Carnegie Mellon

Small Undergraduate Research Grant (SURG) Proposal

Carnegie Institute of Technology, Tepper School of Business, Mellon College of Science

CREATING VIRTUAL MARKETPLACES FOR THE COMMODITIZATION OF RENTAL SPACES

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Abstract:

Our research team has identified specific difficulties and frustrations that prospective renters and property owners have encountered, whilst transacting over residential entities (i.e., houses, lofts, apartments, garages, parking spaces, etc). In 2009, following the brunt of the housing crisis, one of our very own team members (Zhijun) desperately engaged in the housing search, armed merely with such tools as "Craigslist.org", "CMU Misc Market", and "Rent.com" – none of which provided a satisfactory experience. The Craigslist and CMU Misc Market interfaces are extremely disorganized, such that users are only provided with limited information that is often incomplete and/or inaccurate anyway. Since the integrity of the information on Craigslist and CMU Misc Market is not verified, and users cannot hold the poster accountable, the student may end up walking into unsafe circumstances (property may not be owned by poster, poster has malicious intentions, etc.). The latency of communication on "Rent.com" is extremely high, since no information is readily available and since property owners must be contacted indirectly. Regardless of what tool is used, however, it is quite difficult to compare and choose between the best possible landlords, in the most desired search region.

We have formulated the aforementioned issues into specific metrics of analysis (see the bullet-points below), to which we will apply the mitigation strategies discussed later in this document (via software application development), while assessing how such variables as "distance from campus", "type of housing", "price", "area", etc. affect user tastes and preferences:

- The integrity and ownership of residential properties need to be verified, but often is not
- No interface exists, that enables (potential) renters and property owners to collaborate / transact virtually
- Little social interaction of any sort exists outside the immediate renter/owner/subcontractor relationship
- No metrics are in place to virtually gauge (or openly rate) the integrity of either party
- Individuals, firms, and institutions often have a surplus of (unutilized) parking spaces or structures
- No software framework exists that leverages government to automate housing verification processes
- No centralized utility enables users to harness community resources

Research Question and Significance:

Why do college students have so much difficulty in finding the "best" properties to rent, and how can this be resolved? This question concerns the market accessibility of college students – particularly graduate and upperclassman undergraduate students – to the residential entities that they desire the most. Implicit in this research approach is the necessity of first finding out what exactly such students desire. In doing this, we will able to (i) collect market tastes and preferences, (ii) package and aggregate the analyzed data, (iii) return this information to industry and (iv) develop proprietary software for innovation therein. We would measure the significance of this research venture on the basis of three attributes:

Impact on students (potential renters) – We wish to remove students from the time-consuming and potentially unsafe environments that they are subjected to while shopping for properties (e.g., via Craigslist, CMU Misc Market and Rent.com); we wish to ensure that the information students do obtain is accurate and complete.

Impact on residential agents (property owners and managers) – We wish to provide residential agents with information regarding students' tastes and preferences, to improve the quality of delivered services.

Impact on society (the local community) – We wish to commoditize both parking and temporary/high-frequency residential transactions, in an attempt to maximize property utilization throughout the city. We wish to provide an environment wherein both students and property owners may openly communicate and collaborate over properties, city infrastructure, and community events.

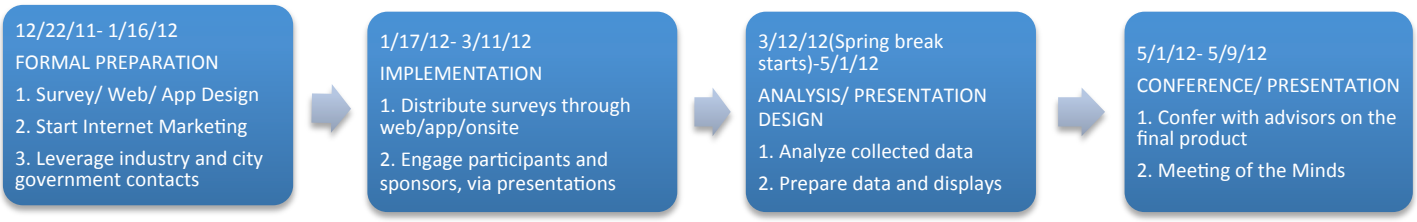
Project Design and Feasibility:

Based on the success of physical and internet marketing strategies that we have used previously, we will implement two survey campaigns, to ascertain user/firm tastes and preferences, surrounding the transactions of real-estate and parking properties. Through analysis, we may then determine the software solutions that would be valuable to both renters and property owners.

The first campaign (see optional rough draft: Appendix A) is directed to college students in Pittsburgh (Carnegie Mellon, University of Pittsburgh, and Duquesne University, Carlow University) that have searched, or are actively searching, for housing and parking space rental/subletting opportunities. The surveys we prepare will be the modes of entry for a city-wide electronics prize raffle, using one of Jon's entrepreneurship projects as a forerunner (originally branded "CMU Student Housing Study 2011" in preparation for this research initiative – http://franscape.com/shs2011); successful entry submission for each user will depend on the validity of responses and level of overall survey completion. Through this survey campaign, we will identify the difficulties students encounter during the search of rental properties, assess their interests and preferences, and evaluate the variables that would contribute to the most drastic improvement in the industry.

The second survey campaign is directed toward property owners and real estate agencies, that service specific neighborhoods of Pittsburgh (Oakland, Shady Side, Downtown and Squirrel Hill) and are interested software utilities (for automation, networking, and marketing), to assess their dissatisfaction concerning: (i) their own marketing campaign difficulties, (ii) the bureaucracy they struggle with in property ownership validation/verification, and (iii) the often risky/volatile circumstances inherent in financial transacting over properties. To distribute these surveys, we will leverage the industry and city government contacts we have already established: we will (i) continue to acquire sponsorships from them to have our survey material broadcasted through their marketing modes, (ii) we will establish partnerships to gain access to their market data, and (iii) we will engage in interviews and conferences with them, their affiliates, and their rivals.

Research Project Timeline:
Time for our research has already been appropriated on weekends and week mornings during the school year; we have experienced success with this arrangement and thus plan to maintain it. Moreover (as implied by the schedule below), academic breaks and vacations will be further dedicated to the success of this venture.



Background:
Jonathan Francis is a senior electrical & computer engineering (ECE) major, but is already pursuing his master's degree in the ECE concentrations of distributed embedded systems and robotics. He has expertise in industry, entrepreneurial, and academic research and is currently researching under Professor Priya Narasimhan in the *Intel Science & Technology Center for Embedded Computing* at Carnegie Mellon. Additionally – from establishing his own development company from the age of 13 – he has developed skills in the following areas: web / systems / application software development, internet marketing, and analysis of internet market statistics.

ZhiJun Huang is a junior economics & mathematics major. Having taken a series of statistics, mathematics, and economics courses at Carnegie Mellon, she has developed a very rich, multi-disciplinary academic background. Through this challenging coursework, she has gained experience in the realms of qualitative analysis, analytical thinking and economic scrutiny. Additionally, through extracurricular activities starting at the age of 16, she has developed skills in project management, advertising, and fundraising – by founding 3 projects (library reconstruction, laptop sponsorship, general service activities) that generated over $25000 in capital for earthquake relief in Sichuan, China.

Kenneth Wong is a junior mathematics major. Kenneth has gained business, accounting, and operations experience through various mathematics, accounting, and statistics coursework at Carnegie Mellon. Moreover, throughout his studies, he has specifically acquired expertise in probabilistic modeling and high-volume data analysis from his work in the ITRI research institute in Taiwan and from his role as an Assistant Business Manager for "The Tartan" CMU Newspaper.

Feedback and Evaluation:
Our formal advisor is Dr. Carol Goldburg – *Director of Undergraduate Economics Program, Associate Professor in Economics at Carnegie Mellon.* This professor will coordinate weekly conferences with us, concerning our progress and on-going research strategy; she will connect us with other interested faculty members and industry points of contact.

Dissemination of Knowledge:
Researchers will utilize the collected data to generate specialized market trend reports for property owners that intend to sell or rent-out their properties. These reports will be distributed via online blog posts and research report documents. Researchers will develop a distributed software utility to aid both property owners and renters in their own marketing campaigns, research, and financial transactions; we will also leverage our contacts in city government to develop automation software utilities that improve property verification processes. Product managers will use the findings to screen concepts to aid us in further product development and generation of research surveys. The final presentation will be given in the form of (i) a comprehensive research paper, (ii) conference talks (as they become available), (iii) Meeting of the Minds presentation, and (iv) web/mobile applications.

Budget Allocation:

SURG Project - Creating Virtual Marketplaces for the Commoditization of Rental Spaces
CMU SMC# 1853, 5032 Forbes Avenue, Pittsburgh, PA 15289-1623
Point of contact: Jonathan Francis, 407-385-0546, jmf1@andrew.cmu.edu

Budget Total (After Tax = 7%)		**1197.51**	
(Before Tax)		**1119.17**	

	Quantity	Subtotal	Comments
Office Supplies			
Coloured Pens	1 Pack	10.34	Drafting Ideas
Whiteboard Marker + Eraser	1 Set	19.88	Conferences and Posters
Poster Boards	2	28.98	Poster Display
Poster Easels	2	67.50	Poster Display
Advertising Cards	250	19.59	Distributing Information Relating to Project/Survey
White/Coloured Letter Sized Paper	300	41.97	Survey Print Out and Business Mails
Black and Colour Printer Ink	1 Pack	105.95	Survey Print Out and Business Mails
Office Supplies Total		**315.23**	
Marketing:			
Prizes for Survey Participation	2	328.00	Incentive for Participation (1 i-pod nano i-touch)
Marketing Total		**328.00**	
Development:			
Domain Name	1	9.00	($9.00/year) Project Presentation
Web Storage	1	42.00	($7.00/month for 6 months) Data Storage
Android Phone	1	229.99	App Testing
Development Total		**280.99**	
Logistics:			
Postage	Varying	22.00	Send Out Actual Surveys and Business Mails
Gas Money	Varying	172.95	Drive to Universities to Obtain Responses
Logistics Total		**194.95**	