioned in the earlier stages of the design process. The park design was initially conceived as a classic *beaux-arts* garden in continuity with Chicago's local aesthetic repertoires, and later turned into the outdoor art museum of today, emphasizing global *avant-garde* architecture, interactive monumental sculpture, and contemporary landscape designs.

A longitudinal case study of the design process of this project (Furnari 2009) has shown that this radical design change was triggered by *aesthetic exaptation events*: instances in which the aesthetic features previously envisioned for a design function had been re-functionalized for a new design function. In the context of the case, an aesthetic feature is represented by the aesthetic repertoires and design styles used by an architect or artist. For example, the aesthetic repertoires defined by architect Frank Gehry (aesthetic feature) were initially selected for the design of a sculpture on a music band-shell to be located in the park (design function at origin) and later used for the design of a larger and more complex performing arts pavilion (new design function).

The case study shows that exaptation events can be produced by the combination of two basic types of cognitive processes. The first is a process of establishing relations among different sub-problem domains. In the context of the case, the sub-problem domains are represented by the different "topics" into which the project team divided the larger task of developing the design of the park (e.g. the "problem" of the project). Specifically, the team identified three sub-problems or topics: 1) selecting garden landscape designs; 2) selecting artworks; 3) finding the private funds to support the selected designs. Although each of these sub-problems was assigned to a different specialized committee, crucial brokers between these committees envisioned and made new connections among them. For example, they started seeing the artworks selected in one committee in the context of the garden landscapes selected in another committee and discussing these different topics together. In turn, this process of establishing new connections among formerly disconnected sub-problems gave rise to new interdependencies among the aesthetic features selected for the park design. These

¹ This short case is published in Grandori A., Gaillard Giordani L. (ed.), 2011, *Organizing Entrepreneurship*, London: Routledge, p. 37-38.

unexpected interdependencies constitute an important antecedent to the exaptation of these features.

The second set of cognitive processes leading to exaptation consists in the re-interpretation of the relationships connecting the parts that had been combined together. This re-interpretation is described as a process of *re-framing* or *changing the perspective* –e.g. the representation of the overall problem itself- from which the relations among the parts are perceived and evaluated. The project team of Millennium Park interpreted the interactions among the aesthetic features via visual maps and models projecting the overall design of the park. In these maps and models, each aesthetic feature was applied to different geographical areas of the park, bounded and separated among them by walking paths. These walking paths were used by members of the project team as *visual interfaces* to interpret the relations and interactions among the aesthetic features. Specifically, by visually manipulating the maps and by experimenting with the existing paths, the team started drawing and imagining *new lines* connecting the areas of the park. Through this process, the team perceived and started discussing new connections among aesthetic features and design functions, thereby discovering new functions for aesthetic features that had been previously selected for different purposes. In the Millennium Park case, aesthetic exaptation originated from the manipulation of the interfaces connecting features and functions. Interface manipulation allows the discovery of new perspectives from which the relations among features and functions can be re-interpreted and re-framed.

Overall, the case study shows that in design, like in biology, innovation-by-exaptation can be usefully contrasted to innovation-by-adaptation, which assumes evolution of the structure of a feature towards better function. In contrast, exaptation describes the unforeseen connection between an existing feature and a *new* function, different from the function for which the feature was originally designed or selected for (Gould and Vrba 1982).

Furnari, Santi (2009) “*Mechanisms of Aesthetic Exaptation in Architecture: How a Beaux-arts Garden evolved into an Avant-garde Art Park*”, paper presented at the XXV EGOS Colloquium, July 2-4, Barcelona, Spain (Winner of the EGOS 2009 Best Dissertation Paper Award).

Gould S. J. and Vrba E. (1982). “*Exaptation: a missing term in the science of form*”. *Paleobiology*, 8(1), p: 4-15.