ARCHITECTURE FOR THE CROWD BY THE CROWD: A NEW MODEL FOR DESIGN ACQUISITION

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ABSTRACT
This paper discusses the use of crowdsourcing as a new approach for architectural design acquisition. We argue that crowdsourcing can have a vast impact on smaller scale design needs, e.g. home remodeling, or landscape and interior design projects, and can potentially carry these often neglected projects into the architectural design sphere. In the US alone, there are about 15 Million smaller-scale projects of which only 11% make it to the hands of a professional designer. The remainder of projects - accounting for a staggering $170B in construction expenditures- is implemented with a contractor or done by the clients themselves.
What are the reasons behind this discrepancy in high "desire and need" for design and the few projects that have professional design? The causes are manifold, and can be termed as "the customer pain:" a. architectural offices are not easy to access; b. there is a perceived high cost associated with professional design work; and c. the high risk of a single solution that cannot meet the client's expectations. In order to address some of these real or perceived discontinuities in the design/construction project flow, we developed Arcbazar, an online crowdsourcing platform for architectural design. The platform, born within the Venture Mentoring Service (VMS) Program at MIT (Cambridge, MA), has now successfully completed about a thousand projects worldwide; and collected hundreds of thousands of visuals, conversations, audio-video files, and related visual graphic material from designers and clients around the globe. Here, we will analyze the massive design data generated over the last five years of Arcbazar, discuss methods and techniques of crowdsourcing, and illustrate one case study with overall analytics of the platform. We will then evaluate the protocol and outcome of architectural crowdsourcing, convey professional and popular media responses, and argue for its potential to disrupt traditional architectural practice.

INTRODUCTION
Throughout architectural history, competitions were commonly run as a method to generate designs for major public buildings, such as temples, churches, mosques, town halls or other communal edifices and monuments. The earliest competition known to date was run for a war memorial in Athens, in 448BC. By the end of the competition, the council of Athens displayed the results for ten days at the Acropolis and asked citizens to cast their vote on the concept they wanted to see implemented. (Kaplan, 1988) Unmistakably, Greeks understood the power of public participation in decision-making processes for public projects. Engaging the community in the process not only evaded potential criticism, but also sourced valuable opinions to gather best ideas for a given spatial problem. In the Renaissance, competitions became a favored instrument to resolve wicked design challenges. In 1419, for instance, the winning concept for the Dome of Florence presented by Filippo Brunelleschi was a brilliant double domed design solution for a seemingly impossible design problem. How can this proven, age-old modus operando of competitions be leveraged in the digital age? Can we use technologies to improve upon the competition protocol and build a more participatory, transparent and democratic process? Can we generate a new model of design acquisition able to respond to all types of spatial design challenges - even at very small scales?
To explore these and other questions, we founded Arcbazar- an online competition platform to evaluate in-real-time the impact of crowdsourced architecture on everyday design. Dwell Magazine has called Arcbazar "the worst thing that happened to architecture since the internet started," (Dwell, 2011) with the argument that such platforms devalue architecture. Is crowdsourcing a race to the bottom – a misuse of power – or is it a fair and transparent process opening up equal opportunities to designers around the world? We content that online platforms are revolutionary and offer a level playing field that allows participants to test new ideas in low-risk environments. These platforms become great grounds for exploration and creativity, while offering

project-owners a very diversified spectrum of unexpected options to meet different design preferences and expectations.

1. BARRIERS OF DESIGN ACQUISITION

There are about 15 million smaller-scale design projects each year in the United States, and 89% of them never see the desk of a designer let alone a competition. (US Census Bureau, 2011) The reasons are manifold, and the problems are fundamentally different for project-owners compared to designers.

From the project-owner's point-of-view, the main problems are: a. the availability of architects is often limited locally and engaging them is intimidating; b. design commissions can become relatively expensive, especially for their domestic project that are often very small; and c. approaching a single designer is perceived as risky, since the outcome is not always clear and predictable. Moreover, from a legal perspective, smaller-scale projects often do not need the work of a licensed architect; for example, in Massachusetts, anyone can design their own home - if it is up to 44,000 cf. The majority of project-owners, therefore, skip the trip to the architect's office altogether.

From the designer's point-of-view the main issues are: a. the problem of intellectual property; b. fairness of compensation; and c. fairness in evaluation protocols.

1.1 The question of intellectual property

In the 16th century, Philip II, King of Spain, launched a competition for the monastery at Escorial in Madrid, and asked Italian architect Giacomo Barozzi da Vignola to evaluate the 22 entries that were submitted. Vignola, however, instead of deliberating on a winner, decided to put together his own scheme by collaging "bits and pieces" from all entries. King Philip was very happy with his design and commissioned him the job. (De Haan, 1988) This is a nightmare scenario for every designer. "Stitching" ideas in this way is certainly not legal or ethical nowadays. However, one could argue that decomposing projects and recombining them in a different way may lead to the most ideal solution for a given problem. Can there be practical and legal ways for designers to participate, share and collaborate towards a collective design outcome? What are the required intellectual protections in such cases? In traditional competitions, teams or individuals beat one another; this is the nature of the process. The challenge is based on prescribed rules and regulations. However, even in best-case scenarios, there is only one winner and the remaining designers are, by definition, on the losing end. In other words, all, but one winner, experience some sense of disappointment and disbelief. What would happen if there were multiple designers part of a winning scheme?

1.2 The question of compensation

The chance of a designer getting his or her vision translated into built-form through a competition is very low. Therefore, people often get surprised by the fact that architects work on competitions at all. Louis Kahn claimed that competitions are an offering by architects to the larger community, because the majority of projects never get built and architects not paid. (Lipstadt, 1989, p.10) Nonetheless, the answer to this puzzle is more complex, and many of the reasons why architects work on competitions can be partially explained on historical, sociological, economical, and psychological grounds. For some designers, the motivation is perhaps to use competitions as a means of marketing, i.e. to connect with project-owners for potential commissions. For others, it may be to strengthen their portfolio and to put their name out in the world. For most designers, however, design is a passion, which can be explained by the concept of urges or drives in motivational psychology. Adolf Loos claimed that any creative act serves the sublimation of the creator's urges, and therefore performs functions beyond its apparent value proposition. (Gleiter, 2008, p.76) Loos's argument - originally made against ornament- may also explain why designers participate in design challenges at all: competitions offer fierce battle grounds for "creative acts" to outperform others. However, good performance does not always equal "winning" a competition. Traditionally, there is always one winner, one runner-up, and a third place. Often organizers issue honorable mentions to few projects that were well done but did not make the final cut. Could awards be distributed in an even more equitable way?

1.3 The question of evaluations

Evaluations of competitions are highly subjective and, therefore, traditional competitions turn often into launching pads for intrigue and controversy. Almost every competition goes through some extent of confrontation, and issues of conspiracy and quarrels can unfold. Customarily, projects are evaluated by a board of reviewers, called the jury, which may consist of architects, academics, politicians, and bureaucrats. Evaluating projects as part of a jury requires team play, but often opinions are very diverse and agreements cannot be reached. On the other hand, if all jury members think alike, there is no room for innovation. Many times, also, the tiniest non-issues can gain disproportionally on significance. For example, in the competition

for the League of Nations in Geneva, in 1927, Le Corbusier's entry was not chosen as the winner because one of the jury members pointed out that the drawings were not drawn in ink, as outlined in the project brief. (Gold, 2013, p.58) And, other times juries can become more flexible, as in the Sydney Opera competition, Jorn Utzon's winning design did not meet the program; and Zaha Hadid's proposal for the Tokyo Olympic Park exceeded the site boundaries. The architectural direction of a competition is also often predetermined by the jury selection. In 1922, the Chicago Tribune Tower resulted in a neo-classical building, and all participants knew from the beginning that the style was the pre-set choice of the jury. Similarly conspicuous, the head of the competition jury for the Kocatepe Mosque in Ankara, Turkey, in 1967, asked participants blatantly to design in the classical Ottoman style: "Istanbul resembles a rose-garden in regard to mosques; the architects should make a bunch of it [for Ankara] that every visitor could admire." (Yilanlioglu, 1987) Can evaluations become less biased, and the protocol more transparent, democratic and participatory?

2. DESIGN ACQUISITION THROUGH CROWDSOURCING

Digital technologies can help respond to many of the question raised above. One of the solutions we put forth is the use of crowdsourcing platforms for architectural design projects. At Arcbazar, project-owners can quickly launch competitions through an easy onboarding procedure. They describe their projects, set their criteria, and decide on deliverables, award amount and duration. Designers choose whether they want to participate in that particular design challenge or not. At the deadline, the project-owner reviews all submissions and issues the awards. The anonymity of designers and clients are strictly enforced in order to keep the competition fair and the outcome merit-based. The methods and techniques developed at Arcbazar to grow the competition eco-system are: 1. measuring designer performance; 2. facilitating collective designs; 3. enabling two-staged competitions; and 4. supporting evaluations of projects.

2.1 Measuring Designer Performance

One of the most important aspects in developing strong online communities is to allow participants to build-up a record. Arbazar thus issues various points to designers for their actions on the platform, and ranks them by their performance on several charts. There are also sub-charts for particular fields, such as Top 50 of Landscape Designers, Top 50 of Interior Designers, etc. Points are given for winning a competition, becoming in second or third, or receiving an honorable mention. Points can also be collected for uploading projects, signing-up for competitions, voting on design projects; or, points can be subtracted, for signing-up to a competition but failing to submit. The point-system not only works as a strong retention tool for designers, but also incentivizes them to become prolific members for the larger community. Currently, the number #1 designer of the platform is Gordana Vujasevic, from the United States. The designer collected 83,065 points, and participated in 229 competitions, winning 46 1st Prizes, 38 2nd prizes, and 28 3rd prizes.

2.2 Collective Design

2.2.1 Designer exchange module

An exchange module allows designers to share files related to a particular competition. Designers can share their work a. for free; b. sell it for a particular amount; or c. ask for future equity in the case the person using the file wins a monetary award. For example, if designer A produces a base drawing, and designer B uses the base drawing, and if Designer B wins the competition (and only if s/he does), Designer A gets also some monetary award based on the agreed upon equity. The work offered for exchange can range from drawings to environmental consulting, engineering input, partial design solutions, or any other project-related assistance. Designer A, in this way, could theoretically become part of multiple teams that agree on the terms put forth. Designers who do not have much time at their hands, or lack expertise in certain areas, can still add a "brick to the wall," and potentially become part of a winning team. In this way ad-hoc teams can be construed from around the globe.

2.2.2 Forming online teams

Arcbazar developed a feature which allows designers to form ad-hoc teams. These can be long-lasting, or just project-based teams. In this way, teams can be formed on equity. The shares do not have to be equal but can be distributed proportionally according to the projected input of each team member.

2.2.3 Derivative design ability

Crowdsourcing also allows iterative models. The iterative process occurs through two-staged competitions. In the first phase, all designers submit their designs and the projects are evaluated and ranked. In the second phase, all designs are open for partial use by any other participants. The knowledge produced in the first stage

is thus not lost but developed further. In other fields, such as science, multiple authors can contribute towards a single paper, and the order of authors reveals the weight of each individual in the work. In a similar way, in this model, the project entries are "authored" by designers based on their contributions. When, and if, the entry wins a competition, the award is shared according to the predetermined set equity. If the design gets built, a team of designers gets credited as authors. The model aims to harvest the collective design intelligence of participants through a fair and equitable protocol.

2.3 Two-staged Competitions

All projects on Arcbazar start as one-stage competitions. However, at the end of the process, the project-owner can decide to launch a second stage. S/he can then comment on submissions, and start the second phase either in a restricted mode (only open to the original rooster of participants, or select few of them); or, re-open it to the entire designer community. The second stage is often used by project-owners who want some major revisions, or more nuanced details for their projects.

2.4 Evaluation Modules

The final decision on deliberating top projects is reserved to the project-owner. However, a non-binding voting feature was integrated within the competition model. Arcbazar introduced three different evaluation mechanisms, i. evaluations by project-owners; ii. evaluations by family and friends; and iii. evaluations by platform users, e.g. other designers or clientele. The i. and ii. evaluation types have a more detailed module which allows them to comment and evaluate projects on following criteria:

1. Idea – was the idea great?
2. Aesthetics – is the design beautiful?
3. Function – does it work well?
4. Buildability – is it buildable, within budget, etc.?
5. Graphics – is the quality of visual material great?
6. Criteria - did it met set criteria?

Each item is judged on a 10-point system, with 1 being the lowest and 10 being the highest. For the iii type, the criteria are from point 1 to 5., and are done through a separate voting interface. Votes from each stakeholder, i, ii, and iii, are all weighted differently. A designer in the top 10 or top 100 charts has a higher voting score than a designer who just signed-up. Similarly, client votes count more than family and friend votes. The system averages all votes proportionally and ranks the submissions.

3. A CASE STUDY AT ARCBAZAR: CROWDSOURCING A COFFEE SHOP

Ali K. of Saudi Arabia launched a competition for a coffee shop in Sakarya, Turkey. Ali expected to find remodeling solutions for an existing vacant building on a site he owned. He provided a base sketch with rough dimensions, and images of the site, and set the award to $1,000 for a four-week long competition (Figure 1).

Ali's competition received 27 submissions from designers across the world. (See more data in Figure 3). The team headed by Marijana Maslovaric and Ivana Markovic, of Serbia, won the 1st Prize (Figure 2).

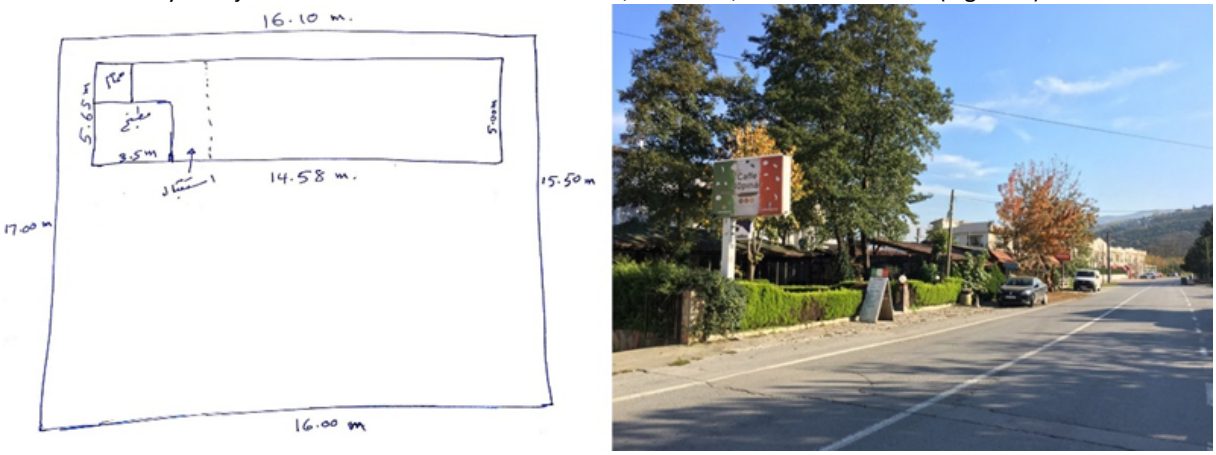

Figure 1. Sketch and photo provided by client Ali K.

Figure 2. Plan drawing and various renderings of the winning entry of the “Coffee Shop” competition. Design by Marijana Maslovaric and Ivana Markovic, Serbia.

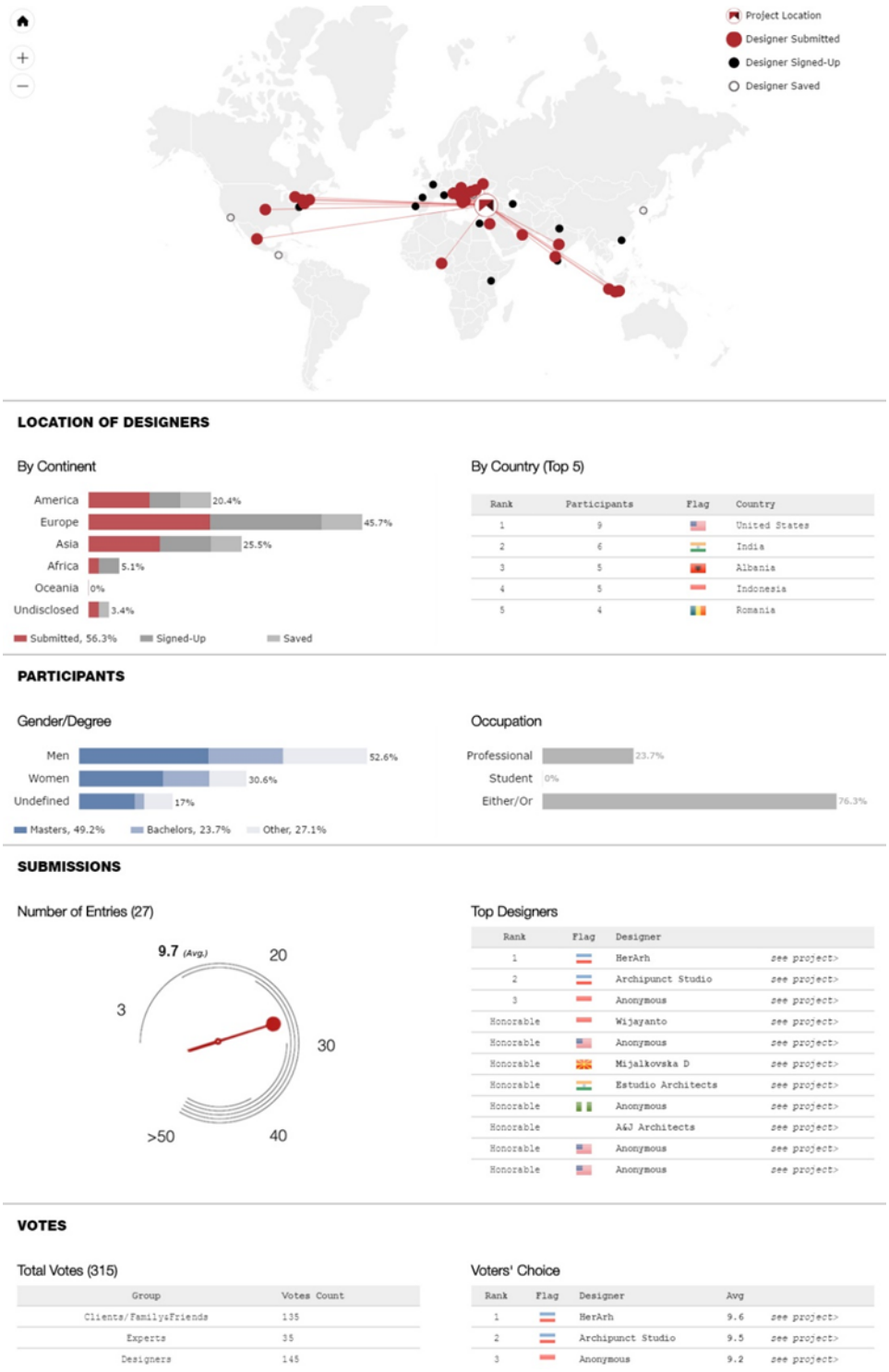

Figure 3. Analytics for the “Coffee Shop” competition.

4. RESULTS AND OVERALL METRICS

In total, we ran about 1,000 competitions, and 114,349 digital files have been uploaded onto the system. The average submission rate was 9.71 projects per competition, and each submission contained on average a dozen sheets, ranging from orthographic drawings, perspective renderings, axonometric views, text, audio-video files, to raw data, e.g. CAD drawings, 3D models etc.

4.1 Mapping Projects and Designers

Figure 4 shows the distribution of competitions and designers across the globe. Each competition is connected to participating designers with a thin line. The map reveals that the majority of competitions are within the US, whereas the majority of designers reside outside the US. Figure 5 depicts the overall analytics of the platform, and visualizes additional data-sets through different graphs. Top 5 countries where competitions were initiated were the US, followed by Australia, Canada, Switzerland and Saudi Arabia. Countries with most registered designers were the US, India, Egypt, Canada and Romania; and the countries with most winning designers were the US, followed by Albania, Romania, France and Bulgaria. 45,020 votes have been cast on individual projects, and 2,786 comments/feedback given by project-owners.

Figure 4. Worldmap visualizing locations of projects and designers

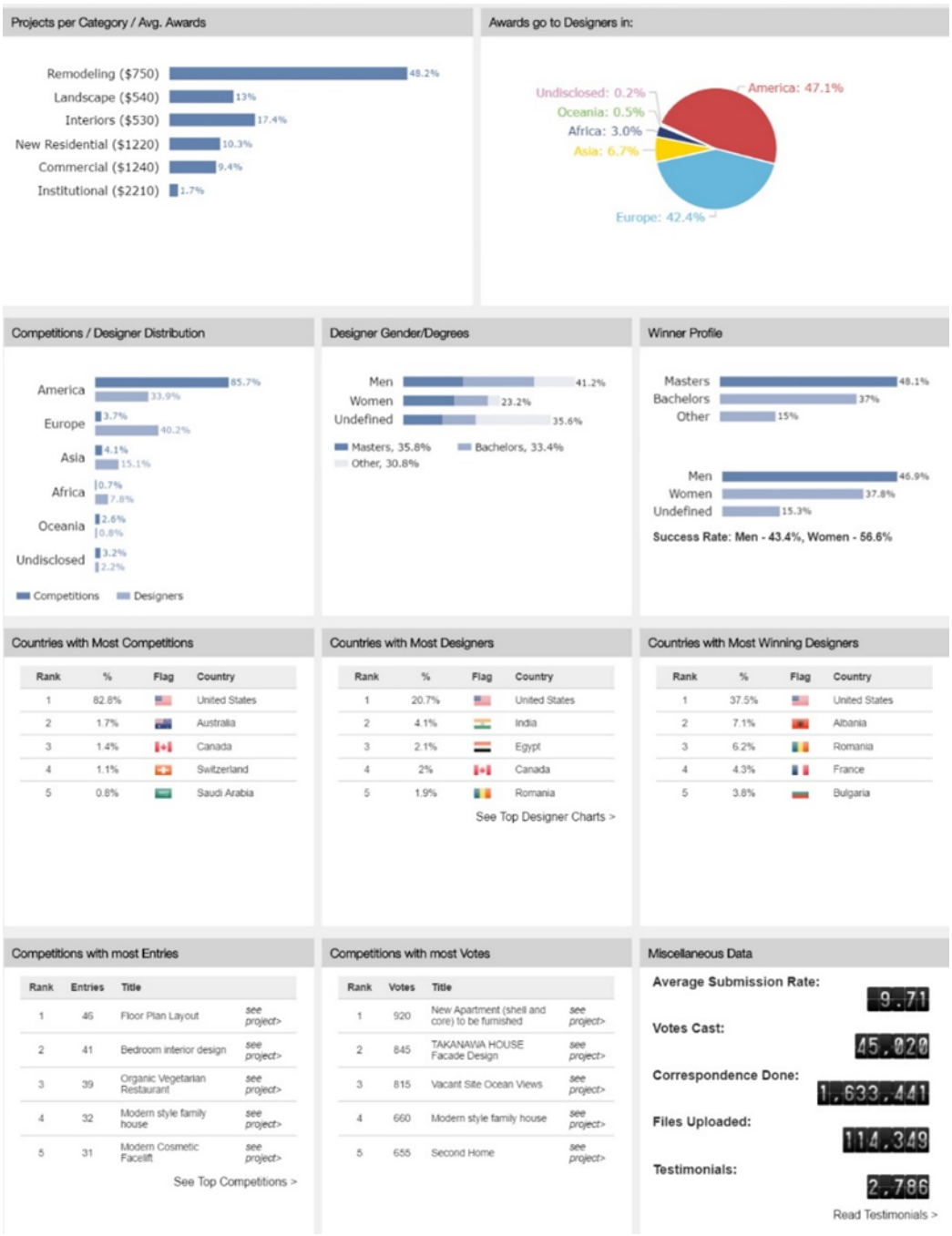

Figure 5. Various data points of Arcbazar in graphic form

4.2 Project Types and Awards

Arcbazar has six different project categories: 1. home remodeling-, 2. interior design-, 3. landscape design-, 4. new residential-, 5. commercial-, and 6. public projects. As seen in Figure 5, the majority of projects executed were in the home remodeling category (48.2%), followed by interior design (17.4%), landscape design projects (13%), new residential projects (10.3%), commercial projects (9.4%), and lastly public projects (1.7%). The average of awards from all competitions categories was $750, being lower for interior projects ($530) and higher for institutional projects ($2,210). Most of the awards went to designers in America (47.1%), followed by Europe (42.4%), and Asia (6.4%).

4.3 User Profiles

12,001 designers and 7,493 project-owners have registered on Arcbazar. 33.9% of designers reside in America, 40.2% in Europe, 15.1% in Asia, 7.8% in Africa. From all registered designers, 41.2% are male and 23.2% are female (the remainder of users did not identify gender). 35.8% of designers hold master's degrees, 33.4%

bachelor degrees, and 30.8% have identified as "other," holding other types of degrees such as diplomas, doctorate degrees etc. 46.9% of 1st prize winners are men, and 48.1% hold master's degrees.

4.4 Gender success ratio

Even though the winning profile belongs to men (46.9%), the winning performance belongs to women (56.6%, compared to 43.4% for men). Gender performance is calculated based on the winning ratio of genders related to their number of male/female participants (Figure 4).

5. CONCLUSIONS

Our research shows that there is an immense opportunity, and interest by project-owners to crowdsource their design challenges. We understand this fact through qualitative and quantitative data we collected from projects. 92.4% of project-owners turned out to be very happy, and 7.5% launched a second project, with 5% of them launching a third or more projects.

However, the majority of crowdsourcing projects on Arcbazar are located in the US (82.8%). Some reason for this imbalance of project distribution might be due to the fact that the platform is relatively new and has yet to be discovered around the world. However, there might be also language and cultural barriers in non-English speaking countries. Also, some countries, like Germany, have stricter regulations which poses peculiar challenges. For example, UBER, the popular car-ride company has been banned due to stricter codes for taxi drivers in Germany. Or, countries like China, intentionally slow-down access to US websites to protect their local companies; and make it thus very hard for designers and project-owners from China to use Arcbazar. In future, the platform needs to overcome these barriers and resolve many complex cross-cultural challenges, in addition to mundane issues like payment processing problems, server access issues, or multi-language interfaces.

In addition, the architectural profession also hesitated to embrace crowdsourcing right away. The Architects' Journal criticized Arcbazar, in "Architects have slammed a 'threatening' new crowd-sourcing website in the US which promises to reduce clients' costs." (Fulcher, 2011) And, the AIA Report of 2014 portrayed Arcbazar as a disruptive model for the concurrent architectural practice. But despite such criticism and practical hurdles around the globe, competitions will always be part of the architectural profession. Competitiveness is part of our human fabric, and the hope for self-realization very often drives great achievements. Crowdsourcing opens up the fair competition protocol to everyday design challenges, taps into the potential of an increasingly better connected world, and makes design acquisition more efficient, collaborative and participatory.

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