Playful Laundry: A Gamified Laundry Booking System

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ABSTRACT
This paper describes the approach of gamifying traditional reservation systems for shared facilities in order to improve user experience and usage effectiveness. In particular, we apply the solution to enhance dormitory laundry room usage and present Playful Laundry which is a gamified laundry booking system. Similar to any reservation systems, Playful Laundry allows users to reserve washing machines and manage their bookings on mobile phone. Moreover, the system also sends reminders of upcoming booking and finished jobs as well as provides a real time status observation and usage statistics of the machines. Finally, by using game elements: levels, points and leader-board, the systems brings users into playful experiments and changes their behaviors toward efficiently using of the machines.

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Gamification; Laundry Booking System; Reservation System

INTRODUCTION
Reservation systems are software systems that store and retrieve information about services or facilities and conduct transactions for booking them [8]. These systems are most commonly used by airlines or travel agencies to book flight tickets, hotel rooms and lodging facilities. In recent years, there has been a growing trend in sharing ownership of cars, bikes or some other infrequently used assets as a way to avoid paying for such rarely used facilities. In fact, shared-use vehicle systems [5, 1] has attracted a great deal of interest due to their benefits to the users and environment. Similar to reservation systems, these shared asset management systems not only keep track of resources status and people who are using them but also resolve common problems related to scheduling such as: double booking or over booking. However, using shared assets involves more than just simply observation and reservation; it is enmeshed in daily activities of users; which constitutes a fluctuation in demand of a particular service or asset. For example, there would be an enormous demand on hotel rooms and airline tickets in holiday seasons; shared vehicles only shows their effectiveness before or after working hours. Therefore, the facilities are not used at their highest capacities while the waiting lists are lengthened during peak hours. To solve this problem, we propose an approach which gamifies traditional reservation systems.

Gamification, application of game elements and game principles into non-game contexts to support user engagement [2], has been proved to improve service use such as increasing social interaction or quality and productivity of the actions [6]. In this paper, we aim at understanding how gamification might enhance user experience and change their behaviors in using shared assets. For evaluation, we present the design and deployment of Playful Laundry which is a gamified version of the laundry booking system. Findings from interviewing the students who are currently using a shared laundry room in dormitory offer evidence that our application has been attracting much interest of the user and promising to adjust their laundry habits.

RELATED WORK
The idea of a system that affords reservation, observation and notification is not new. It has been widely used in transportation, hotel or even entertainment industries for years. Nowadays, every online reservation systems allow users to reserve services in advance, manage bookings and remind them whenever the time coming.

There are also some works putting effort on flow optimization such as introducing the concept of "Reward Pool" which provides its users with incentives to improve its utilization [9]. For example, today most travel reservation systems award money to the users as an incentive for reserving unpopular time slots. In [4], the authors proposed using priority criteria and access threshold in order to remove waiting list of surgical and medical procedures. Edara *et al.* presented Highway Space Inventory Control System which is a booking system for highway trip that determine whether to accept or reject a reservation based on a pre-defined demand in order to optimize the highway allocations for different traffic scenarios [3].

All these solutions are only adaptable for a particular situation and could not be reused at all. In this project, we extend the idea of reservation toward gamification in order to not only improve user experience but also address the optimization problem.

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LAUNDRY PRACTICES

Laundry practices are not just washing and drying clothes; they are effected by the ordering of our daily routines [7] and other occasional factors external to laundry itself such as running out of clothes. In order to understand laundry habits and typical use scenarios of shared washing machine, we conducted user surveys and a pilot workshop involving students in the dormitory to collect information about their experiences of using shared laundry room and thinking toward an ideal management system.

It is not very surprising that the students have issues when using the communal laundry room which has a limited number of washing machines. Firstly, to do the laundry, students usually periodically go to the laundry room to check for available machines. During weekend, it could take them hours waiting for their turns. Secondly, the wash times are variable and unpredictable; machines automatically adjust their wash cycle duration according to factors such as: clothes weight, water temperature or pressure, etc. Therefore, students also have to check for the finished jobs. Sometimes, forgetting to pick up the clothes could get them left out by other student. However, these situations only happen commonly during peak hours when the vast majority of students come and do their laundry at the same time whereas the washing machines are being left unused at other times; resulting in an inefficient usage of the machines.

With those aforementioned issues of an example of "the tragedy of the commons" at the dormitory, the participants in the workshop also come up with some requirements for a management system. Particularly, they are looking forward to a system that allows them to reserve laundry time-slot in advance and remind them for upcoming booking or finished job. Some students do not always remember to book a time-slot, they want the system to allow them to reserve the machine at the laundry room or provide information about available machine right away without having to go to the laundry room.

Based on the collected information and envisioning, we design and prototype Playful Laundry, a laundry booking system which affords:

- Reserving and managing time-slot on mobile phone or at the laundry room.
- Notifying the users for upcoming bookings, finished jobs.
- Real-time status observation of the machines.
- Display of statistics about usage history of the machines.

GAMIFICATION AND GAME ELEMENTS

OUR APPROACH

THE GAME RULES

PROTOTYPE

EVALUATION

Evaluation

CONCLUSION AND FUTURE WORK

Conclusion

REFERENCES

1. Matthew Barth and Susan Shaheen. 2002. Shared-use vehicle systems: Framework for classifying carsharing, station cars, and combined approaches. *Transportation Research Record: Journal of the Transportation Research Board* 1791 (2002), 105–112.
2. Sebastian Deterding, Miguel Sicart, Lennart Nacke, Kenton O'Hara, and Dan Dixon. 2011. Gamification. using game-design elements in non-gaming contexts. In *CHI'11 Extended Abstracts on Human Factors in Computing Systems*. ACM, 2425–2428.
3. Praveen Edara and Dušan Teodorović. 2008. Model of an advance-booking system for highway trips. *Transportation Research Part C: Emerging Technologies* 16, 1 (2008), 36–53.
4. Robin Gauld and Sarah Derrett. 2000. Solving the surgical waiting list problem? New Zealand's 'booking system'. *The International journal of health planning and management* 15, 4 (2000), 259–272.
5. NextBike Gmbh. 2015. NextBike. (2015). http://www.nextbike.net/
6. Juho Hamari, Jonna Koivisto, and Harri Sarsa. 2014. Does gamification work?–a literature review of empirical studies on gamification. In *System Sciences (HICSS), 2014 47th Hawaii International Conference on*. IEEE, 3025–3034.
7. Elizabeth Shove and others. 2010. Beyond the ABC: climate change policy and theories of social change. *Environment and planning. A* 42, 6 (2010), 1273.
8. Wikipedia. 2015. Computer Reservations System. (2015). https://en.wikipedia.org/wiki/Computer_reservations_system
9. Henri MA Winand and Paul J Harris. 2006. Methods and systems for optimizing flow. (June 29 2006). US Patent App. 12/306,840.