

Team 6: Software Requirement Course

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Domain Engineering: Cash for Chores

- **Domain-specific stakeholders]**

Cash-for-chores stakeholders:

a. **Service providers:** a group of people who are interested in providing a specific kind of service so that they can earn money. Some of those services that may be included are:

- Car wash service:** service where a vehicle may be washed by hand or with a specialized equipment
- Grass cutting service:** service where a terrain grass gets cut with a tractor or a pruner, depending on the terrain size.
- House cleaning service:** service where a house gets cleaned either partly or in its entirety and may include dish washing service.
- House painting service:** service where a house gets painted in the interior, the exterior or both.
- Moving service:** service which facilitates the process of moving from one place to another. The service provider may provide a vehicle such as a pickup or a truck to facilitate the process.
- Food delivery service:** service in which a person delivers a desired food order to the client.
- Equipment repair service:** service where a hardware gets repaired, such as cellphone, computer or tablet.
- Seamstress service:** service where the client's clothes are arranged to fit a desired size or where the seamstress can fix any gaps that the clothes may have.

ix. **Transport service:** service where a designated driver transports the customer from point A to point B with the price that the driver proposes.

x. **Pipe repair service:** service where any broken water pipe will be repaired.

xi. **Pet babysitting service:** service where a person simply takes care of the people's pet.

b. **Service consumers:** a group of people who are interested in receiving a specific kind of service. There may be many reasons why they are interested in receiving a specific kind of service, included, but not limited to: the fact that it is a service that only certain people can provide, they may have lack of time, maybe they just don't want to do some work at home because of laziness, lack of equipment, or maybe they are not competent in the work they want to be done.

c. **Software suppliers:** our software to be implemented may require many special tools, such as a payment system, a database, secured login, messaging tools, etc. Those will be the tools that or developers are going to use to make the application.

- Note that even though, the stakeholders are different, they have similarities between each other. For example, there are different kind of services providers, but all of them have a common goal, which is the fact that they want to provide a service. The same thing applies to the suppliers and the staff members. The suppliers are looking to supply the necessary tools for our domain and the staff should work as a team so that the domain functions properly. But the service consumers, for instance, have a connection with the service providers, because if there aren't services providers, then the goal of having a desired service won't be completed. Also, we must consider that the service consumers and the service providers are going to rely on a software to communicate between each other. Hence, software developers must have to make sure that they implement a secure system that functions consistently with the smallest number of bugs, because a buggy, hard to use and secure less software won't attract customers. Graphic designers also play a crucial role in the development team since an appealing design is preferred in order to make the users comfortable when using the software.

- We mentioned how each role is related to each other, but they also differ in many aspects that can be inferred in their description. Each of them plays a role that the other stakeholders can't provide. For example, a service consumer may not be able to do a specific kind of task that a service provider is able to provide, and neither the service consumers nor the service providers won't have the required knowledge to build a software.
- Stakeholders access may be limited, since at first instance we may not have service providers available as soon as the apps get released. So, in order to have the service providers, we must first develop the app properly so they can get to promote their service. In order to develop the application properly, we must have access to some software developers that will be developing the app. Software developers may be hired according to their knowledge, but since we are a starter company, we don't have high expectations. Any software developer that are willing to learn the necessary tools for the app development is welcomed. As soon as there are enough software developers to develop the application, they need to get familiarized with certain software tools that will be necessary. Getting access to the software tools are easy, since many of them are open to the public, but some things may have a cost, such as the database (if we plan to have a big database). In this case, then we may need to have an indirect or direct contact with a software supplier that focuses on databases so we can use some of their cloud databases for a cost. After the developers get to create the software, then the hiring process for the customer service teams can begin. Finally, after having an established application with the customer service, then the service providers can begin to promote their services via the application, which will attract the service consumers.

- **Preliminary domain description**

I.Terminology:

- a. **Service:** work that is provided for another who acquires such a service
- b. **Household:** of use in a home
- c. **Household Service:** service provided in a home by a household service provider

- d. **Service Browsing:** the activity of browsing for a household service and a household service provider that provides such service
- e. **Service Acquisition:** the act of acquiring a household service from a household service provider
- f. **Analyze:** to examine carefully and in detail to identify causes, key factors, possible results [citation needed]
- g. **Discriminate:** to make a distinction in favor of or against a person or thing based on the group, class, or category to which the person or thing belongs rather than according to actual merit. [citation needed]
- h. **Service Provider Revision:** the result of discriminating the professional profile, and analyzing the existing household service feedback, of a household service provider to form opinions and possibly take further actions, i.e. acquiring the service.
- i. **Service Review:** the result of providing feedback on a household service provided by a household service provider in relation to the household service quality
- j. **Service Provision:** the act of a household service provider providing a service
- k. **Service Provider:** individual with a professional profile; provides household services; receives reviews from the household service customer regarding the quality of the service provided
- l. **Service Customer:** individual with a profile; performs household service browsing, and revision; acquires household services; provides household service reviews
- m. **Quality:** degree or standard of excellence [citation needed]
- n. **Service Quality:** defined by the household service customer,
- o. **Feedback:** a reaction or response to a process [citation needed]
- p. **Positive Feedback:** feedback that implies satisfaction with a process
- q. **Negative Feedback:** feedback that implies dissatisfaction with a process
- r. **Service Feedback:** feedback on a provided household service; it can be negative or positive; it is given by the household service provider
- s. **Presentation:** a manner or style of speaking, instructing, or putting oneself forward [citation needed]
- t. **Profile:** a summary of a process, activity, or set of characteristics [citation needed]
- u. **Professional Profile: (of a Household Service Provider)** contains a description of the household services provided and collected household service feedback⁴

II. Domain Description:

- a. Household Service Providers promote their services through:
 - i. Word of mouth, by talking to people, potentially creating a web of concurrent customers, limited to the reach of those people
 - ii. Posting ads in public forums (newspaper, website, etc.)
 - b. To *collect feedback* on the service from a customer, the Service Provider relies on:
 - i. Word of mouth, the customer may or may not share this feedback to other people; potentially creating a web of concurrent customers through positive feedback or losing customers due to negative feedback. The spread of feedback in this way is slow. Additionally, the customer may share the feedback with the service provider, then the service provider would have to decide what to do with said feedback, i.e., not make it public if it is negative feedback.
 - c. Household Service Customers *browse* for household service providers to *revise* their professional profile and *acquire* their services to *review* their service.
 - i. To *browse* for a potential service provider, the customer must search through: Word of mouth, by talking to people if they can provide the required service, or if they know someone who can, potentially finding someone as people inquire. Searching for ads in public forums (newspapers, website, etc.). Posting service request in public forums (newspapers, website, etc.)
 - ii. To *review* a service provider's service, the customer must rely on: Word of mouth, by talking to people, customers may share their experience with others. Customers may give feedback directly to the service provider. Post a review in a public forum
 - iii. To *revise* a service provider's professional profile before acquiring their service, the customer judges whether the service provider "meets" their desired standards (i.e. works "fast", quality of equipment, quality of service, presentability, etc.) These standards are set by the customer and vary per individual. For such reviews the customer must rely on: Word of mouth, by talking to other people, whom may have received the service or heard from someone who has; or directly speaking with the Service provider. Looking at the person's ads on public forums
- **Domain questionnaire.**
 - Service Provider:**

- How do you promote your service? What is relevant when promoting your service? What is difficult?
- How does feedback help you broaden the amount of people who look for your service?

Service Customer:

- Is feedback from other customers enough for you to acquire a service from a person?
- What is relevant when looking for a household service provider and acquiring their household service?

- **Domain description units.**

- **Persona 1:** Pedro Hernandez, *the manager*

Works at Sam's as a manager and is 29 years old, has a degree in finance. He lives with his single mother, who is 60. Deals with back pains that limit the amount of manual labor he can do. Early in the mornings he wakes up and goes running during the week before going to work. He tries to do body strengthening exercises to help with his back problems, but he can't strain himself too much or the pain gets worse. He loves spending time with his mother, but Pedro has reached a point in his life that he wants his own space and is trying to move out from his mother home, into a 1-bedroom apartment. Because of his back pains he can't move his things by himself and requires assistance. He is looking for someone to help but does not know who to call.

- **Is feedback from other customers enough for you to acquire a service from a person?**

- If the feedback gives a good detail on the service that was provided and how well it was done, I wouldn't have a problem.

- **Units:**

- Feedback gives detail about the service provided.
 - Feedback gives detail about service quality

- **What is relevant when looking for a household service provider and acquiring their household service?**

- That they can accomplish the task that I need to be done, that they have some level of professionalism, that they dress decently and behave in a good

manner; easy to contact, I don't want to deal with someone who comes and goes as they please.

- **Units:**

- The way a service provider presents themselves is valuable when acquiring their service.
- Level of professionalism is a measure of acquiring the service or not, for the service customer
- Service customer looks for contact information

- **Persona 2:** Joshua Steel, *the handyman*

Joshua Steel, a 33-year-old local handyman, lives with his wife Josie (31 years) and his daughter Ellie (3 years) in the suburbs. Every morning on weekdays, Josie takes their daughter to the preschool and heads to work at her part-time job at *Bed Bath and Beyond* while Joshua tends to his appointed service visits. In their spare time, Joshua and his wife like to take Ellie to art exhibits and parks. He really values his daughter and considers her the most beautiful thing that has happened to him, so he pushes himself to do his best as her dad. Joshua, being the hard worker that he is, always strives to get his name out into the public so the locals think of him when they need something fixed. He goes around posting ad papers in busy (and, of course, legal) spots and carries around business cards to distribute as he sees fit. However, these tend to be overlooked so he doesn't work as much as he wishes he could. Because of this, he generally does around 3-6 jobs a day. Regardless of that worry, he constantly looks forward to helping his clients and he always tries to provide a quick quality service just like his dad taught him to. When he has extra cash, Joshua likes to take Josie out to fancy restaurant dates. His main hobbies are watching nature documentaries and watching YouTube videos about "cool handyman stuff", as he calls it.

- **How do you promote your service? What is relevant when promoting your service? What is difficult?**

"Well, I promote through my cards and the ad papers I place in the area. It's...sort of unreliable. Sometimes I'll get great yields, sometimes no yield, sometimes small yields, it can be a bit random which is a big difficulty. When I promote my services, I find it most important for people to know I'm a trustworthy, experienced handyman who will do a great job in a short amount of time. But there's only so much convincing

an ad can do...So I ask my customers to recommend me to friends and family who need a handyman, that does pretty well.”

- **Units:**

- A service can be promoted. It may or may not affect customer yield.
- Service providers provide personal details, professional details based on work experience
- Service providers rely on their customers recommending their service

- **How does feedback help you broaden the amount of people who look for your service?**

“Feedback is super useful in my line of work. Positive feedback is extremely reassuring because that means customers are more likely to return to my services and refer me to their friends and family which is fantastic. Being someone’s regular handyman gives my job a lot of sustainability in the long run since it kind of combats that uncertainty of who’s going to call me to do a job for them after I put an ad out...Also, again, it makes it more likely for them to recommend my services. Negative feedback is rare but also extremely important, I really don’t want my reputation to suffer because of a bad job and I’m constantly looking to improve myself, because I’m not perfect...yet (laughs). Anyway, that’s why I generally fix bad jobs for free. Sure, it costs time, but it provides customers more safety.”

- **Units:**

- Service provider receives feedback from the customer
- Positive feedback augments customer yield, and recommendations
- Service providers may have concurrent customers
- Negative feedback affects service provider’s reputation
- Service provider negotiates with customer on negative feedback, not that it will be removed, but there is a line of communication to discuss the situation and improve service provider’s skills

- **Persona 3:** John Lopez, 19 years old, high school dropout

John Lopez is a 19-year-old teenager who lives with his grandmother, Shelsy (59 years old). He dropped out of high school when he was in 11th grade and has been unable to find a job since then. The main reason why he decided to dropout was because studying was not his passion and his grandfather's death made things even more complicated. Most of the jobs require a high school diploma, hence, the main reason why he has been unable to find a job. However, he enjoys doing chores such as mowing the lawn to do a living and is very talented when it comes to tasks such as repairing vehicles, because he watched his grandfather Chris to repair vehicles since he was 6 years old until his grandfather passed away in an airplane accident, when he was 16 years old. The thing is, he doesn't have an effective way to tell people about his availability on doing such services. Only his neighbors are the ones who pay him sometimes to mow their lawns, and very rarely have they needed his help on repairing their vehicles since their vehicles are in good condition. John wishes to expand his service and is looking for an effective way to do so. He knows that not many people are up to do what he can do, and it may be a perfect opportunity for him to provide such services and the clients to receive such services.

▪ **How do you promote your service? What is relevant when promoting your service? What is difficult?**

- John relies on the word of mouth and has been in the disposition on providing those services about since when he was 17.
- John hasn't had that much luck on social media, since people's perception toward him is not good because he is a high school dropout.
- However, he wishes to have a new beginning where people don't perceive him as a failure. Only a few amounts of people believe in him, particularly those who know him well.

▪ **Units:**

- Service providers may have concurrent customers
- Service provider's preparation affects the customer yield

○ **How does feedback help you broaden the amount of people who look for your service?**

- Not much. In fact, John may be lucky enough if he gets to attend 5 clients in a single month.
- **Units:**

- Feedback is not useful [in broadening the customer yield of a service provider] if it's not provided
 - Feedback has reach
- **Persona 4:** Natalia Roman, *the college student*, 20-year-old, single

She's an, honor-roll, Industrial Engineering full-time student at the University of Puerto Rico at Mayaguez. She's the vice-president of the National Society of Professional Engineers Student Chapter, and an active member of the Institute of Industrial Engineers Student Chapter at the university. Additionally, Natalia gives workshops and plans networking activities in the organizations. She is an avid animal lover; and currently has three cats, Tabby, Tula, and Teri, and a dachshund named Tiny. She dislikes leaving them alone for a long time when she is at the university. She would be destroyed if anything happened to them. She relies on her aunt Patricia to watch over them when she is performing her duties as a student, however, her aunt just checks if they have food and water. When her aunt is not available, Natalia asks her neighbor Leo to check on them if he is available, because she doesn't want to bother him.

 - **Is feedback from other customers enough for you to acquire a service from a person?**
 - Generally, yes. Feedback is useful for me to see what type of experience I might have if I choose to hire the person. Obviously, if the feedback is mostly good, I can consider hiring the person. If it's just bad, then I won't. That's where feedback comes in handy. It creates a layer of transparency between me and the person who I'm considering hiring. If I don't have any feedback at all, I wouldn't know what to expect, and would be hesitant about hiring the person.
 - **Units:**
 - Feedback gives detail about the service
 - Feedback gives detail about the service provider
 - Positive feedback augments may augment customer yield
 - Negative feedback diminishes customer yield
 - No feedback diminishes customer yield, since the service provider may be overlooked

○ **What is relevant when looking for a household service provider and acquiring their household service?**

- If there is feedback, then feedback. If the person is close, for example, if they are a relative, a family member, it adds a degree of trust I may not find with a stranger. If I can feel like I know them on a personal level that's a plus.

- I think that their appearance is very important, somebody that takes their work seriously, takes care of their equipment, and look professional.

- I like things to be clear cut, if they say the time frame is from x to y, then I expect the job to be done by then.

- If it's available, then I compare the prices, of course, sometimes one must compromise when the budget is tight. I don't have a job, so I rely on my student loans.

- **Units:**

- Feedback is used to look for a service provider

- Recommendation is considered when looking for a service provider

- Service customer may create a *personal relationship* with service provider

- Professionalism in physical presentation and work is a measure for acquiring the service

- Service customer looks for details such as service time frames and service prices

- **Persona 5:** Carlos Romero, *car washer*, 19-year-old

Part-time student getting a degree in Auto Mechanics. He lives in a rented apartment close to college with a Siamese cat named Lola. His family doesn't support him due to him rejecting being a doctor, so he left to pursue his actual dream: Cars. He has a passion for cars and their aesthetics with his favorite being a 1970 Challenger R/T muscle car. Whenever he is not studying, he attends car exhibitions where people from all over the country come and showcase their cars. Car exhibitions, for him, are also a way to get some exposure as a car washer, where he gives out business cards to gain customers and is his main source of income to pay his bills. On the weekends he likes managing a social media page called Romero Detailing where he

presents the cars' before and after his treatment to others and gives out special discounts to a selected few. He wishes he had a broader audience to finally be able to get his dream car.

○ **How do you promote your service? What is relevant when promoting your service? What is difficult?**

- Carlos uses social media and business cards to promote his service.
- The person acquiring the service or someone close to him needs a vehicle for Carlos to clean and provide his services.
- It is hard to reach out to others out of the circle of people surrounding his friends and/or car exhibitions he attends due to him needing to spend more money than he earns in ads or posting flyers around town.

▪ **Units:**

- Services are promoted and provided
- Service provider may have a concurrent customer
- Service promotion has reach
- Service providers assess their client's condition to provide the service

○ **How does feedback help you broaden the amount of people who look for your service?**

- Carlos prides himself in his work and since detailing cars and cleaning them is task that requires attention to detail, good feedback on this means that people appreciate his work and others might want the same special treatment done to their vehicles.

▪ **Units:**

- Feedback provides details of the service, details related to the quality of service
- Positive feedback augments customer yield

- **Domain description unit indexes.**

Index the domain description units tagging each. You must decide on the tags to use as well as on the appropriate value for each tag.

○ Social Media, business cards, word of mouth, ads are all different methods household service providers use to market their business and potentially get new customers. Hence, we can abstract them into one class: marketing

- Car washer, gardener, mechanic, painter, handyman, i.e. service providers, etc. All represent a type of job that can be represented by one class: services.

- Writing a good review on the task performed by others on some social media, spreading the word that a person performed a good job doing certain work, or hearing that someone is good at a certain job. They are ways that people spread personal reviews around. Hence, we shall abstract them into one class: positive feedback.

- Asking others in person or via some forum if a certain individual performs a good job, if the way he presents himself is acceptable, if the person is reliable, if the person is easy to contact and work with. These are all questions asked when searching for a service provider. We shall abstract them into one class: feedback.

- Self-marketing, positive feedback, negative feedback, the preparation a service provider has can all affect in a positive or negative way how customers perceive the service provider. They all could affect positively or negatively the number of customers the provider receives. Hence, we shall abstract them into one class: customer yield

- **Domain inconsistencies.**

Analyze your domain description units for possible inconsistencies. Even if you do not find any, come up with a few examples of likely inconsistencies.

- Feedback, good or bad, is not always perceived well by or useful to service providers which leads to an inconsistency in opinions on the matter.

- To some service providers this may help them improve their craft and reach out to more people as is the case for Carlos and Joshua

- Other times it provides little to no help due to prejudice or situations out of reach of the service provider as is the case for John.

- The number of customers that a service provider has is not always proportional to the amount of positive feedback customers give to said service provider.

- This is showcased in the statement by John where his customers have not increased.

- Opinions on this matter are inconsistent because for some service providers positive feedback have proven to give an increase in customers whereas for others this has shown to have no effect, or the relationship is not as proportional as it may sound.

- Negative feedback is perceived by the customers as a red flag while it is the other way around for service providers.

- For service providers this sometimes gives them a reason to improve and better themselves which leads to an issue of introducing full transparency in the side of the service providers.

- Negative feedback may mean that some service providers will improve while others may not but for customers this is always perceived as a negative quality when looking for service providers as is the case for Natalia.

- **Domain conflicts.**

Analyze your domain description units for possible conflicts. Even if you do not find any, come up with a few examples of likely conflicts.

- “No feedback diminishes customer yield, since the service provider may be overlooked.”
 - A possible statement that would cause conflict with this statement would be: “New service providers would grow in a feedback-rich environment.” There is a clear conflict because a provider could either get overlooked in a feedback-rich environment or grow rapidly in it relative to providers in the given field with less feedback.

- Upon further analysis of feedback-rich environments, it can be deduced that in said environments, small providers can have difficulty in advancing in their business. In an environment where at least one piece of positive feedback is available for person X and not for person Y, person X has a larger chance to receive a customer, thus gaining more feedback and increasing their chances of receiving the next customer. Person Y can have a difficult time advancing in their business due to this.

- As we can see, the service providers really appreciate their feedback reaching potential new customers. From all the personas that provide household services, all not only benefit but also admit on having some reliance on the spreading of positive feedback. Thus, we may deduce that they would generally be in favor of a feedback-rich environment. However, we did see customers like Natalia expressing that they will not pick people with negative feedback or no feedback at all. From this, we see the rise of a new standpoint that directly conflicts with household service providers who approve a feedback-rich environment. These would be household service providers who would rather have their customers abstain from giving feedback. This would be a standpoint directly against a feedback-rich environment.

- It would be natural for some service providers to be against a feedback-rich environment in fear of having all their errors visible to the public, especially future customers.

- **Domain concepts.**

Analyze the domain description units to abstract from them relevant common concepts.

I. Concepts:

a. Customer yield:

- i.(Of a service provider) Quantifiable characteristic of the amount of people who acquire the service from the provider
- ii.Measure of *success* for a service provider
- iii.Customer-Provider Relationship

b. Feedback:

- i.Feedback is provided by the service customer
- ii.Feedback gives detail about the services provided, details about the quality of the service
- iii.Feedback is given to the service provider.
- iv.Positive feedback:
 - 1. Augments customer yield
- v.Negative feedback
 - 1. Diminishes customer yield

c. Marketing:

- i.Set of processes and institutions that enable the creation, communication, and delivery of offers, for the exchange of goods and services
- ii.(for a service and service provider) Attempt to call the attention of people into becoming service customers through different initiatives (ads, etc.)
- iii.Professionalism of a service provider
 - 1. Set of characteristics which a service provider presents to market their service, which include, service description, preparation details (if they have any certifications, license, etc.), collected feedback, presentation i.e. appearance of equipment, previous work

d. Service:

- i.Service Customers

1. Service Customers look for service providers. They focus on contact information, feedback, service descriptions, and a possible relationship with the provider when looking for one.

ii. Service Providers

1. Service providers promote their services, they provide services, they provide service descriptions, they provide preparation details (if they have any certifications, license, etc.), they collect feedback on their service, and they have contact information.

- **Domain-specific verification.**

Our domain description will usually lead to the stating of properties that hold in the domain. We wish to have few axioms (properties that need to be accepted as true in the domain). Domain verification checks that the remaining properties can be justified by reasoning from the axioms.

Suggest some issues that may need special attention during domain verification.

a. ***If feedback is received, a service was provided:***

This property will always hold whether the feedback is positive or negative, **therefore it is an axiom.** We can prove this by finding the contrapositive, which is:

If a service is not provided, then feedback will not be received.

This statement is true because if a service was not provided, there is no way to rate the performance, therefore feedback will not be issued nor received.

b. ***If the service is completed successfully, positive feedback will be received:***

Although this may not always be the case, as whether if the feedback is issued or not is at the client's disposal, we can reason about this **property** with the fact that if feedback is present, then a service was provided (Axiom a).

c. ***If a service is accepted, a valid payment method is present:***

This property (axiom) always holds because if a service was provided, then the client has a valid form of paying (be it by credit, cash, agreement, etc.), accepted by the provider.

This can be proven like Axiom a, with the contrapositive:

If a valid payment method is not present, a service will not be provided:

This is true because if the client does not provide a valid payment method, the provider will not accept the task, therefore the service will not be executed.

d. *If a service is requested, a provider will be notified:*

This always holds as client-provider communication is done either directly or by intermediates who are assigned to that task. Also, if one provider is not able to carry the task, the client will keep searching until one is met who can. The statement can be proven with the converse:

If a provider is notified, then a service was requested:

This is true because the only way a provider can be notified of a request if it's made in the first place. Therefore, this property is an axiom.

e. *If a service is requested, the provider will accept it:*

Because of Axiom c, this **property** will not always be true but, because of Axiom d, the client can continue requesting the service until a provider who will accept it is found.

f. *If the service is being handled, then the provider has the knowledge and equipment to do so:*

Although true for most of the time, there may be occasions where a provider accepts a service without having proper knowledge or equipment. Because of Axiom a, people have a way of finding out this information prior to hiring a service provider.

- **Domain-specific validation.**

Based on the domain concepts and possibly an accompanying narrative, suggest some issues that may need special attention during domain validation.

During domain validation, we may need to lend special attention to the following:

- Marketing
 - We want to further understand if there are more means that service providers currently use to advertise their services and how effective those are individually and in comparison, to the known means.
- Service

- We want to lend special attention to the service providers within the service concept in order to learn more about the types of different certifications they have, if any, if applicable.
- We also want to lend special attention to the prices for the services offered by service providers and how those prices possibly change over time for seasonal reasons, to compete with other providers, et cetera.