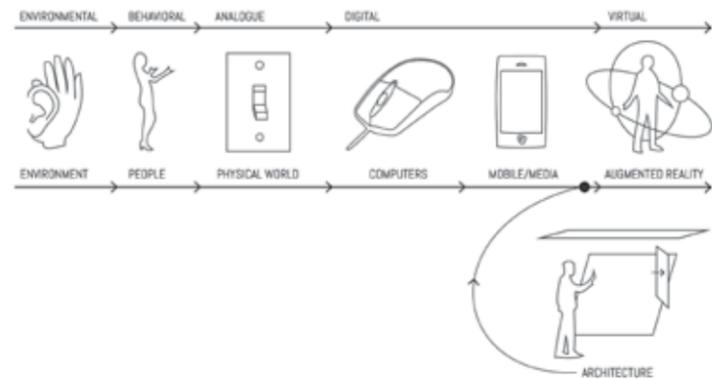figure 12
The evolution of gestural language.

figure 12

Exciting possibilities exist for augmented reality to include gestural languages which evolve into a type of dance which affects or transforms the surrounding environment (physically moving building components) without physical labor, while actually improving the body-space relationship that voice control and similar techniques continue to threaten. This relationship is extremely important in architecture and the world—people have a natural tendency to manipulate their surroundings through touch. The experience of architecture may be at first, and primarily, visual, but it is secondly and most crucially physical. We use our eyes to experience an architectural composition in 2D, almost like a painting. However, the most engaging experience of architecture comes as the eyes negotiate distances, proportions, and materials in relation to the body. This is a physical relationship and is always subsequently verified by movement through and physical interaction with the building components. Interaction, or "play," with the physical world is crucial to the way humans learn to socialize and understand reality. The next phase of gestural languages to control interface devices, and eventually the entire built environment, should reflect this relationship and ideology.

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CROWDSOURCING ARCHITECTURE:
A DISRUPTIVE MODEL IN ARCHITECTURAL PRACTICE

ABSTRACT

This paper discusses the use of crowdsourcing as a new approach for architectural design acquisition. We will give an overview of the concept of crowdsourcing, and elaborate on its particular application in architecture via concrete projects executed on Arcbazar, a first-of-its-kind crowdsourcing platform for architectural design services. We argue that online crowdsourcing platforms can have an immense impact on smaller-scale design challenges, e.g., home remodeling projects and landscape and interior design challenges, and can potentially carry these often neglected projects into the architectural design sphere. In this paper we will discuss the methods and techniques of architectural crowdsourcing and illustrate the processes and outcomes through a series of projects: a remodeling project for a closet; an interior design challenge for a dining space; and a layout problem for an apartment complex. We will then evaluate the protocol and outcome of architectural crowdsourcing, and convey the professional and popular media response to this new method of architectural design acquisition.

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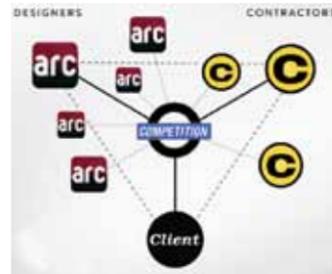University of Hartford

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1 INTRODUCTION

Throughout history, design competitions have been an integral part of architectural production—from the Parthenon, to the Hagia Sophia, to medieval churches and the Freedom Tower in New York City. All these projects utilized the collective design intelligence of architectural designers through a competition protocol. With the advent of the internet and advanced information technologies, these protocols have been adapted to online crowdsourcing platforms, where for the first time smaller-scale projects can make use of the fair competition process.

The traditional model of architectural design acquisition is for almost all smaller-scale projects inefficient, unaffordable, and unattainable. According to IBISWorld's Industry Report, the total design services billed by architectural offices in 2011 were $42 billion. This amount was carved out from $330 billion of construction expenditures. However, according to the US Census Bureau the total expenditures on construction projects were about $800 billion the same year, consisting of remodeling, residential, commercial, and institutional projects. Considering that the total opportunity for architectural design services is on average 8 percent of the construction cost, the amount should add up to about $64 billion. The difference between the actual billed architectural services and the maximum opportunity is a staggering $22 billion. This untapped market consists mostly of smaller-scale remodeling projects, which never get into the world of architectural service providers.

The reason why a large number of potential clients do not pursue architectural design services is, firstly, due to the circuitous way of finding an architectural designer, i.e., clients often find architects via word of mouth, or through family and friends; secondly, the relatively higher fees of service providers, which can range between 10 and 15 percent of the construction cost; and lastly, the prevailing fear that after all of that hardship and cost, clients may or may not like the singular product they get from one designer. Therefore, most clients bypass the architectural design sphere altogether and directly use the services of local builders and contractors, or simply do it themselves.

In this paper, we will present architectural crowdsourcing as an alternative method to traditional design acquisition, which can potentially overcome the abovementioned shortcomings and bring smaller-scale projects into the realm of architectural practice. We will analyze and evaluate concrete examples executed through Arcbazar, an online crowdsourcing platform that was launched in the summer of 2011 in Cambridge, MA.

2 BACKGROUND

In June 2006 Wired magazine featured the groundbreaking article by Jeff Howe, "The Rise of Crowdsourcing," in which Howe coins the term "crowdsourcing" from the combination of the words "crowd" and "outsourcing" (Howe 2006). It defines a method that utilizes distributed people to help accomplish a particular task. For example, Wikipedia uses crowdsourcing to establish its extensive web content. In these and similar crowdsourcing projects, masses are invited to propose and even assist in developing a new product or service, refine a design, compute or derive various algorithms, or assist in providing, arranging, or evaluating significant quantities of information into viable data. As a concrete example, EnterpriseWorks, an international nonprofit organization out of Washington, DC, needed ideas for "low cost rainwater collection systems" to fight the lack of access to clean water resources in developing countries. For this purpose they launched a challenge at innocentive. com, a crowdsourcing platform for science and engineering problems. They set their award at $15,000 and within 60 days received hundreds of solutions to their problem from around the world. InnoCentive's platform enabled EnterpriseWorks to solve a seemingly unsolvable problem at an affordable cost—potentially transforming the lives of millions in the developing world.

In architecture, crowdsourcing design problems is actually not a novelty. Wealthy clients or government agencies have always solicited multiple design concepts for significant projects throughout history. Competitions among architects facilitate the generation of innovative design concepts, stimulate public debate, and generate publicity for the project at hand. However, clients with smaller-scale

projects could not afford the expensive, time-consuming, and often highly regulated protocols of conventional competitions. This is where online crowdsourcing platforms can make a great impact, and offer smaller-scale projects access to competitive and affordable design solutions.

3 CROWDSOURCING ARCHITECTURE

As part of this research an interdisciplinary team of architects, computer scientists, and business developers launched a crowdsourcing platform to explore the potential opportunities of crowdsourcing in architectural design (Figure 1).

In this scheme the crowdsourcing system is a tetrahedron comprised of clients, designers, and contractors. It is based on a dual crowdsourcing protocol, where the design is first crowdsourced to architectural designers, and then the design's physical execution to local builders and contractors. In this constellation, the project constitutes the top of the tetrahedron, networking the triumvirate of clients, designers, and contractors.

3.1 The Protocol

In a nutshell, clients post a project brief and set up their evaluation criteria, their deliverables list, a deadline, and their project prize. Designers then review the project, sign up, and submit their design concepts. After the deadline, clients rank the top three projects, and the system distributes the award money among the winners. As in traditional competitions, the platform distributes aliases, which ensures the privacy of designers. This integrated feature allows designers to remain anonymous, while at the same time it assures that the eventual ranking is merit based. During the competition process, clients and designers can communicate anonymously through a public wall on the project page.

4 THE IMPLEMENTATION

We will briefly describe three case projects: a closet design for a homeowner in Natick, MA; a dining space arrangement for a tenant in Malden, MA; and an apartment building for a developer in Turkey.

4.1 Case 1: A Closet Space

The first project completed on the platform was a remodeling project for a difficult closet space in a teenage girl's room. The closet had a slanted roof, and the client wanted to see whether a portion of the closet could be appropriated as a study desk for her daughter. The client launched a competition, uploaded a few images, drew the layout, and put up an award of $150 (Figure 2).

Four designers signed up for the challenge and two submitted: a recent graduate architect from Pennsylvania, and an architectural student from India (Figure 3). This project vividly exemplifies building challenges that would never cross the table of an architectural office, because of their miniscule project size and low budget.

figure 1
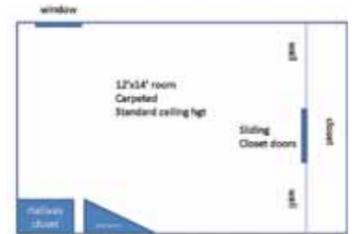Scheme of dual crowdsourcing platform. olution for a closet space by R.D.

figure 2
Competition for a closet space. Left: plan drawing by client; right: image of the closet.

figure 3
Winning design solution for a closet space by R.D.

4.2 Case 2: A Dining Space

In this second example, a client crowdsourced the design of a dining space that was located in an unusual apartment layout. Although there was extra footage in the kitchen area, it was not enough space to create a spacious dining area. The client launched a competition and received five design submissions from Indonesia, Serbia, Spain, India, and the US (Figure 4). The winning design solved her peculiar layout problem.

4.3 Case 3: An Apartment Building

A developer in Turkey had a tricky building lot, i.e., a lot that was open on three sides to streets but closed on the fourth side because it abutted a neighboring building (Figure 5).

It seemed impossible to provide natural light for all rooms in all four apartment units. The client uploaded images, dimensions, and a project brief, and received 21 design solutions from around the world (Figure 6). The collective design intelligence offered a solution to a seemingly unsolvable and wicked space problem.

4.4 Beyond Residential Projects

Our research initially targeted small-to-medium-scale architectural projects; however, the crowdsourcing platform demonstrated success at larger-scale projects as well. It was able to implement commercial and institutional projects. It successfully completed an office space, a parking lot, and a dog-care facility, among many other projects. Also, institutional projects were effectively executed, such as a community library in Maryland and a redevelopment project for a vacant school building in Somerville, MA.

In the latter case, the city launched an eight-week competition, and remarkably, 80 designers from across the world signed up and worked on this long-neglected area in Somerville. The final submissions were evaluated via an online polling system by a Somerville focus group. The process set an exemplary protocol for transparent evaluation methods in architectural crowdsourcing.

The World Bank noticed the effectiveness of the Somerville project and is working on fighting poverty in the developing world through similar crowdsourcing procedures. Arcbazar's competitive crowdsourcing model can morph into a collaborative engine, where designers, experts, the larger public, and even builders may work together throughout the entire process. Collaborative crowdsourcing platforms can offer city officials a sustainable and low-cost alternative in obtaining architectural design services, and provide communities with a steady way of responding to pressing urban design needs. They can help cities circumvent the often expensive, circuitous, and time-consuming bureaucracy required for any public project. In short,

figure 4

figure 5

crowdsourcing platforms can project the collective design intelligence and expertise of architectural designers and help communities to rapidly develop and improve their physical environments; to fight the spatial ramifications—and oftentimes the causes—of urban decay and poverty.

5   CONCLUSION

Since the launch of Arcbazar in July 2011, we completed around 100 projects—from remodeling projects, to landscape and interior design projects, to new residential projects and nonresidential design challenges. On average each crowdsourcing project received about 9.5 design submissions. Arcbazar received mixed reactions from the popular and professional media. The San Francisco Chronicle, on February 23, 2012, called it "… a better architectural environment for the crowd by the crowd." The Boston Herald praised Arcbazar as a new way to acquire architectural design (Snaniszlo 2012). Thousands of tweets applauded Arcbazar's beta launch; one comment stated, "Brilliant. The logic of crowdsourcing applied to architecture." And the World Bank marveled at the Somerville redevelopment project as an innovative approach in solving pressing urban planning needs (World Bank blog 2012). However, the platform was not without controversy. It has received substantial criticism by the professional media. Dwell Magazine, America's leading home and architecture magazine, called the launch of Arcbazar "the worst thing to happen to architecture since the internet started." This statement caused many heated debates among architectural bloggers worldwide. The Architects' Journal published an article on the disruptive model headlined: "Architecture crowd-sourcing website criticized: Architects have slammed a threatening new crowd-sourcing website in the US which promises to reduce clients' costs" (Fulcher 2011).

However, the goal of this project was not to challenge existing job opportunities or devalue design services. On the contrary, our aim was to expand the architectural design market and offer an alternative path to clients who are not able to access exclusive design services: an online platform, where any scale and type of project—from a closet space to urban design problems of the developing world—can make use of the fair competition process.

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figure 6

figure 4

Left: layout showing space problem in dining area. Right: dining space solutions, from top to bottom: J.A., Indonesia; N.S., Spain; S.A., Serbia.

figure 5

Lot with natural light problem. Left: site plan; right: view from north.

figure 6

Crowdsourcing project for an apartment complex. Eight of the 21 design entries.