Common Pool Resource: To Optimize Laundry Machines at AvB

Group: Bee Happy

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1. Introduction to the problem:

The washing machines and driers at AVB are meant to be available to all students part of the LUC community. However, the good-functioning, as well as the availability of this resource are often limited:

1. The price for washing is quite elevated (2,50€) which limits the access for students on a budget.

2. The availability of the washing seems to be constantly limited (only 5 washing machines and 4 dryers for a total of 400 residents in the building):
   a. A wash takes approximately 40 minutes - the laundry room is open 24 hours/ days
   b. number of washes per machine/ day: 1440 / 40 = 36 washes
   c. total number of washes for the 5 machines/ week = 1260 washes:
      i. 1260 washes > 400 students - Therefore, if the use of the machines is optimalized, the students should be able to do their laundries at least once a week.
      ii. Problem: there are peak hours at which students come to do their laundry (weekends and evenings) - see problem 3.
      iii. Furthermore, time-slots from 1am to 7am are unlikely to be used.

3. The time-slots at which students are more likely to do their washing often coincides with their spare time. Incidentally the machines are almost always full in the evenings and on weekends.

4. Technical problems are non-rare with the machines:
   a. Problems include:
      i. Doors getting blocked,
      ii. Control board being jammed,
      iii. People reserve machines but do not come to drop off their clothes.

5. Student adopt a non-respectuous/ selfish behaviour toward other user:
   a. if the washing machines are used, many students leave their laundry in there for longer than necessary (not picking up when washing machine is done), which means that students who want to wash their clothes take out the loads from the previous user and leave it on the floor. This is problematic because the laundry gets dirty again and has to be washed again.
a. **Why is it a CPR:**

This resource is **non-excludable** since all the students who live in the Anna van Buerenplein Campus (that is the first and second years), should, once they manage to get hold of a laundry card, be able to access the washing machines.¹

The washing machines are also **rival goods**, since the utilisation of a washing machine by a student, excludes other students from using this resource.

b. **Winners & Losers:**

**Winners:** DUWO or the people taking washed laundry of others out

**Losers:** Residents of AVB or the people whose laundry gets dumped on the floor. Dutch students who have to do their laundry at home, as a consequence of the facilities at AvB being inefficient.

c. **What is the problem?**

i. motives behind failure:

   DUWO & Vastgoedservice (as institutions) are unwilling to make the materials more available by not reducing the price or efficiently repairing the recurring technical problems with the machines.

ii. Possible solutions:

   1. Creating an efficient schedule system which would avoid cramming and allow people to know when to plan their washing for.
   2. Asking for a reduction in the price of the machines from DUWO. This would allow students to be able to afford more regular wash, it would reduce the loads they put in (which is better for the maintenance of the machines) and increase their flexibility.

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¹ *It could be considered as a club/toll-good, in the sense, that in order to have access to the resource, one must be part of LUC, and therefore, have paid their student fees and their mensual appartement rent.*
2. Quantifying and Qualifying the initial challenge:

a. Facebook complaints:

In order to come up with a plan of approach, we need to observe what the problem is. To initially quantify the problem, we have chosen to analyze the AvB Housing Council Facebook page, where residents are able to post complaints about the residency including the laundry room. We have taken a sample covering a calendar year, from 28 September, 2014 up until 24 September, 2015. We have found 82 complaints during the sample period. There exist more; however we have not counted duplicate complaints, for instance, multiple complaints about one machine giving an error within the same day. There have been no complaints during the eleven-week LUC summer break. That means that with 82 complaints over 41 weeks, there has been an average of two complaints per week. This analysis also provided us with data we could categorize into seven categories explained below.2

- **MACHINE DONE**: requesting current users to pick up their (finished) laundry, so that machines become available
- **RESERVED NOT USED**: requesting users to either use or cancel their reservation, so those machines are being used as intended or become available
- **RELOCATED LAUNDRY**: either notifying previous users about their laundry being removed from the machine to create availability, or complaints about unwanted relocation
- **MACHINE ERROR**: complaints about washing machine malfunctioning
- **SCREEN ERROR**: complaints about operating screen malfunctioning
- **WEBSITE PROBLEM**: requesting help with the laundry website
- **OTHER**: any other complaints which would not fit in any of the previous six categories3

Some posts requesting users to empty their machines specified the time that the laundry had been in there after the machine finished washing. These specifications varied from 0.5

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2 Examples of Facebook posts can be found in appendix D4.
3 The data is represented in a spreadsheet, which can be found in appendix D8.
to 2.5 hours. In one case the laundry had not been collected within 8 hours after finishing. It should be noted that in all of these posts, at least two machines were mentioned. Concerning the reservations, there have been complaints about all five machines being reserved but not used at the same time. In the case of laundry relocation, most of the time the laundry would be relocated to either a dryer or a bag, however we have recorded two cases in which the laundry was placed on the floor. Machine and operating screen errors regard software failures, such as locking the door or taking a payment without starting the washing process. The category “other” displays two cases about soap, a possible allergy and soap stains on clothes after washing. The soap stain issue has been investigated previously and the conclusion was that soap stains occur when people add their own detergent, even though it is not allowed. Especially the few people after the initial wash will have to deal with soap stains. There have also been a few complaints about laundry cards not working, especially after not changing the pin code within the allotted timeframe. Since one can simply buy a new laundry card for 5 euros at the DUWO office, we do not deem this to be a problem.

Additionally, we have been able to quantify the complaints about malfunctioning machines. There have been a total of ten complaints about machine 2, five complaints about machine 3, and also five complaints about machine 5. There have been no complaints about machines 1 and 4. It seems that machine 2 faces problems about twice as often as machine 3 and 5.

It is also important to mention that there have been no complaints about dryers whatsoever; therefore we have chosen not to include them in our intervention.

b. **Website monitoring:**

We have been monitoring the laundry website as well, where one can check the status of every machine in real-time. We have used screen capturing software to occasionally monitor the machines. We have found that it was very common that people would not collect their laundry within 15 minutes after finishing.

c. **Possible interventions:**

According to the data there are three main problems:

1. People not collecting their laundry in a timely fashion,
2. Reserving machines and then not using them,
Therefore our first goal was to tackle the first problem and lower waiting times for access to the washing machines. We decided to design posters with tips for efficient usage, such as setting a timer so that people remember to collect their load on time. We have also included all the information one might need in case of software and/or hardware failure, for instance a roadmap for fixing problems on the spot, and numbers to call in case of severe errors.

Then, we decided to make an instructional video about the laundry, which teaches the viewer everything about the website in less than 4 minutes. Furthermore, we bought five large laundry baskets, so people can empty machines of other people's laundry and start their own washing immediately. We decided to label the machines 1 to 5, respective to the machines, and provided them with Leiden University logos so that, together with the fact that they are substantially large, we will be able to prevent them being stolen.

We will discuss failed intervention ideas in detail in the dedicated section.
3. Baseline:

In order to fully understand the extent to which the washing machines are being misused at the Anna van Buerenplein, we collected a baseline of data which has allowed us to mark any progress. Multiple techniques were used for this:

1. Obtaining data already collected by DUWO through the website which operates the washing machines,
2. Surveys sent to the inhabitants asking them of their average usage of washing machines and dryers on a period of one week, whether they have had issues with the service in general and whether they considered the need of improvements important or not.

a. First set of DUWO data:

In order to deal with the appropriation issue of a lack of laundry machines, we decided to analyze the usage of the washing machines themselves. For a second set of baseline data, we contacted DUWO and asked if they would be willing to share information regarding frequency of the use of the laundry machines. At first they were reluctant as they were worried about confidentiality, however they agreed to provide us with the data containing anonymous results. These results include three types of graphs depicting the usage of the laundry machines. We were provided with a 7 day-by-day overview as well as the average usage per hour of a week, and the weekly proportion overview. This data was collected from Monday 14 September to Sunday 20 September.

The first graph⁴ provides an overview of the most frequent use by hour (average of one week). The daily average shows the average of all days of the week, displaying the most frequent hours. The graph shows that most people do their laundry between 11:00 and 23:00. This specific data was not very helpful, as it didn't display anything out of the ordinary. We couldn't say much about the specific 'peak' frequency based on this graph alone.

The weekly load⁵ shows the percentages of washes done on each day of the week. It can be seen that on Wednesdays and weekends the machines are slightly more frequently used (likely because people are off Wednesday afternoons and during the weekends). Again, nothing out of the ordinary, however this time the information was slightly more useful as it told us on which days the machines were occupied the most. The data did not show the proportions of the days in comparison to one another, but instead the amount of time the machines were running compared to the number of machines for each day. This allowed

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⁴ See Graph 1 in appendix
⁵ See Graph 2 in appendix
us to inform the residents of the busiest days (Wednesday 32%, Saturday 30%, Sunday 26%).

The day-by-day graphs\(^6\) were, alongside the daily proportions, the most useful indicators of when the machines were really being used, as they displayed specific times and peak hours. This showed the average usage of each day of the week, per month.

Contacting them for the first time was essentially to help raise awareness regarding the peak hours, so that we could convince residents of AvB to use the facility during less busy times. That way the usage could be more spread out, allowing more people to do their laundry without having to wait (dealing with the appropriation problem). Contacting DUWO for the second time was to gather a second set of data regarding the usage of the machines, so that we could analyze whether or not our tactics to raise awareness were effective or not.

We analyzed this data to try convincing those who use the laundry facilities to do their wash during the 'off peak' days and hours. The most frequent days included Wednesday, Saturday, and Sunday. We included this, as well as specific peak hours (11:00-17:00 on Tuesday & Wednesday, Thursday 22:00-00:00, Friday 14:00-18:00, Saturday 11:00-20:00, Sunday 14:00-18:00) on our posters to try incentivize people to do their laundry at different times, so that they would not have to wait too long.

b. **Initial survey:**

As a way of collecting baseline data, we posted a survey on the AvB housing page on Facebook, on the 22-9-2015, asking people about their experiences with the laundry machines. The results of this survey will be discussed in the next section, per question. For the overview of the results and all the raw data, please refer to the appendix.\(^7\)

**Survey 1 question analysis:**

**In which year of LUC are you?**

Some third years who do not live at AvB have filled in the survey, this means they filled it in from memory, which might skew the results, since bad memories last longer than “regular” ones.

\(^6\) See Graphs 3-9 in appendix  
\(^7\) See section A
Do you ever use the laundry website to see which machines are in use?

A large proportion (77.3%) of participants say they have used the website. This means that its existence is widely known and we might do something to make this website even more functional for all, and also include the 13.6% who do not know about the website. Using the website will help people to go and wash on moments that the machines are available, making the appropriation problem less of an issue for people.

Have you ever encountered problems using the laundry machines on floor 0?

This question is an indication of people’s general feel on the washing room and how they use it. Broken or not working machines create a provision problem. In this question, 66.7% of participants admits that they have in fact encountered problems whilst using the washing machines. Only 20% has not encountered problems, but has used the machines and 13.3% says that they have never used the machines, which means that the proportion of people who do use the machines and have problems is 76%. For later analysis of the results, after the interventions, the people who do not use the machines will be taken out.

Do you ever use the function that sends you a text when your laundry is done on the laundry website?

Nobody answered “yes” on this question, upon further research, we have found that this option is only available in Denmark, so people cannot use this function. This is also probably why almost half of the participants is not aware of this possibility.

Do you ever put your basket in front of the laundry machine whilst your laundry is in there?

The results of this survey are fairly different from the results of the Facebook baseline data. 1/3 of the participants say that they do put their basket in front of the machines, however, this will not be all the time, since there are frequent complaints on Facebook about people taking too long to pick up their laundry. Also, for the 26% who does not put their basket in front of the machine, a solution must be found, since it limits the possibility for everyone to use the machines, making the appropriation problem bigger.

Have you ever thrown other people’s laundry on the floor?

The results of the survey again do not reflect the things found on Facebook. This could be because the participants didn’t answer this question truthfully or because the people who throw people’s laundry on the floor are also not too eager to fill in surveys.
Have you ever called Vastgoed if one of the machines was broken?

Here there was a mistake in the survey, making the option “yes” unavailable, however, participants were asked if they did call Vastgoed, to indicate so in the final question. No-one did this, so we can assume none of the participants has contacted Vastgoed. Almost half of the participants have encountered a broken machine, and, if we take out the 13% who has said they never used the machines, these numbers should be even higher. So here, we see a big part of the problem, people encounter a lot of broken machines and do not know what to do to fix it the quickest. This means that there is a provision problem, namely, machines break a lot, and there is a way to solve it but people do not know how to. This enlarges the appropriation problem, because if less machines are working, less machines can be used.

Have you ever fixed an error on the control screen of the laundry machines yourself?

Half of the people did know that this was an option, but have never done this. This probably means that they have never encountered an error on the control screen. 14% did not know this was possible, here we can help by telling them how to fix the problem, making the washing machines available more often, making the appropriation problem smaller. 35% of the participants did already know what to do.

Have you ever intentionally avoided laundry room peak hours?

More than ¾ of the people say that they have avoided peak hours, which is great, but since in the DUWO data peak hours are still visible, it must be that a lot of these people do not always avoid peak hours. To lessen the appropriation problem, people should try and spread out when they do laundry. We should try to facilitate that.

Do you have any ideas on how we could make doing laundry easier and more pleasant for everyone?

This question was used to inspire possible interventions. Answers to this question include a lot of making the machines bigger or more machines, but fixing that is out of our reach. Also one person suggested making putting your laundry bin in front of the machine compulsory for everyone, this could solve problems. A reduction in price is mentioned, but this doesn’t solve the CPR, it will only make it bigger, since then more and more people will use the machines. Incentivising people to do their laundry at home is mentioned, this would help with solving the CPR.
4. Interventions

Several interventions were put in place in order to reduce the waiting time for access to a washing machine. The main intervention carried out was to raise the awareness of the residence through multiple platforms, to the most convenient times to do their laundry. And Furthermore to help the residence solve problems with the machines themselves.

A second intervention was to implement laundry baskets in order to reduce the waiting time for access to a washing machine.

a. Raising awareness:

Posters and Facebook posts were one of the most important tools in raising awareness in order get people to do their laundry at different times and days. There were two different types of posters that were placed in the laundry room, both with a different goal in place. One poster was made in order to raise awareness as to when would be the most efficient times and days to avoid doing laundry and some basic tips that could reduce waiting time for other people, while the other poster was to inform people on what to do when laundry machines were not functioning properly.

i. Posters:

Two different posters\(^8\) were created with the same information on what days and times people should try to avoid going down to do their laundry in order to reduce waiting time in terms of people’s laundry still being washed or are done but still in the laundry machines. Thus, on these posters, we provided information concerning the rush hours, which were usually between 11 am and 3 pm, and to try to avoid Wednesdays and weekends as those tend to be the busiest. The reason for these days to be so busy was that most people had a free day on Wednesday and it was the perfect opportunity to do their errands, for this reason, weekends also tended to be busy. Furthermore, the posters contained tips on helping to reduce the waiting time for other people by taking own initiatives by setting an alarm on when their laundry should be done so that they remembered to go down to get it. In addition, putting a bag in front of their laundry machine so people are able to put their laundry in the bags when their laundry is done so the laundry machines can be free and used. Hence, two different types were created in the hopes of catching more student’s attention, whereby they may walk past one of the posters, however, stop to read the other one.

\(^8\) see appendix C.1 and C.2
While the other posters\(^9\) were used in order to inform people on what they should do when difficulties and complaints were faced about the washing machines or the control screen. It was noticed that people had several problems with the laundry machines and the screen, they also did not know what to do and who to contact, so we took it upon ourselves to inform people on what to do in certain situations and how to deal with it. Hence, this also reduces the waiting time and uncertainty amongst people as they will be able to take action themselves and fix a problem which arises. Hence, these posters were put next to the laundry screen as people always have to go there first to start up their washing machines and are therefore likely to see and read the poster that is next to it, in addition to most problems that were faced tend to deal with the laundry screen itself.

These posters are a form of interventions as they inform people about the current situation and provide the solutions on how to fix them. Especially by providing them with the peak usage hours so that they may avoid them and hence increasing the overall efficiency of the machines. Furthermore, the poster on tips on what to do when laundry machines and the screen is broken is another intervention as it provides people with the information and advice on what to do when problems are faced with them, and fixing it themselves or knowing who to call instead of having to ask and wait around for other people to help.

\textit{\textbf{\textit{ii. Facebook posts:}}} \\

Facebook was used to post the same information that was posted in the laundry room.\(^10\) We used this as a method of intervention as it is able to reach a larger number of the community as most people that live in this building are part of the LUC Facebook groups. And even people that do not use the laundry facilities, are able to inform and tell their friends about the posts. Furthermore, the community is also able to ask questions or give advice about the laundry machines if any questions or concerns arise, which they are not able to do with posters, in addition to see people’s reaction and responses to us dealing with this issue and whether it is an actual problem.

\textit{\textbf{\textit{\textbf{iii. Video:}}}} \\

An instructional video was created which guides the viewer through all the facilities of the laundry website. We found this to be important, since there are still people who did not know how to check for machine availability online, or how to charge their laundry cards. The guide also includes information on how to contact the laundry service supervisors through a ticket, may that be necessary. We hope to provide enough information to the website users to boost efficient use of the machines, for instance by discouraging using the reservation system without starting a washing cycle timely. We believe that the main

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\(^9\) see appendix C.3 and C.4
\(^10\) see appendix D
effect of the video will be to increase awareness of the website and the possible features which may increase efficiency of the laundry room.

b. **Facilitating laundry:**

   i. **Laundry baskets:**

   The second main intervention which was implemented, was to buy baskets and place them in the laundry room.\(^{11}\) The reasons for this is that we found out that not everyone places a laundry bag or basket in front of the laundry machine that they are using. The reason that this should be done is so that people are able to take out the laundry from the previous person if it is done, and place it in the provided bag so that the next person is able to do their laundry without having to wait for someone to come down to get it. Therefore, we decided to take the initiative to buy five baskets that everyone is able to use and place them in the laundry rooms. This way, the people that forget to put a bag in front of their machine can use them, or if the next person wanting to do the laundry and realized the laundry is done can take a basket and put their clothes in it. However, when these baskets are used, they need to make sure that they use the corresponding basket with the corresponding machine so the clothes don’t get mixed up and people know where their clothes have gone. Hence, we believe that this would be an efficient intervention as people would not have to worry about where to put other people’s clothes if no bags or baskets are provided, in addition to having to wait for people to come get their clothes from the already finished laundry.

   However, some drawbacks could be faced with this intervention, as people could steal the baskets and take them to their room and keep them there. We have warned people on Facebook that consequences will be faced if this is done, and that is is LUC property – whereby we are assuming that people would have the basic respect not steal them. In addition to this, we made sure that we bought baskets that are big so that they are inconvenient to keep in their room due to their size.

   Resuming, we used several interventions which included posters, videos and Facebook posts to inform people about the situation and how they can help to reduce the waiting time in the laundry rooms. In addition to being able to solve the problems of broken machines or laundry screens themselves instead of relying on other people. And lastly, implementing laundry baskets for people that forget to place bags themselves. Most of these interventions are short term solutions or face difficulties to change. This is because it is likely that people will continue to do their laundry on the same day that they usually do it instead of changing the day and times, as they do their laundry when it is most convenient for them and when they have time. Thus, people are less likely to change their old habits. Several other interventions could also have been taken place, however, due to

\(^{11}\) see appendix C.6 and C.7
the time constraint and resources, they could not have been carried out and are in the section *future interventions*. 
5. Barriers & Failed interventions

a. Barriers to intervention:

The objective of the group project was to maximize and optimize the results of our interventions within a limited framework of time and restrained monetary funds. Indeed, we have encountered multiple barriers that have restrained our capacities to intervene. We consider three factors as main barriers: time, money and logic of collective action problem.

The time-slot designated to discuss a Common Pool resource issue and to take action was of 8 weeks (of which one was used to find the topic and one was used to work on the final report). This limited our actions because the pressure to take action was important but also it did not leave a time-slot to realize if a change really had been made by our interventions.

Another issue, which limited the group’s capacity of intervention were budgetary restrictions. Indeed, the actions were based purely on facilitating the process rather than alternating it. With monetary funds, we would have had a complete new area of intervention, that is we could have added one or two laundry machines.

In some cases, the group was faced with a collective action problem. In other words, a situation in which each individual (of a group) has the choice between two alternatives, and where, “if everyone involved acts rationally (in the economic sense), the outcome will be worse for everyone involved, in their own estimation, than it would be if they were all to choose the other alternative (i.e. than it would be if they were all to act "irrationally" (in the economic sense)” 12 In other words, as Mancur Olson, writes “Most groups cannot provide themselves with optimal amounts of a collective good.”13 Indeed, we noticed that, in logic of some students it was preferable to adopt a rather selfish behaviour and not willing to adopt the group logic.

b. Failed interventions:

One option considered in order to overcome the over-use of the laundry machines was to externalize the problem. In other words, convince residents of AvB to use services and facilities outside of the building to do their laundry. It would reduce the congestion for the washes and the waiting time, which would enable to optimize their use. Therefore, we went on a conquest to find self-service laundry-room in the surroundings of the residence. After an intense Internet search, we found that there were, within an area of 2 kilometers (because it can be cycled in less than 10 min) 4 laundry services. The distance and the

12 http://spot.colorado.edu/~mcguire/collact.html
13 Mancur Olson, The logic of Collective Action
accessibility of these services was not a problem. (Some of the businesses even offered to pick up and drop your laundry when your consumption was over 20 euros). However, the price is a major issue. For instance, “Stomerij Panda Den Haag” charges 8 euros for a wash of 12 kilos, which is triple the price of the washes at Avb.

We have tried to come to an agreement to reduce the prices for students, but all of the laundries services refused either because their system was a self-service already established with coins or because they argued that students were not profitable consumers on the long-term (because we only live here for a couple of years and do the washing for one person only).

Therefore, we can argue that we have failed this intervention because we did not manage to externalize and find a viable option for students to do their laundries outside of the residence.

Another option we have considered in optimising the use of laundry machines was to improve the App of the responsible enterprise. The current problem with this App was that it did not work for some old versions of phones and that some of the services of the App were non-operant. Namely, the App is supposed to send an instant message to the person who put their laundry in the machines when the wash is done. However, this function, amongst others, is non-operant.

We contacted the Danish agency responsible to, if not convince them, make them aware of this problem. As a response, we received, that they were aware of this issue but that the reason it was non-operant was because the services and the availability was limited to Denmark and that it would cost them important surpluses to make the program available in The Netherlands. The company argued that there were similar Apps, not linked directly with the laundry machines in the residence, but for which the washes took the same time, and that we could use this App in order to be reminded of when are washes are done.

We can say that this was a failed intervention because we did not manage to have the outcomes (improvement of the App) we had expected. Instead, we made posters to ask people to set timers (we indicated the length of a wash) on their phones to be reminded of their laundry and come and pick up their washes as soon as they are done, which reduces the time of waiting for others.
6. Possible future interventions

a. Website & App:

As a possible future intervention that would link into what we have already implemented, it would be beneficial to slightly redesign the website thereby making it easier to use. It also appears that the sms service is not available outside of Denmark. By contacting the main company in charge, we would hope that in the future this option would be available. The app would possibly be simpler to use and would enable to alarm setting which sends the user a text at the time when their machine finishes. This would further address the problem of appropriation by helping users be more efficient in their use of the washing machines.

b. Soap:

Another issue that is clearly causing discontent about the washing machines is the soap. The machines are provided with their own washing soap meaning that adding your own soap is not necessary. However, some users—either because they are unaware of this or do not care—still add their own soap into the machines. The result of this is that whichever person washes their clothes after a user who put in their own soap will find residue of it on their clothes due to the overaccumulation of soap in the machines.14

To solve this problem we would need to raise awareness about the already existing soap in the machines so as to make sure people do not add their own. The problem, however, is slightly more complex when looking at other types of complaints that have been made about the soap. Some users have complained that the soap present in the washing machines causes them to have allergic reactions.15 This is highly problematic because users need to have non-excludable access to the washing machines. If, however, they are allergic to the soap they will be unable to exercise that right. A possible future solution that may solve both of these problems (stains and allergies) would be to ask Vastgoed and DUWO to remove the soap in the machines altogether. In doing so, it would make the maintenance of the machines by DUWO easier as they would not need to invest in refilling the soap. Those users who have had allergic reactions could use their own soap which they know does not affect them. Lastly, there would not be overfill of soap as each user would individually add only what is necessary to their wash.

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14 see appendix D3.
15 see appendix D3.
c. **RAs and AvB Housing Council:**

One of the main issues we have been trying to solve is for the washing machines to be more accessible to users at all times. One of the main recurring problems is the master screen coming up with “Error 059”. Our interventions allowed us to raise awareness on who to call and some simple tricks that can work to fix the problem. However, these tactics are not long term interventions and do not necessarily work every time. A more efficient method would be for the AVB Housing Council or RAs to be informed by Vastgoed on how to address these problems when they occur. A first step to this could be to organize a meeting between these actors in order for the information to be transmitted. In the long-term we would hope that Vastgoed and DUWO, thanks to maintained contact would be willing to give the responsible parties at AVB a way to solve this. This would be more efficient for several reasons. Firstly, RAs and AVB Housing Council always have at least one person present in the building making their response time to any issue far more reliable. Vastgoed are responsible for fixing the machines but cannot be reached after 5pm or on weekends. After discussing these issues with DUWO they have agreed to look into the possibility of duplicating the key which fixes the screen errors and delegating it to the Housing Council. We believe this future intervention will highly increase the efficiency of solving a regularly occurring problem which in turn addresses our CPR problem by increasing the availability of the machines’ use without problems.

d. **Reservation system:**

We have found that the reservation system on the website does not work to the best of its advantage. Namely, people can reserve a machine online for a certain time slot and only pay once they come down. What this creates is a stagnation in the time between when users reserve and the time at which they actually come down to use the machine. Most people come late, which occupies the machines thereby making it impossible for any other person to use. We have slightly addressed this issue through our raising awareness interventions. The instructional video showed users that it is possible to see whether or not machines are available. Checking this before going down with your laundry ensures that you know there is a machine available for use. Also, we encouraged people to set alarms. This is true for the people who have made a reservation and for those coming to pick up their laundry on time.

One more way in which this issue might be addressed is by making online reservations pay upfront or shorten the reservation time frame. Having spoken to DUWO, they have agreed that this system needs improving and will get in contact with the company in charge to see if either of these possibilities can be implemented. The way either of these options would help solve this problem is by increasing users’ incentives to take their laundry down to the reserved machines in a timely manner. By paying upfront, they do not
want to lose their spot as they have already paid. If the time frame is shortened from one hour to 15 minutes for instance, it will insure that the machines reserved are used and left quickly available without is being a problem for other users.
7. Compare Progress: Quantifying and Qualifying the progress

In order to observe a significant change in the CPR positive or negative, we proceeded with collecting data from laundry machine data information provided to us by DUWO and sent out a second survey to the residents of the Anna van Buerenplein.

a. Second set of DUWO data:

When looking over the graphs retrieved from DUWO for the second collection of data, distinct changes can be noticed. Firstly, it appears that people have listened to our advice concerning the peak hours. All of the main days that we mentioned as the busiest; Wednesday (32%), Saturday (30%), and Sunday (26%) all decreased in usage. The data showed a 12%, 18%, and 2% decrease on these days, respectively. It is our belief that making sure people were aware of the peak hours had a significant effect on when they would make use of the facility. Furthermore, many of the graphs displaying the daily usage have a more spread, uniform distribution than previously. This suggests that people are not only taking into account the busiest days, but the peak hours on specific days.

Although one might argue that telling people to abandon wednesdays and the weekends to do their laundry will cause the machines to be used excessively on other days, we are assuming that only a proportion of people will adhere to this advice. Many will still keep their habits of doing laundry on their preferred day or at their preferred time, regardless of business.

We believe that the generally frequent use of the machines is also the reason for the machines breaking down on a regular basis. Perhaps running the machine continuously for hours on end has an effect on the likelihood of it breaking down.

b. Second Survey:

To see if our interventions have indeed worked out, we have taken a second survey, sent out on 8-10-2015, on the same Facebook page. We have asked the same questions as in the initial survey, as well as three additional questions aimed specifically on the interventions we did and whether people found these useful or not. Chi-square tests were performed on the questions which were asked twice, to see if there was a statistically significant difference between the two results. However, the number of observations of both the surveys were small, 45 and 69 respectively, this is because the population we aim at, people who live at AvB and use the laundry machines, is not very big, since a lot of students do their laundry at home and would not have felt the need to fill in the questionnaire. This means that the statistical significance of the results, especially in a chi-square test will be very unlikely, but no statistical significance does not necessarily
mean that there is no significance at all. The results of this survey will be discussed in the next section, per question. The statistical significance is tested at the 95% confidence interval. For the overview of the results, the Rscript used and all the raw data, please refer to the appendix, section A.

Survey 2 question analysis:

**Have you ever encountered problems using the laundry machines on floor 0?**

This question was used to remove the results of the people who never use the laundry machines. All observations of people who have not ever used the laundry machines were removed, making the results more clear and aimed at our intended population. This leaves 39 participants for survey 1 and 61 participants for survey 2. We did run a two-tailed chi-square test to see if the proportion of people who ran into problems is significantly different between the two surveys. A p-value of 0.5 indicates that this is not the case.

**Do you ever use the laundry website to see which machines are in use?**

In the first survey, 4 (10,3%) participants indicated that they were not aware of the possibility to use the laundry website, 1(2,6%) participant indicated that he didn’t use it and 34(87,2%) indicated that they did use the laundry website. In the second survey, 9 (14,8%) participants indicated that they were not aware of the possibility to use the laundry website, 14 (23,0%) participants indicated that they didn’t use it and 38 (62,3%) indicated that they did use the laundry website. We ran 2 one-tailed chi-square tests based on these results, one investigating the change in awareness, so if the proportion of the people who were not aware of the possibility to use the website got smaller, and one investigating the actual usage, so if the number of people who used the website got smaller.

For the awareness test, it is already clear that in the second survey the proportion of people who did not know about the website has increased, instead of decreased. However, when we run the chi-square test, we get a p-value of 0,6, indicating that this result is not statistically significantly different, which means that on a statistical level, no change occurred.

For the usage test is also already clear from the proportions that there are more people who do not use the website than people who do in the second survey. However, when we run the chi-square test, we get a p-value of 0.006, indicating that this result is statistically significantly different, which means that after our interventions, less people used the website. This could be because they go outside of peak hours so they do not feel the need to check the website, or just because of a sampling coincidence. There must be a confounding variable, however, since it cannot be that our explanation of the website lead
to less use of it. The implications of this question will further be discussed in the questions aimed at our interventions.

**Do you ever put your basket in front of the laundry machine whilst your laundry is in there?**

In the first survey, 2 (5,1%) participants indicated that they were not aware of the possibility to put your basket in front of the machine, 8 (20,5%) participant indicated that they did not put their basket in front of the machine and 29(74,4%) indicated that they did put their basket in front of the machine. In the second survey, 3 (4,9%) participants indicated that they were not aware of the possibility to put your basket in front of the machine, 11 (18,0%) participant indicated that they did not put their basket in front of the machine and 46 (75,4%) indicated that they did put their basket in front of the machine.

We ran 2 one-tailed chi-square tests based on these results, one investigating the change in awareness, so if the proportion of the people who were not aware of the possibility to put their basket in front of the machines got smaller, and one investigating the actual usage, so if the number of people who put their basket in front of the machine got smaller. For the awareness test, it is clear from the results that the proportion of people who did not know that they could put their basket in front of the machine shrunk, but when we run the test, we get a p-value of 0.9, which means that the results are not statistically significantly different. For the usage test, it is clear from the results that the proportion of people who did put their basket in front of the machine grew, but when we run the test, we get a p-value of 0.5, which means that the results are not statistically significantly different. This means that on a statistical level, nothing has changed, however, there does seem to be a slight increase of basket usage. The implications of this question will further be discussed in the questions aimed at our interventions.

**Have you ever thrown people’s laundry on the floor?**

In both the first and the second survey, 2 people indicated that they have ever thrown people’s laundry on the floor, but for the first survey this is 5,1% and for the second survey this is 3.3%. This means that we do see a decrease. We ran one one-tailed chi-square test to see if this difference is statistically significant. We get a p-value of 0.5, which means that this difference is not statistically significant. This means that on a statistical level, nothing has changed, however, there does seem to be a decrease in the proportion of people who throw people’s laundry on the floor, which might be due to our baskets.
Have you ever called Vastgoed if one of the machines was broken?

In the first survey, 20 (51.3%) participants indicate that they have never encountered a broken machine, this means that 19 (48.7%) participants have encountered a broken machine and no-one has indicated that they have taken the right action and have called Vastgoed if they had encountered a broken machine. In the second survey, 37 (60.7%) participants indicate that they have never encountered a broken machine, this means 24 (39.3%) of the participants have encountered a broken machine and 3 (4.9% of total) people indicate that they have called Vastgoed if they had encountered a broken machine. This means that we see an increase in the number of people who knew what to do. We ran one two-tailed chi-square test to see if the number of people who have encountered a broken machine increased, and one one-tailed chi-square test to see if the number of people who have actually done the right thing and called Vastgoed has increased in a statistically significant manner.

In the two-tailed chi-square test we get a p-value of 0.5, which means that the change in the number of encounters with broken machines is not statistically significant. In the one-tailed chi-square test we get a p-value of 0.07, which means that the change is very close to statistical significance, but it is not statistically significant. This does mean that we can say on a 93% confidence interval that there is a significant increase in the number of people who have successfully handled a broken machine situation.

Have you ever fixed an error on the control screen of the laundry machines yourself?

In the first survey, 5 (12.8%) people indicated that they were not aware of the possibility to fix errors on the control screen themselves, 19 (48.7%) participants indicated that they had never done that and 15 (38.5%) indicated that they did. In the second survey, 4 (6.7%) people indicated that they were not aware of the possibility to fix errors on the control screen themselves, 35 (57.4%) participants indicated that they had never done that and 22 (36.1%) indicated that they did. We ran two one-tailed chi-square tests, one to investigate if the change in awareness is statistically significant and one to check if the change in the number who have ever fixed an error is statistically significant. When we run the awareness test, we get a p-value of 0.2 which means that this change is not statistically significant. When we run the test to see if the decrease in people who have fixed a problem is statistically significant, we get a p-value of 0.5, which means that this result is not statistically significant. It does mean that there is no difference between the proportions of people who have ever fixed an error before and after the interventions.

Have you ever intentionally avoided laundry room peak hours?

In the first survey, 2 (5.1%) people indicated that they did not know that they could avoid peak hours, 6 (15.4%) people indicated that they never avoided peak hours and 31 (79.5%) indicated that they did. In the second survey, 1 (1.6%) person indicated that they did not
know that he could avoid peak hours, 14 (22.9%) people indicated that they never avoided peak hours and 46 (74.4%) indicated that they did. We ran two one-tailed chi-square test, one to test if the awareness of peak hours increased in a statistically significant manner and one to test if the avoidance of peak hours has changed in a statistically significant manner. When we run the awareness test, we get a p-value of 0.3, which means that the change in awareness, however it seems that the number people who do not know about peak hours has gotten less, is not statistically significant. When we run the test to see if the change in avoidance of peak hours is statistically significant, we get a p-value of 0.4, which means that the avoidance of peak hours has remained approximately the same before and after the interventions.

Whilst the previous questions were useful to see if our interventions have caused a change, as said before, it is hard to get statistical significance with our small sample. This is why the following questions will indicate if people found our interventions useful and if they have seen them, to further interpret the effect of our interventions.

**Do you think the laundry baskets provided in the laundry room are useful?**

12 (19.7%) people have indicated that they did not notice the baskets, 3 (4.9%) people have indicated that they were not useful and 45 (73.8%) have indicated that they are. This means that, even though there was no statistically significant change in basket usage, our baskets are definitely used to stop the congestion in the laundry room and thus lessen the appropriation problem, bringing the CPR dilemma closer to a CPR situation.

**Do you think the posters provided in the laundry room and online are useful?**

12 (19.7%) people have indicated that they did not notice the posters, 6 (9.8%) people have indicated that they were not useful and 42 (68.9%) have indicated that they are. This means that, even though there was no statistically significant change in the awareness or avoidance of peak hours, no statistically significant change of people getting impatient and throwing laundry on the floor, and no statistically significant change in whether people know how to fix errors on the screen, our posters are definitely noticed and appreciated. That they work can also be seen in the statistically significant change in the number of people who knew who to call when they had encountered a broken machine.

**Do you think the video on how to use the laundry website is useful?**

37 (60.7%) of the people have indicated that they have not seen the video, 8 (13.1%) people have indicated that it was not useful, and 16 (26.2%) people have indicated that it was useful. This means that we could have done better to make our video reach everyone, however it did receive positive responses on Facebook and a decent amount of views. This also could explain that the usage of the website did not rise, which means that more work
can be done on this front. However, more people did think that the video was useful than that it was not useful.
8. Appendix

A. Surveys:

A1: Baseline survey

- What do we want to know?
  1. How often do people use the washing machine?
  2. When do people do their laundry? And do people mind other timeslots/ days?
  3. Are people content with the laundry facilities?
  4. For the 2nd years, is it better or worse this year?
  5. Especially people that bring their laundry home, why is this?
     (prices, waiting time, quality machines, other)
  6. Do people pick their laundry up immediately?
  7. How often do people take out other people’s laundry?

- Questions?
  1. Which year are you in?
     Class of 2017
     Class of 2017 (Feb)
     Class of 2018
     Class of 2018 (Feb)
     RA
  2. Are you content with the laundry facilities in AVB? (yes, no)
  3. How often do you use the laundry facilities?
     Two or more times a week
     Once a week
     Every 2 weeks
     Every 3 weeks
     Every month
     never (go to question 6)
  4. Which day do you normally do your laundry?
     Monday
     Tuesday
     Wednesday
     Thursday
     Friday
     Saturday
     Sunday
  5. Have you experienced that people took out laundry that was not theirs (without permission)?
     Yes, I did it myself
     Yes, my laundry
Yes, someone else’s laundry
No, does this happen?

6. Is it clear to you which who to contact when there are technical problems with the washing machines? (yes, no)

7. If you never use the laundry machines in AVB, why is this?
   High prices
   Waiting time
   Quality machines
   Other

8. What should stay the same and/ or be improved concerning the laundry facilities in AVB?

A2: Baseline Survey – Overview of reactions
Do you ever use the function that sends you a text when your laundry is done on the laundry website?

- I was not aware of this possibility: 19 (43.2%)
- Yes: 0 (0%)
- No: 25 (56.8%)

Do you ever put your basket in front of the laundry machine whilst your laundry is in there?

- I was not aware of this possibility: 3 (7%)
- Yes: 29 (67.4%)
- No: 11 (25.6%)

Have you ever thrown other people’s laundry on the floor?

- Yes: 2 (4.7%)
- No: 41 (95.3%)

Have you ever called vastgoed if one of the machines was broken?

- I have never encountered a broken machine: 24 (56.8%)
- I have encountered a broken machine, and I called DUWO: 5 (11.6%)
- I have encountered a broken machine, but I did not know what to do: 10 (23.3%)
- I have encountered a broken machine, but I did not feel the need to take action to fix it: 4 (9.3%)

Have you ever fixed an error on the control screen of the laundry machines yourself?

- I was not aware of this possibility: 6 (14%)
- Yes: 15 (34.9%)
- No: 22 (51.2%)

Have you ever intentionally avoided laundry room peak hours?

- I was not aware of this possibility: 2 (4.7%)
- Yes: 33 (76.7%)
- No: 8 (18.6%)
A3: Second survey – Overview of reactions

In which year of LUC are you?

<table>
<thead>
<tr>
<th>Year</th>
<th>Number</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>First year</td>
<td>38</td>
<td>55.1%</td>
</tr>
<tr>
<td>Second year</td>
<td>25</td>
<td>36.2%</td>
</tr>
<tr>
<td>Third year or above</td>
<td>6</td>
<td>8.7%</td>
</tr>
</tbody>
</table>

Have you ever encountered problems using the laundry machines on floor 0?

<table>
<thead>
<tr>
<th>Response</th>
<th>Number</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>I never use the machines</td>
<td>7</td>
<td>10.1%</td>
</tr>
<tr>
<td>Yes</td>
<td>43</td>
<td>62.3%</td>
</tr>
<tr>
<td>No</td>
<td>19</td>
<td>27.5%</td>
</tr>
</tbody>
</table>

Do you ever use the laundry website to see which machines are in use?

<table>
<thead>
<tr>
<th>Response</th>
<th>Number</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>I was not aware of this possibility</td>
<td>12</td>
<td>17.6%</td>
</tr>
<tr>
<td>Yes</td>
<td>38</td>
<td>55.9%</td>
</tr>
<tr>
<td>No</td>
<td>18</td>
<td>26.6%</td>
</tr>
</tbody>
</table>

Do you ever put your basket in front of the laundry machine whilst your laundry is in there?

<table>
<thead>
<tr>
<th>Response</th>
<th>Number</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>I was not aware of this possibility</td>
<td>3</td>
<td>4.5%</td>
</tr>
<tr>
<td>Yes</td>
<td>47</td>
<td>71.2%</td>
</tr>
<tr>
<td>No</td>
<td>16</td>
<td>24.2%</td>
</tr>
<tr>
<td>I used the baskets provided in the laundry room</td>
<td>0</td>
<td>0%</td>
</tr>
</tbody>
</table>

Have you ever thrown people’s laundry on the floor?

<table>
<thead>
<tr>
<th>Response</th>
<th>Number</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>2</td>
<td>3%</td>
</tr>
<tr>
<td>No</td>
<td>65</td>
<td>97%</td>
</tr>
</tbody>
</table>

Have you ever called vastgoed if one of the machines was broken?

<table>
<thead>
<tr>
<th>Response</th>
<th>Number</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>I have encountered a broken machine, and I called vastgoed</td>
<td>3</td>
<td>4.5%</td>
</tr>
<tr>
<td>I have never encountered a broken machine</td>
<td>42</td>
<td>62.7%</td>
</tr>
<tr>
<td>I have encountered a broken machine, and I called DUWO</td>
<td>3</td>
<td>4.5%</td>
</tr>
<tr>
<td>I have encountered a broken machine, but I did not know what to do</td>
<td>8</td>
<td>11.9%</td>
</tr>
<tr>
<td>I have encountered a broken machine, but I did not feel the need to take action to fix it</td>
<td>11</td>
<td>16.4%</td>
</tr>
</tbody>
</table>
Have you ever fixed an error on the control screen of the laundry machines yourself?

- I was not aware of this possibility: 6 (9%)
- Yes: 22 (32.8%)
- No: 39 (58.2%)

Have you ever intentionally avoided laundry room peak hours?

- I was not aware of this possibility: 2 (3%)
- Yes: 47 (70.1%)
- No: 18 (26.9%)

Do you think the laundry baskets provided in the laundry room are useful?

- I have not noticed them: 14 (21.2%)
- Yes: 48 (72.7%)
- No: 4 (6.1%)

Do you think the posters provided in the laundry room and online are useful?

- I have not noticed them: 15 (22.7%)
- Yes: 42 (63.6%)
- No: 9 (13.6%)

Do you think the video on how to use the laundry website is useful?

- I have not seen it: 40 (59.7%)
- Yes: 17 (25.4%)
- No: 10 (14.9%)
B. DUWO Data

B1. Graph 1:

Average from 30 days before: No. of start per hour compared to no. of machines

B2. Graph 2:

Weekly load: No. of start per day compared to opening hours and no. of machines
B3. Graph 3:

![Graph 3]

B4. Graph 4:

![Graph 4]
B5. Graph 5:

B6. Graph 6:
B7. Graph 7:

B8. Graph 8:
B9. Graph 9:

![Graph 9: Average Daily Proportion]

B.10. - Average Daily Proportion

![Graph 10: Average Daily Proportion]

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Final Group Project - CPR 2015
B.11. - Monday 5/10, Daily Usage

B.12 - Tuesday 6/10, Daily Usage
B.13. - Wednesday 7/10, Daily Usage

B.14. - Thursday 8/10
B.15. - Friday 9/10, Daily Usage

B.16. - Saturday 10/10, Daily Usage
B.17. - Sunday 11/10, Daily Usage

Daily load: No. of start per. hour compared to no. of machines

[Bar chart showing daily usage]
C. Posters

C1. Laundry Room tips #1

**AVOID RUSH HOURS**

PEAK: 11am - 3 pm
Avoid Wednesdays (!) and weekends

**KEEP LAUNDRY BAG IN FRONT OF YOUR MACHINE**

Set your alarm on when you have to come pick up your laundry :)

Thank you.
C2. Laundry Room Tips #2

LAUNDRY ROOM TIPS

- AVOID RUSH HOUR
  PEAK IS 11AM–3PM

- SET AN ALARM

- KEEP YOUR LAUNDRY BAG/BASKET IN FRONT OF THE MACHINE YOU’RE USING
Washing machine Broken?

Here’s what you should do:

1. Put a sign “broken” on the machine in question,
2. Notify the housing council,
3. If an emergency (clothing stuck inside or other) call the vastgoedservice at: +31 70 33 68 888,
4. If vastgoed says that you should contact DUWO, tell them that you already contacted them and they told you to contact vastgoed (they are the ones responsible),
5. Best of luck!
Washing machine screen Broken?

What does the screen look like?

Push the little red cross at the top right of the error window over and over again.

It will take time but will clear up the screen.

Blank and non-responsive?

Tap on the screen a couple times.

If no response: tap at the top right of the screen on the metallic surrounding.

If no response: Call: vastgoedservice at: +31 70 33 88 888, and notify housing council.
C5. Poster placement 1
C6. Poster placement 2
C7. Laundry Baskets 1
D. Facebook Posts and Complaints

D1. Facebook Complaint 1

Hello everyone,
I was wondering if I'm the only one having issues with the washing machines. Every time I wash my clothes white soap residue is left on all of my laundry. This is especially visible on dark clothing. I am very unhappy with this since I now have to manually remove these soap stains from all of my clothes, doing exactly what we invented washing machines for in the first place.
I was wondering if there is anything that could be done in order to prevent this problem from recurring.

8 Likes 7 Comments

D2. Facebook Response to Complaint 1

Bene Colenbrander So I talked about this with Koen (DUWO's caretaker, a true legend). It's got to do with people adding their own soap to the machine. You might not do it yourself, but if the person who washed before you did it, there will be soap residue on your clothes, too. In fact, the person after the one who used extra soap is the one who gets most of the stains. DUWO washes the machines, empty, at 90 degrees to make sure they are clean, and that's essentially all they can do about it.

Morale of the story: Don't Use Soap.
17 February at 14:29 - Edited - Like 4
D2. Future Intervention to Change Soap

Hi everyone!
As part of a research project, my group and I would like to find out who (if anyone) might be allergic to the soap in the washing machines? Please just say yes to this post or tag anyone you might know who has this problem. We hope in time we can help fix it 😊
Thanks for your help!

Juliana Béraud likes this.

Jeanine Schriemer I think I might be
Unlike · Reply · 5 hrs

Bente Forkert Wouldn't say allergic, but my skin didn't particularly like it
Like · Reply · 4 hrs

Camille Accolas Any negative reaction has to be noted for 😊 so thanks!
Like · Reply · 4 hrs

Naomi Moonlion My skin also doesn't really like it, nothing extreme though.
Unlike · Reply · 2 hrs

Madeleine Verdaasdonk My skin didn't like it either, always had irritations
Unlike · Reply · 1 hr
Ladies and Gents,

We have come up with a new method of handling clothes in the laundry room. We now have 5 laundry baskets (which will be placed in the laundry room as of today) to be used to empty people's wet clothes into.

How this works SHOULD be self-explanatory, however here's a brief description:

To avoid dumping people's clothes on the floor while still using the washing machine without having to wait, use a laundry basket to empty their clothes into (unless they have placed a bag/basket of their own in front of the machine). The baskets are numbered so that people can empty clothes from the machine into the corresponding basket, so please make sure you use the right one. When you are done, please place the basket back in its designated spot to avoid messiness.

NOTE: These baskets are to remain in the laundry room at all times. Taking a basket outside of the room is considered as theft and if you are found to be guilty of this you will be punished accordingly.

If we all cooperate, this system will benefit us all. 😊
Michel Ivulic  
September 26 at 1:38pm

https://www.youtube.com/watch?v=w_CS8pJ-HUg

Do you always have to borrow someone’s laundry card? Do you always come downstairs just to find out all machines are occupied? Can you never remember what time your machine will be done?!  

FEAR NOT! Watch this instructional video on how to make your life easier!

AvB Laundry Machines - WEBSITE GUIDE!  
Laundry website: http://80.114.136.2/eng/ke.htm  
Android laundry app: https://play.google.com/store/apps/details?id=com.nsbasic.EasyLaundry1&hl=en iPhone and ...  
YOUTUBE.COM

Zach Malik, Danilo Paolo Bertazzo, Joost Thuis and 5 others like this.

Jeanine Schriemer Ana Pariente Marina del Valle get your shit together guys  
Like · Reply · 7 · September 26 at 2:38pm

Christina Hahü Kristy India  
Like · Reply · September 26 at 4:23pm

Margriet Oldenburg This makes my life so much easier when my floormates ask me how to do this, thanx! It took me half a year to figure it out myself btw:p  
Like · Reply · 1 · September 26 at 4:54pm

Zach Malik Great work Michel! 😊  
Like · Reply · 1 · September 26 at 5:12pm

Michel Ivulic shameless bump  
Like · Reply · September 30 at 8:41pm

Write a comment...
Hello AvB dwellers!

You might have noticed that there have been some changes to the laundry room. Here are all of them in one post!

We now have 5 laundry baskets in the laundry room to be used to empty people's wet clothes into.

The baskets are numbered so that people can empty clothes from the machine into the corresponding basket. When you are done, please place the basket back in its designated spot to avoid messiness.

NB: These baskets are to remain in the laundry room at all times. Taking a basket outside of the room is considered as theft and if you are found to be guilty of this you will be punished accordingly.

Check out this instructional video to learn how to use the laundry website, charge your laundry card, check machine availability, and more! https://www.youtube.com/watch?v=w_CS8pJ-HUg

Please notice the posters in the laundry room with extra tips, such as setting a timer to know when your machine is done, and instructions on what to do when the screen or the machines are broken. You can also find them in this dropbox file: https://www.dropbox.com/.../av0ml5.../AAC4pLifu0TwJKpnAZ0uts02a...

That's all, thanks!
Hey guys 😊

Ever been irritated by having to wait to do your laundry? Want to know what the peak hours are so you can avoid them? We’ve gotten data from DUWO regarding the peak hours of the facility, so we feel that sharing this with you will be helpful.

Generally, avoid Wednesdays, Saturdays, Sundays… but the following times have proven to be the busiest, so do try avoid them!

- Tuesdays & Wednesdays 11:00-17:00
- Thursday 22:00-00:00
- Friday 14:00-18:00
- Saturday 11:00-20:00
- Sunday 14:00-18:00

Also, we hope you’ve been checking out the posters in the laundry room with tips on how things work!

Spread the word, and good luck during reading week 😊
D7. Examples of Facebook Complaints

16 October 2014 - The Hague

All of the washing machines are done but still full. 4 of them have finished over 1h ago. Please can you take your laundry out and put a timer on your phone next time?

3 Likes

18 October 2014

Who reserved washing machine 1? Use it or delete your reservation.

3 Likes

1 November 2014

Hey guys,

Just a heads up that washing number 5 does not work. I paid for it but the machine keeps saying that the door is not closed. I repeatedly opened and closed it, but it still does not work. Is there a number i can contact?

5 Comments

9 November 2014

Washing machines 1, 2 and 3 are done, 4 is reserved but not being used. Please collect your laundry and/or delete your reservation. 😞

Like Comment

16 November 2014 - The Hague

Booking washing machines: If you book a washing machine, why not use it...? ... Currently, all 5 of them are booked - and empty (for a while already)...

8 Likes 3 Comments

12 December 2014

Laundry 3 & 5 are done!

7 Comments

Like Comment
19 December 2014

Whoever reserved the **washing** machines and isn’t using them... I want your head.

7 Likes 2 Comments

---

10 January · The Hague

Hi, my clothes are trapped in **washing** machine 2. Can anyone tell me who I could contact to get them out? 😊

4 Comments

---

13 January · The Hague · Edited

Could anyone who has the link that is used for loading our **washing** machine accounts please share it? Thank you 💘

2 Comments

---

28 January

Hey lovely avbers. All the **washing** machines are full but all are done. Please come pick your stuff up, I have to get my laundry done before I leave this weekend. **annoyed face**

58 Likes 7 Comments
### D8. Facebook complaints analysis results spreadsheet

<table>
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E. Emails

E1. Email to Duwo - Detergent & Reservations

Dear Indy,

I hope this message finds you well.
First of all, Zach and I have switched groups. That means that he is now dealing with the garbage issue and I am dealing with the laundry room.

I have a few questions regarding the laundry machines.
Firstly, would it be possible to change the cleaning detergent used, as some people have been complaining about allergies to the one currently being used (so perhaps a hypoallergenic one)? Or otherwise is it an option to allow people to use their own detergent? (because we've also been having complaints that the current detergent leaves white stains in the clothes)

Secondly, an issue we have noticed is that when people reserve the laundry machine they from time to time either:
1. don't use it straight away (they wait a while after they've reserved it before they come and use it)
2. don't use it at all, which can be irritating for people when all are being used/more are reserved.

Therefore, we were wondering if it would be possible to have people pay upfront when they want to reserve a machine, that way we can avoid people having to wait too long for a machine to become available.

I realize this may be a lot to ask, but we truly believe this would be mutually beneficial for both DUWO and the students.

Kind regards,

Michael
Dear Mr/Mrs,

As part of a research project for a Common Pool Resource Management course (University College of Leiden) we have been working on helping solve recurring issues in the laundry room in the AvB student campus. The main issue we attempted to solve was the waiting time users have to face when doing their laundry. There are several key issues that interrelate with this problem:

1. Technical issues: the control screen which manages the machines very often comes up with “Error 059” making it impossible to reserve a machine.
2. Reserved laundry machines limit other users from having access (the time of reservation is too long)
3. Machines sometimes break, which points to the fact that they may not be well maintained (students using their own soaps, other correlating technical issues)
4. The response time between the building and Vastgoed (agency that takes care of emergencies) is often problematic especially on weekends when many students need to have access to the machines
5. The soap in the machines has caused irritations and other unpleasant reactions for some users and also seems to stain clothing with residue

In our project we have tried to resolve some of these issues by implementing the following interventions. Posters raising awareness to how to respect others in doing your laundry by picking it up on time (setting an alarm), we stated the hours and days of the week that are peak for doing laundry which should be avoided and we put in baskets so users can remove other people’s laundry if they have not come to pick it up on time. Furthermore we gave a few instructional tips on how to solve the screen problem and how to use the website efficiently as well as provided the numbers of who to call when a bigger technical problem occurs.

We would like your help in maintaining the work we have started by discussing possibilities of future interventions we might be able to put in place. This would benefit the users of the AVB laundry room as well as the DUWO and Vastgoed services who may not need to intervene for minor technicalities. We would like to suggest providing the RAs or AVB Housing with the key to fix the control screen so as to have a quicker fix to a problem that is easily fixed. We would also like to know whether the reservation system could be adapted either to users paying upfront or for the reservation time frame to be shortened. Changing or removing the soap in the washing machines may also be a potential future intervention that would be worth considering.

We hope that this information may be useful to you. Hopefully, we can remain in contact in the future, to discuss and take action in order to optimize and make more efficient use of the laundry room facilities.

In the hope of your kind reply,

Yours sincerely,

Camille Accolas, Michael Nyoike, Juliana Rademaker,
Michel Ivulic, Kelly Ursem, Danilo Bertazzo, Lisa Smits.
F. R-Script Data

F.1 Rscript used for data analysis

setwd("C:/Users/Lisa/Documents/Rwork")
resp1 <- read.csv("laundryroom1.csv", header=T)
resp2 <- read.csv("laundryroom2.csv", header=T)
resp1 <- data.frame(resp1)
attach(resp1)
resp1[order(Have.you.ever.encountered.problems.using.the.laundry.machines.on.floor.0.),]
answers1 <- resp1[-c(1,2,3,4,5,6),]
detach(resp1)
attach(resp2)
resp2[order(Have.you.ever.encountered.problems.using.the.laundry.machines.on.floor.0.),]
answers2 <- resp2[-c(1,2,3,4,5,6,7),]
detach(resp2)
problems1<-table(answers1$Have.you.ever.encountered.problems.using.the.laundry.machines.on.floor.0.)
problems2<-table(answers2$Have.you.ever.encountered.problems.using.the.laundry.machines.on.floor.0.)
website1 <-table(answers1$Do.you.ever.use.the.landyry.website.to.see.which.machines.are.in.use.)
website2<-table(answers2$Do.you.ever.use.the.landyry.website.to.see.which.machines.are.in.use.)
vastgoed1 <-table(answers1$Have.you.ever.called.vastgoed.if.one.of.the.machines.was.broken.)
vastgoed2 <-table(answers2$Have.you.ever.called.vastgoed.if.one.of.the.machines.was.broken.)
baskets1 <-table(answers1$Do.you.ever.put.your.basket.in.front.of.the.laundry.machine.while.your.laundry.is.in.the.)
baskets2 <-table(answers2$Do.you.ever.put.your.basket.in.front.of.the.laundry.machine.while.your.laundry.is.in.the.)
floor1 <- table(answers1$Have.you.ever.thrown.other.peoples.laundry.on.the.floor.)
floor2 <- table(answers2$Have.you.ever.thrown.people.s.laundry.on.the.floor.)
errorscreen1 <-table(answers1$Have.you.ever.fixed.an.error.on.the.control.screen.of.the.laundry.machines.yourself.)
errorscreen2<-table(answers2$Have.you.ever.fixed.an.error.on.the.control.screen.of.the.laundry.machines.yourself.)
peakhours1 <- table(answers1$Have.you.ever.intentionally.avoided.laundry.room.peak.hours.)
peakhours2 <- table(answers2$Have.you.ever.intentionally.avoided.laundry.room.peak.hours.)
interventionbaskets <- table(answers2$Do.you.think.the.laundry.baskets.provided.in.the.laundry.room.are.useful.)
interventionposters <- table(answers2$Do.you.think.the.posters.provided.in.the.laundry.room.and.online.are.useful.)
interventionvideo <- table(answers2$Do.you.think.the.video.on.how.to.use.the.laundry.website.is.useful.)

problems1
problems2
problems <- prop.test(c(30,42),c(39,61), p = NULL, alternative = c("two.sided"), correct= TRUE)

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website2
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websiteuse <- prop.test(c(34,38),c(39,61), p = NULL, alternative = c("greater"),correct=TRUE)

vastgoed1
vastgoed2
broken <- prop.test(c(20,37),c(39,61), p = NULL, alternative = c("two.sided"), correct= TRUE)
vastgoed <- prop.test(c(0,37),c(3,61), p = NULL, alternative = c("less"), correct= TRUE)

baskets1
baskets2
basketawareness <- prop.test(c(2,9),c(39,61),p = NULL, alternative = c("greater"),correct=TRUE)
basketuse <- prop.test(c(29,46),c(39,61), p = NULL, alternative = c("less"), correct=TRUE)

floor1
floor2
floor <- prop.test(c(2,2),c(39,61), p = NULL, alternative = c("less"), correct= TRUE)

errorescreen1
errorescreen2
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correct=TRUE)
errorescreenuse <- prop.test(c(15,22),c(39,61), p = NULL, alternative = c("less"), correct= TRUE)
peakhoursawareness <- prop.test(c(2,1), c(39,61), p = NULL, alternative = c("greater"), correct=TRUE)
peakhoursuse <- prop.test(c(31,46), c(39,61), p = NULL, alternative = c("greater"), correct=TRUE)

interventionbaskets
interventionposters
interventionvideo