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Development of a service to increase sustainability of HBS students' relocation

CAPSTONE PROJECT – FALL 2019

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ABSTRACT

Over the last century, the world has changed: what was once a country-based society became an intertwined mesh of relationships and exchanges between opposite sides of the worlds, through a transformation fueled by easier access to dispersed information, by easier means of communication, and by a far easier access to travel options. The last point, in particular, dramatically increased the number of people who move across countries and continents to pursue their education or job-related goals, leading to a dramatic rise in short-term relocation practices, particularly evident in cities like Boston that provide top-rated institutions in multiple fields (e.g. Healthcare, Education, Biotech, etc.).

Such rise in short-term relocations, however, carries a huge environmental cost, especially in the area of furniture waste: the limited time-horizon of the relocation (e.g. just two years for graduate students), the intrinsic temporary usage of the purchased furniture, and the low-cost of many of the leading furniture shops, have led to the rise of the "fast-furniture" phenomenon, where furniture, once considered a durable item in one's life, became an "easy-to-dispose" household item, with growing impact on the sustainability of the relocation processes. For example, recent studies show that furniture is the least-recycled household waste and that more than nine million tons of furniture are in landfills in the US alone (EPA: United States Environmental Protection Agency, 2019).

This paper represents an attempt to fight such phenomena and to increase the sustainability of the relocation processes for the students of Harvard Business School through the development of a service able to intercept the relocation journey of these students in multiple points (pre-

relocation, settle-in, move-out). This service is designed to provide more sustainable solutions to the students' needs through three approaches:

1) The first offers pre-relocation consulting services as a way to "influence" choices with lower footprints;
2) The second consolidates the furniture demand of the pool of relocating students as a way to support smaller local furniture providers and to optimize the handprint of the supply chain;
3) The third increases the frequency and quality of the second-hand furniture market by supporting students during the move-out process, where the normally disposed furniture will be collected, refurbished and made ready-to-use during the following relocation cycle.

The detailed design of this service has been achieved through a combination of human survey, material LCA analysis, business model design and operating model design, and it is the starting point for a detailed business plan development that will continue in the near future towards an ideal lunch of the service for the 2020 academic year.

I. Introduction

I.1. PROBLEM DEFINITION

Every August, thousands of students move across the U.S, often from overseas locations, to start their academic studies. While most students move to their college to pursue their bachelor's degrees, there is a steadily increasing number of students who relocate to join a graduate program, and this poses more relocation challenges for a variety of reasons. Today's job market, with higher mobility, poses similar challenges for workers who have to move to new cities for a limited time. In both cases, foreign citizenship often complicates the relocation dynamics: foreign students or workers with limited knowledge of cities, habits or services often face even bigger relocation challenges.

Boston, as other metropolitan U.S. cities with many schools and companies, currently faces this problem. In fact, as a hub for universities, hospitals, pharmaceutical facilities and headquarters, Boston is one of the "top" destinations for short-term relocations:

- Boston hosts approximately 150 thousand students in its institutions of higher learning (Peter Meade, 2010)
- Boston hosts approximately 30 thousand physicians, many of which relocate to Boston for their residency program and then move elsewhere [1]

[1] "Boston is a mecca of medicine, home to some of the most prestigious hospital and medical school, physicians and medical scientists in the world…In fact, 13 of the Boston's 50 largest employers are hospitals". (Edwards, 2012). "Boston is the leader in nation's healthcare with 15 acute care hospitals an several satellite locations" (BostonMagazine, 2018) with 27845 physicians with a full active license

- Boston is the biotech cluster in the world for pharmaceutical factories with approximately 35 thousand (Barth, 2017) people that work in the field
- Boston is becoming home for important corporate headquarters, such as General Electric, that are moving their office in town

The growing phenomenon of "short-term settling" in the city (often for a maximum of 2 years) has caused the so-called *fast furniture problem:* given the temporary nature of the relocation, people try to furnish their apartments with cheap / low-cost items that, at the end of their stay, are difficult to resell in an already full second-hand market, and are also difficult to recycle because they are not designed with recyclability in mind. This challenge is exacerbated by the fact that furniture is the least-recycled household item: according to EPA, over 9 million tons of furniture is in landfills (EPA: United States Environmental Protection Agency, 2019): "Fast furniture" is simply aggravating such a problem.

Given this, Boston is a great testing site for any attempt to provide an alternative to the existing relocation practices.

I.2. PROBLEM BOUNDARIES

The Boston housing and relocating market is very wide and multifaceted, and thus, for the limited time of this study, the analysis is limited to students, and in particular to HBS students; HBS represents a good case-model due to the short duration of MBA programs (two years) and due to the diverse community it is made of, as it is representative of the demographics of Boston and other large US cities.

After having faced personally the relocation problem before and after HBS, it was possible to identify the systemic challenges that the current inefficient relocation process is posing:

- *It's expensive:* on top of the typical settling-in cost (e.g. furniture, grocery, etc.), non-value-add activities such hotel stays during the moving-in process and rental cars or vans for the various shopping trips quickly build-up the move-in bill.
- *It's uncomfortable*: while the most typical example of lack of comfort is the need of building a bed after a day of Ikea shopping, there are other sources of students' discomfort, such as the need for coordinating all the activities with move-in bureaucratic process (e.g. ID collection, school registration, etc.), the lack of knowledge of the area and of the services available and the frequent lack of support by institutions.
- *It's inefficient*: the relocation process is time consuming and often plays out in similar ways for a large number of students.
- *It generates waste*: waste happens at all the steps of the process - waste of time, waste of material (furniture when moving out, fuel when making multiple trips when resources could be pooled, trash hardly recycled and differentiated in the hectic move-in days, etc.).

This capstone project maps the development of a service designed to tackle most of these challenges.

I.3. THE CONCEPT

While the full description of the service provided and its underlying business model will be extensively covered in the next chapters, the fundamental idea at the core of the service is explained here in very simple terms. The service will:

- serve as an interface between the end-user (relocating student) and the goods purveyors (furniture and grocery shops, assemblers, delivery companies, local makers, etc.);
- deliver to the customers the fully supported ability to move-in to a ready-to-live apartment upon landing in a new city (with furniture, grocery, etc. already pre-settled in the student's new home);
- take advantage of the fact that relocating students are usually grouped in a limited number of buildings (e.g. campus apartments); the service will consolidate the demand of goods, which is currently very fragmented, hardly coordinated, and typically served very inefficiently and uneconomically by grocery and furniture shops, and convert it into an easier-to-manage demand pool;
- reduce the overall cost of setting-up home by transforming and consolidating the currently fragmented consumer demand, while itself profiting from a portion of this cost reduction;
- be able to incentivize the usage of providers with higher sustainability records through flexible pricing, and to promote / push the choice of well-maintained used furniture, reducing the environmental footprint of the relocation.

The long-term objective is thus to create a regulated second-hand marketplace of high-quality furniture that can be confidently purchased by incoming students and easily sold-back by the departing students. Finally, with pooled demand, the service will be able to transform the current supply chain and reduce its environmental footprint.

In order to be successful, the service will need to navigate a complex and fragmented market and translate a diverse set of consumer needs & price points into a streamlined bulk-order and

delivery system, with the goal of reducing CO_2 emissions, and to find attractive systems to incentivize the re-usage of second-hand furniture.

With this approach, the service will be able to answer the call to “Reduce, Reuse, Recycle” as promoted by the Ellen MacArthur Foundation (Ellen MacArthur Foundation, 2019): the service will help shape better habits for people in their everyday-life bringing them to consider furniture as an investment rather than a transitory item that will be waste in a couple of years.

II. Methodology

II.1. INTRODUCTION

As explained in the previous chapter, the service is envisioned as a middle player between the end-users (relocating students) and the purveyors (furniture and grocery shops, assemblers, delivery companies, local makers, etc.), supporting relocating students in the move in/move out process. In this scenario, understanding students' needs and their willingness to pay is a key step to ensure the service success.

In order to obtain these data, two types of analyses have been performed:

- A human survey has been conducted among the HBS students' population (~2000 student/year) that attended their MBA in different years.
- A study on furniture materials and on their environmental footprint has been done for the three most frequently purchased furniture items, in order to understand the best candidate material for the specific needs of the service under discussion.

The joint insights from the data gathered through these two analyses enabled the planning of a service that can be both interesting for customers and, at the same time, viable and as circular as possible.

II.2. THE HUMAN SURVEY

The human survey consisted of thirty-one questions aimed at answering the following:

- What would be helpful for students when they arrive in Boston for studying?
- What activities are bothersome for students in the settling in/out process?

- What activities will students be happy to delegate?
- What relocating habits have a high environmental impact?
- What level of circularity can be added to the system?

The human survey is structured in four different parts: preliminary information, settling-in process, settling-out process and overall summary on specifics move in and move out choices.

- The goal of the "preliminary information" section is to get knowledge on students' age range (when they were enrolled in the MBA program) and on their presence in Boston, in order to understand their habits and their links to their stage in life when they joined HBS.
- The settling-in process survey section is composed by two different subparts:
    - Move-in transition, aimed at gathering info on what accommodations students chose when they arrived in Boston waiting to furnish their apartments.
    - Moving-in furniture choices, aimed at understanding students' habits in buying furniture.
- The settling out process, focuses on students' end-of-MBA decisions with respect to the furniture that they bought when they started the MBA
- The overall summary is focused on the different furniture items that students bought and on the initial appeal (a sort of interest-test) of the service under consideration.

II.3. MATERIAL STUDY

In Boston, the majority of the accommodations available for rent are unfurnished with already built-in kitchen, bathroom and closets. Thus, the minimum amount of furniture that students have to buy to make their apartment livable is the bed, a table / desk and some chairs.

A material study of these three items is important to understand their footprint and, consequentially, the impact (handprint) that the service could have in the market by keeping "products and material in use" as the fundamental principle that the circular economy approach suggests (Ellen MacArthur Foundation, 2019).

- *For students who want new furniture*, the service provides the possibility to purchase or lease it with the open possibility to buy it from the service if the customer wants to bring it to the next destination. Furniture is not something that has to be used and then discarded, but it's considered as an item to pass to the next step in life (and here is where the back-end service would become "awareness" service as well). In order to achieve this goal, the essential factor is the availability of high-quality furniture that can last longer and that can be remade/refurbished in an easier way than today.
- For students who want re-made/refurbished furniture the options are the same: they can buy or lease it. But by intercepting the decision-making process and by acting as back-end middle player, the service can take onboard the capability of proposing and delivering high-quality furniture at a reasonable price thanks to 2nd and 3rd usage cycles: the high-quality

property guaranties that furniture pieces are as good as durable as new, allowing those pieces items to circulate longer.

On that topic, improving the perception of remanufactured items is essential to develop the service and to respond to the environmental goal of “use less”, “own less”, “share more”. In fact, “a substantial proportion of the population associates the term ‘remanufactured’ with the risk of quality loss. Building confidence in the term and the quality assessments, testing, and warranties” (Lavery, 2013) will fuel the use of refurbished/remade items preventing furniture to be land-filled.

III. Results and discussion

III.1. THE HUMAN SURVEY RESULTS

The data obtained throughout the human survey (23 surveys answered) confirm some hypotheses such as the temporary settlement in Boston for HBS students, the difficulty to manage the furniture at the end of the MBA; at the same time, it also highlights some new aspects about students' preferences in the moving-in and moving-out stage. While the total number of surveys is not that high, the demographic representation is quite wide (16 countries, with even representation of family size, age and education, and variety of relocation choices), allowing good confidence in the reliability of the data.

The data show that:

- SETTLEMENT (Figure 9): 92% of students relocated to study at HBS and 92% of them left the country after the end of the MBA confirming that the HBS students' population in Boston is temporary.
- STUDENTS' AGE RANGE (Figure 9): 13% of the respondents are between 20-24 years old, 57% of students are between 25-29 years old, 30% are between 30-34 years old and nobody is older than 35 years old. However, even if the widest service's target seems to be represented by young adults (25-29 years old), their willingness to pay for commodity services is not very high: in fact, only 15% of students decided to choose a temporary accommodation when they landed in Boston, and those who did spent less than $50 per

night and stayed just for one night. The same approach is found among younger students: this indicates that the broader group, from a population-size perspective, is not the best target for the service under consideration due to the limited willingness to invest in furniture / relocation.

The best target for the service consideration, on the contrary, is the students group between 30-34 years-old, that have more budget to allocate in commodities, maybe due to the fact that they have longer previous job experiences, and that are often moving across the country with a partner or a family. In fact, 55% of student in this age range decided to stay in a temporary accommodation for more that 3 days spending between $100- $200 per night.

- APARTMENT CONDITIONS (Figure 9): 83% of the student's apartments are unfurnished, and additionally, even in the furnished apartments, students had to buy a lot of complementary items such as mattress topper, kitchen gear, linen and others house accessories. Thus, MBA students are generating a big market that has the potential to be more sustainable, circular and greener.
- FURNITURE TYPE (Figure 10): 57% of the students decided to buy new furniture, 43% also carried it from previous places and only 33% had second hand-furniture. Although this approach to furniture is spread towards all the age ranges, the budget that students allocated to buy furniture is very different. Students younger than 30 years old spent in average $1000-$1500 while older students spent $3000 with peaks of $5000. This is an additional data point to support the idea that the best target are students over than 30 years old.

- WHY NEW FURNITURE? (Figure 10) The three main reasons that drove students to buy new furniture are:
    - the opportunity for more design options (91%),
    - the preference to avoid used items (50%), and
    - the desire to bring the furniture with them to their new city (50%).

  At the same time, the need for economical (57%) and logistic (38%) convenience drove students to choose major furniture stores as their suppliers, such as Ikea and Jordan's Furniture (38%) or well-known website such as Wayfair or Amazon (24%), in an effort to find the right balance between convenience and beauty (20%). These data underscore the needs for personalization and durability: if students are able to buy quality furniture that meets their taste, they want to bring it to their next destination after the MBA. However, the gap in knowledge that students have of the city they relocate to and of their local suppliers can be an obstacle even for students willing to avoid fast furniture, that in many cases end-up buying in international chain-stores (vast majority of the sampled population, in fact, bought their furniture at stores such Ikea, Jordan's Furniture, etc.).

  This lack of awareness and knowledge can be converted into an opportunity for the service under consideration, since by providing consulting services during the move-in phase, it can overcome the knowledge gap and offer different supplier's options, coordinate the delivery and the apartment's set up (turn-key system).
- WHY SECOND-HAND FURNITURE? (Figure 10) The three main reasons that drove students to buy second-hand furniture are:
    - the willingness not to buy new furniture for a temporary accommodation (42%)

- the limited budget available (29%)
- the certainty of the source (29%): in fact, while the majority of students who bought second-hand items did it from friends (43%); only 28% of used sites such as eBay or Craigslist.

Thus, second-hand furniture seems to be a forced choice just for tight budget students. Furthermore, the lack of quality seems not to attract students with more buying power, almost always causing low-quality furniture to be resold / thrown away due to intrinsic low value, unworthy of being carried to the next destination.

Interestingly, but unfortunately not surprisingly, just 15% of students choose second-hand furniture in order to minimize their environmental impact: thus, sustainability is not a decision driver.

- WHY NOT RENTED FURNITURE? Nobody considered renting furniture due to three main reasons:
    - the lack of information (40%)
    - the economical perception of a very expensive option (15%)
    - the willingness to bring the furniture with them in the future (15%).

In fact, 53% of students declared to be open to using a rental service if it were available and easy to reach, and 43% said to be open to at least considering the option. This means that the rental option requires a buy-back option at the end of the lease to be appealing and capture students who want to decide to bring the furniture with them in the future (15%).

- FURNITURE FUTURE (Figure 11): 57% of students declared a willingness to bring the furniture with them (but in many cases didn't end up doing it for real), 43% of students

gave it away for free due to the low reselling gain and just 24% of students decided to resell it. The students who decided to resell or give their furniture away for free decided to do it because the furniture value was so low that was not worthy to move it.

Again, if good quality furniture is bought, less low value furniture will flow into an already saturated market: a similar shift could be a weapon to fighting the growing fast-furniture approach.

- RESELLING PROCESS (Figure 11): students perceive this stage as a bothering activity (66%) and they declare to agree to waive up to 50% of the reselling gain for an easier process. This is a key finding of the survey: the biggest value proposition of the service under consideration should be an hassle-free turn-key offering: if students were relieved from the burden of "buying and selling", they'd be willing to pay for an external provider, if deemed price competitive.
- MOVE IN PURCHASES: As shown in Figure 1, the second-hand market is not so strong compared to the new furniture market. These data confirm that if the students' budget is high enough, students prefer to buy new items.

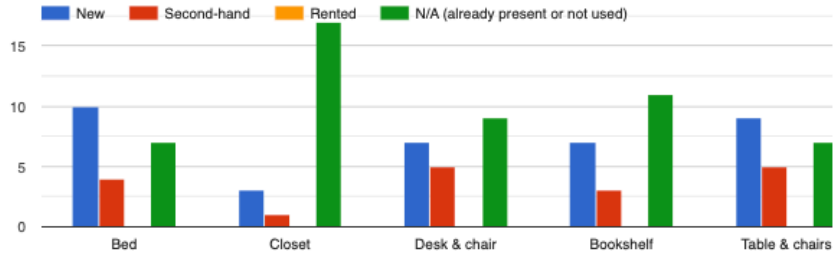

Figure 1: Move-in purchased items

- MOVE OUT RE-SELL: As shown in Figure 2, the data confirm that students become attached to their furniture if it is of good quality, and that they want to carry it with them in the future. Moreover, as anticipated above, the reselling process is so annoying for the students, and the potential gain from the selling the furniture is so low, that they prefer to give it away for free, rather than even attempting to re-sell it.

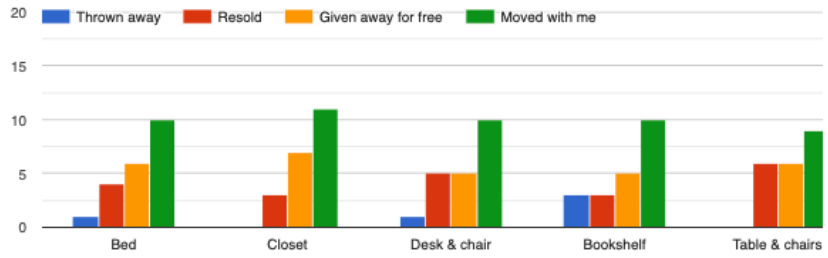

Figure 2: Move-out approach to furniture

- HELP IN THE SETTLING-IN AND MOVING-OUT PROCESS: The majority of the students declare to be interested in help in the settling-in (58%) and move-out (71%) process in particular with the activities shown in Figure 3 and Figure 4. This relates to the previous comment: if students were relieved from the burden of "buying and selling", they'd be willing to pay for an external provider, if deemed price competitive.

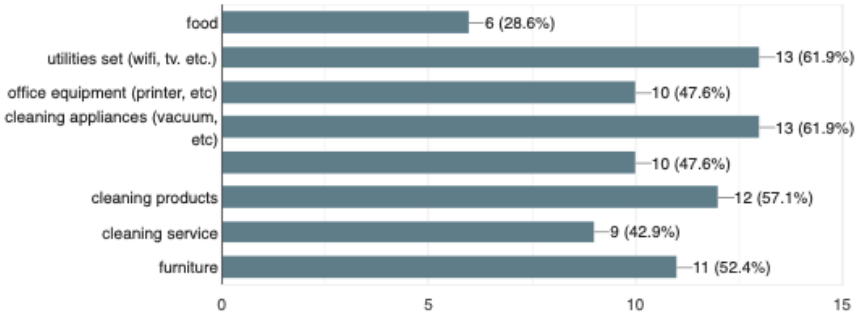

Figure 3: Activity of interest in the settling-in phase (multiple answer possible)

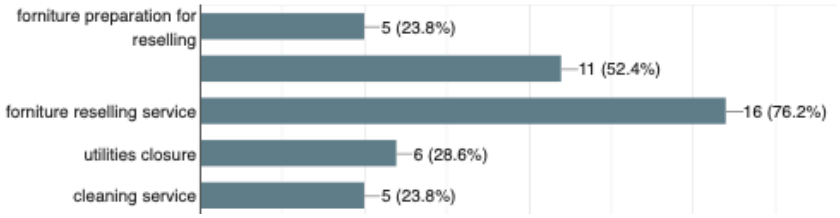

Figure 4: Activity of interest in the move-out phase (multiple answer possible)

III.2. KEY FINDINGS FROM THE HUMAN SURVEY

The data obtained throughout the human survey underscore that the service's target is MBA students 30-34 years old with an average budget for temporary accommodation furniture that is around $3,000-$5,000. Students' highest interest is in new quality furniture more than second-hand furniture due to the willingness to bring items towards the next destination. Moreover, students' lack of knowledge of their destination city (Boston) and their local suppliers drives them to buy in international chain stores, missing opportunities availed by local market or greener suppliers. The service's ability to identify optimal sellers with whom to define special purchase options, and the chance to organize bulk deliveries, can help students to overcome this knowledge gap.

Additionally, the interest in renting furniture opens a new opportunity for the service under design, as it could offer a leasing option with the option to buy-back the items at the end of the MBA experience if students loved them.

Furthermore, the survey reveals that furniture is just one aspect that students are interested in, as they are also attracted to the option to delegate commodities and utilities support. This is a new aspect that the service can consider as an add-on to the possible options: the ability to provide a comprehensive relocation support (and not only of furniture procurement) can become one of the key value propositions of the service, and can be used as a marketing tool to promote its adoption.

III.3. THE MATERIAL STUDY

Figure 1 above identifies the three items students buy more frequently are the bed, the desk/table and the chair. In order to understand the magnitude of the service's environmental impact, it is important to understand the amount of avoidable CO_2 possible by keeping these three items recirculating without buying new ones every time.

However, as easily understandable, the amount of CO_2 changes substantially depending on the material comprising these items. Other aspects affect the overall sustainability score as well: if students want to buy or to rent longer-lasting quality furniture, durability becomes a key aspect for both the students and the service; students want to bring good items with them to their next destinations, and any consideration of furniture rentals requires sturdy furniture and low maintenance during the cycle. Other key aspects that influence the furniture management and that are relevant from the sustainability point of view are weight, lifespan, recyclability, design and maintenance needs.

The materials analysis considers the production phase of the raw materials and then the main manufacturing processes of the finished goods[2]. The analysis analyzed a variety of metrics to compare different types of furniture materials and their score in many environment-related aspects: the overall findings are shown in Table 1.

[2] For metal, manufacturing processes include a typical amount of casting, stamping / laminating and machining. For plastic, it included injection molding and extrusion. For wood, no shaping processes were included as they are often much less intensive than the ones for metals and polymers. No additional analyses of other manufacturing processes were done, since parameters vary substantially depending on the methodology used for production, and the additional level of detail would not have led to a more accurate aggregated value.

		RAW MATERIAL PRODUCTION			MANUFACTURING OF FINISHED GOODS		OTHER CONSIDERATIONS			
	MATERIALS	Embedded energy	Carbon footprint for primary production	Water usage	Energy used	Carbon emission	Weight (average)	Lifespan	Recyclability	Mainteinanc need
		MJ/Kg	Kg of CO_2/Kg	L/Kg	MJ/Kg	Kg CO_2eq/Kg	Kg/m3	years	%	
METALS	Aluminium	210+- 10	12	495<>1490	8<>60 (casting <> vapor phase method)	0.4<>3 (casting <> vapor phase method)	2699	60	75	low
	Reycled Aluminium (41-45%)	26.7	2.1							
	Stainless steel	81<>88	5	112-336			7850	60	80	low
	Recycled stainless steel (35-40%)	11<>13	0.73							
POLYMERS	High density polyethylene (HDPE)	100<>110	3.4<>3.7	166<>183	3<>27 (Extrusion <> Molding)	0.2<>1.4 (Extrusion <> Molding)	960	10<>20	20	medium
	Recycled High density polyethylene	26.2	0.9<>1							
	Policarbonate (PC)	103<>114	5.7<>6.3	142-425			1200	10<>20		
	Recycled Polycarbonate	38<>47	2.3<>2.8							
WOOD	hardwood	9.8<>10.9	0.8<>0.94	500<>750			730	10<>15	5	medium
	Plywood	13<>16	0.8<>0.9	500-1000			600	5<>10		

Table 1: Material analysis of furniture elements (multiple data sources, see footnote)[3]

As underlined in the previous paragraphs and as also described in (Yuksel & Kilic, 2015), the durability and quality of the furniture are key aspects for the student and for the service that want to be ambassador against the fast furniture approach: using metals products can answer to these requirements. In fact, metal products can last longer, require less maintenance and can be disassembled and reassembled more easily. At the same time, their weight is higher and the transportation to their next destination can be less environmentally friendly and needs further study. Finally, their embedded energy and the carbon footprint are higher than polymers and wood

[3] Data on raw material production and on manufacturing processes gathered from (EPA: United States Environmental Protection Agency, 2019), (Cushman-Roisin & Tanaka Cremonini, 2019) and (Yuksel & Kilic, 2015). Data on other considerations gathered from (CEP - Civil Engineering Portal, 2019), (Plastic Europe - Association of Plastics Manufacturers, 2018) and (Barth, 2017)

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furniture, but the durability of the items spreads this pollution thought more years, hence lowering the overall impact.

One final important aspect to take in consideration is to avoid mixed material furniture where the different parts are not designed to be separated for recyclability and where non-recoverable materials are used (Yuksel & Kilic, 2015).

IV. The outcome of the analyses: service design

IV.1. VALUE PROPOSITION AND OPERATING MODEL

Based on the finding form the human surveys, the proposed service will be multi-stakeholder; the main focus will be the furniture aspect of the relocation, which is the section creating most of the process waste, but, as seen in the human-survey section, a turn-key capability which includes other types of support would be a very valuable add-on to increment the service's appeal and hence increase its reach. Since the survey data indicated that sustainability is not a decision-making driver for students, no premium can be charged to relocating students for any sustainability enhancement, which must therefore be achieved simply as a by-product of the designed operating model. For the same reason, it is evident that any "green" brand advertising would not be considered a differentiator for the target students, and should not be leveraged in advertisements and/or media outreach.

The approach to address process wastes is a full redesign of the relocation process, whereby the proposed service acts as middle player, consolidator and coordinator with respect to resolving the fragmented demand of relocating students. The service will offer a use-for-fee consultancy in its early phases (which, while fully optional, might be helpful as a "hook" to capture new potential users); it will offer operational support and supply-chain ownership, and through this ownership it will attempt to reduce the footprint of the process, respectively helping incoming students in the three phases of their journey (a graphical representation of the service is shown in Figure 5) :

- Pre-relocation - IDEATION: The Service will start helping relocating students by understanding their needs (e.g. visiting their apartments before arrival, identifying the "must-have" items, helping them "choose" furniture, hence trying to shift the purchases to lower-footprint suppliers). Even if such offerings will not be selected by many students, to the few that will choose this option the Service will be able to provide an *influencing factor* in the decision-making process, ideally swinging those students towards suppliers of higher-quality furniture (hence feeding the 2nd hand market controlled by the service itself) and even providing the option of leasing / buying of re-furbished furniture elements.
- Relocation – OPERATIONAL SUPPORT: this phase is the one where the Service under design will play the lion's share of the support to the student and, by playing in the back-end of the process, will try to achieve the highest handprint possible. The support during this phase will consist in a variety of touchpoints in the customer journey, and during those touchpoints circularity will be enhanced:
    - The service, either with the front-end consulting offering described above or without it, will connect with customers and gather their needs / demands for settling-in process (e.g. pieces of furniture, etc.) and will then propose a solution for a furniture portfolio driven by the various sustainable avenues of furniture provision. At the moment of writing, and based on the analyses described in the methodology section, the author is considering the following avenues:

- the management of a 2nd hand furniture inventory composed of mid-to-high quality furniture elements, with long life and low footprint, made price-accessible through the usage of re-furbished elements and/or lease options.
- the direct access, for new furniture elements, to local suppliers with lower environmental footprint, that due to their local nature might not have the visibility required to fall in the radar of the flock of relocating students moving either from abroad or from out-of-town.
- element of industrial chains but marked up to absorb the higher delivery fees and the "turn-key" service offering. This would allow both higher revenues for the service, but also would hopefully shift the decision towards local, more affordable suppliers

- After having gathered demand for a critical mass of students, the Service will coordinate the procurement and assembly of the required pieces of material, but will leverage bulk-orders and/or consolidated shipment (rather than fragmented one-by-one shipments) to be delivered on campus before students' arrival. This would allow a hassle-free system for the relocating students, which would then have their home ready upon arrival.

  To support this phase, mastering the supply chain will be the critical step, both in terms of shipment agreements with suppliers but also in terms of coordinating the assembly of the furniture leveraging local workforce. In this sense, the capability of offering a bulk "contract" for multiple

customers will allow better negotiation position with suppliers in return of solid predictable demand for them (a win-win situation). This is the fundamental premise of a "Demand-pooling" solution: the capability of pooling all the customers' requests into few orders will optimize the supply chain and, at the same time, reduce its footprint.

All of this will be "behind the scenes": in advance of their arrival, students will only thing see a final picture of their "home".

- Move-out – DISPOSAL / MOVING HELP: The hassle-free service provided during the move-in process MUST continue in the move-out steps. This is a key requirement for two reasons:
    - The Service must be able to recuperate the high-quality, high-durability furniture that is suggested during the earlier phases to be able to offer it in a cost-effective way (continuously buying new high-quality furniture is not a viable economic option), and cannot afford having those pieces of furniture hitting the normal 2nd hand market in an uncontrolled way.
    - The Service must be able to feed its move-in offering with its move-out furniture collection; in this sense, the move-out support is the main furniture procurement channel that the Service will leverage.
    - The Service must be able to monitor the furniture movements if it wants to have intelligence of its handprint, which is likely one of the key metrics

needed to get access to public grants and funding for low-footprint offerings.

In order to provide the much-needed (and market-hook) hassle-free support across the move-out step, the service will need to provide departing students with turn-key, all-inclusive support including visits to evaluate the status of the furniture, hassle-free buy-back services by representing an interested buyer at slightly-above-market rates, and handling all the operational steps of customer's sales of the furniture (e.g. furniture disassembly and pick-up). For full turn-key capabilities, this service will eventually be coupled with other minor aspects (e.g. cleaning).

Finally, the benefits of pooled demand described in the move-in process will remain in the move-out process as well, since the furniture will be collected and hosted in a local warehouse by a single entity (the service itself), while ancillary services (e.g. furniture disassembly, cleaning, etc.) will be handled by a single provider benefitting from a consolidated demand.

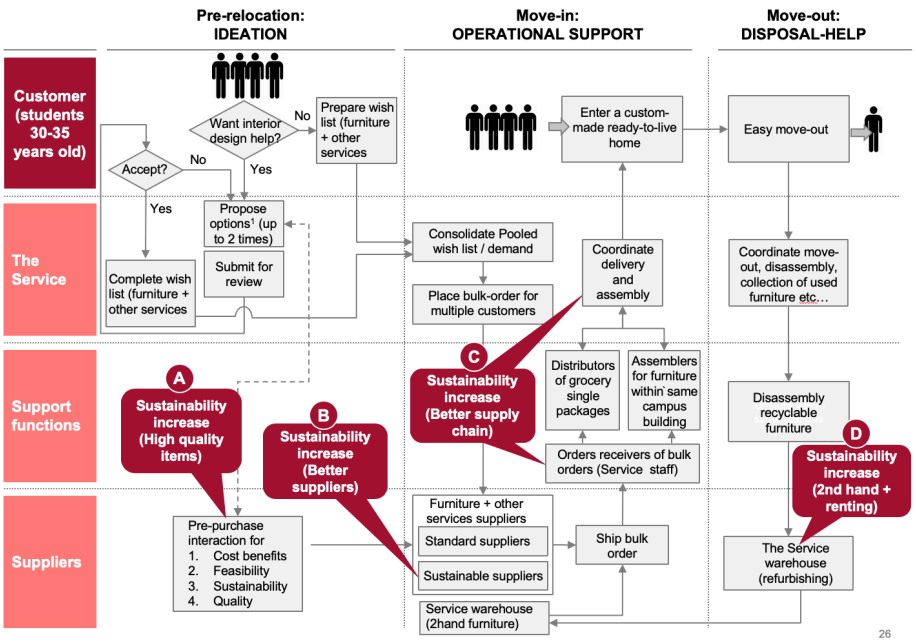

Figure 5: Service value proposition and operating model

IV.2. BUSINESS MODEL

The Service will generate revenues and profits by capturing portion of the economic value unlocked by the relocation support service:

- *Reduction of customer expenses:* For the target market under consideration (summarized in the chapter II) the service can capture the value that is currently being

"wasted" in the relocating process: specifically, the availability of a turn-key offerings will eliminate hotel nights, rental car fees, trips to stores, delivery fees, etc. incurred by students when they land in the city. For the market under consideration, even just the hotel nights expenditures (three nights) were a non-negligible expense that the service could tap on.

- *Consolidation of service fee:* as described earlier, while each student either visits IKEA to purchase furniture, rents a van to bring it home, or has the furniture delivered at home, the Service under consideration would be able to consolidate the demand, pool deliveries and extract value from customers. Even assuming a conservative proxy of ~$150/customer per delivery, amassing 10 non-negligible deliveries would reduce the total cost of the deliveries by 90% (1 bulk delivery rather than 10 separate ones): the service will then charge customer a delivery cost lower than the original 150$, leading to a win-win situation (the service, by earning revenues; the customers, by reducing their relocating costs)
- *Furniture sales controlled pricing:* as in chapter III, customers are already foregoing substantial revenues by almost selling their furniture for free simply to avoid the hassle of the selling process in a period when their heads and hearts are already projected to the next life-phase. The Service can tap into this opportunity by providing turn-key move-out services in charge of limited re-purchase fees (or even with renting fees) for the furniture used by moving-out students. A re-purchases price for ~30% (which is what students seemed to be willing to accept when they didn't give it away for free)

can allow significant mark-ups when the same furniture is offered to incoming students at approximately 70% of the original price.

The main unknown element of the full business case is how much cash and profit will be tied in the management of a lean warehouse that "hosts" the re-used furniture between move-out and move-in, while retaining the furniture not purchased by the customers. While there are economically convenient warehousing options outside of Boston, at the time of writing the analysis of those costs had not been completed. This will be a vital further step needed to thoroughly test the viability of the full business model. Nonetheless, as the warehousing is the main cost element not directly absorbed by the customer, prospects for the full business model appear viable.

As a final consideration, specific attention should be given to the high-seasonality of the business (which is concentrated in the move-in and move-out season of the program): cash flow projections will need to be prepared in advance to ensure sustainability despite wide fluxes in demand, activity, and expenses. However, this high variability may be offset by the option of "renting" furniture, which is expected to provide sufficiently steady cash-flow to continue operations during non-peak seasons.

IV.3. SUSTAINABILITY INCREASE AND CIRCULARITY ENHANCEMENTS

As discovered through the survey, sustainability is not a driver in students' choices, and has therefore to be embedded in the service structure and offers, without being a "value proposition" for the students.

The designed service, as described in the operating model section of this paper, is achieving this objective by embedding the increased sustainability and the increased circularity in its back-end process, without altering customer choices; in fact, with a well-integrated system, it even provides additional value to the customer and leverages the enablers of such value to drive circularity.

As shown in Figure 5, there are four key areas where the designed service increases the sustainability and the circularity of the relocation process:

A. High quality furniture: The service will be able to provide high quality options that allow students to keep the furniture in their journeys to different destination without having a quality degradation. Also, the service will leverage such higher quality to drive more frequent re-use, hence reducing the overall footprint of the process
B. Increase usage of sustainable suppliers: during the ideation phase the service will offer different options to the customers, in an effort to find the right balance between sustainability and customer needs, but always focusing on sustainable suppliers. By consolidating demand, the service will be able to allow higher-than-normal demand for local and environmentally conscious suppliers, hence providing a win-win situation which could unlock economic and environmental benefits.
C. Optimized supply chain: during the relocation phase The Service will consolidate demands and deliveries and reduce trips to different suppliers, hence de-facto significantly reducing the “transportation” waste of the current relocating process.

D. Higher usage of second-hand and re-furbished furniture elements: by becoming a turn-key offering for the move-out process, the Service will increase second-hand furniture usage simply through its existence, as it will procure second-hand furniture during the move-out support and will use it for the settling-in phase of new students. The usage of high-quality furniture described in "Point A" will enable longer life for the furniture itself and will therefore intrinsically enable a bigger second-hand market.

IV.4. ANALYSIS OF POTENTIAL COMPETITORS

The service's offer is a new business model that aims to change the business-as-usual relocation trends; in order to design the best service possible is important to learn from the past and observe the present, to understand what services are already present in the market and what are their weaknesses and strong aspects.

A. In London, ***The Ripe Office*** is offering a renting service for office's furniture with the buy/renting buy back options designed following the circular economy principles. The office landscape allows to have more standard options for different clients and an easier supply chain compared to houses where the personalization is a key factor. However, the principles of circular economy have to be the pillar for the Service that wants to disrupt a market based on the fast furniture concept.

B. The ***Furnishare*** platform is an option to recirculate undesired furniture and to allow owners to profit from it. In fact, the owners can upload their items in the platform, and when somebody rents it, for a limited time the owner can gain part of the leasing before losing the property of the item.

C. ***Arcadia design*** is an Italian design office that allows clients to add single elements of furniture with the goal of transforming their purchase over time, based on the different needs of their life stage. The transformation aspect is a key for the sustainability aspect targeted by the service proposed here.

D. ***Campus Doorman*** was an HBS start-up also seeking to disrupt the relocation business. This service is now out of business now, mostly due to the lack of personalization in their offer that, contrary to the proposed service, was based on pre-set options for bedrooms and living rooms.

V. CONCLUSIONS AND RECOMMENDATIONS

V.1. SUMMARY

The project described in this paper is intended to reduce the current highly unsustainable and non-circular relocating process for students and workers moving in-and-out of Boston for a limited time. The broader goal involves minimizing the "fast furniture" phenomenon.

It can be concluded that there is an opportunity for the service to be effective, and that implementation plans should start in parallel with refining the business model.

The main characteristics of the service designed during this study are listed below.

1) TARGET MARKET: In the pilot phase the service market will be MBA 30-35 years old students with an available relocating budget of $5000 average. Subsequently, the potential market will also include executive students or workers that are moving for a temporary time with a higher potential budget thanks to their frequent moving agreements sponsored by their companies.
2) LOCATION: The Pilot phase will be in Boston with the option of expanding the business in all the metropolitan cities that have a high attractiveness for students and workers. For example, San Francisco is a hub for University and Tech industries and New York is a hub for Finance and university as well.
3) CONCEPT: the service will offer relocation assistance delivering a *turn-key* home ready to live in. It will achieve these *turn-key* capabilities by supporting the relocating students across all the key steps of the relocation process, and by embedding sustainable choices

into the process, it will achieve higher circularity and higher sustainability as a by-product of the offered service:

a. *Pre-move-in*: the service will support students in the furniture choice for their apartment *before* their arrival in-town. Such interaction will be able to partially influence students' choices towards local suppliers with lower footprint, towards in-house-managed high-quality second-hand furniture, available for sale or for lease;
b. *Move-in:* the service will consolidate marked demand from multiple students and improve the last steps of the furniture delivery's supply chain. Through such consolidation, the service will set-up the new apartment of the incoming students *before* their arrival in-town, hence providing an alternative to the current inefficient and expensive process of hotel-stays, frequent travel to furniture shops, etc.;
c. *Move-out:* the service will support students by providing a "known" channel for furniture re-sell that will take care of furniture disassembly and pick-up, hence reducing the stress in a phase when students are ready to start their new chapter in life and when they don't want to deal with the stress of moving out. Through such support, the service will gain access to a sizeable second-hand market (technically, it would be almost its "creator") and gain ownership of higher-quality elements for re-sale or re-lease.

The fact that the increased sustainability will be achieved as by-product of a service designed to address student's need of hassle-free relocation, rather than as the main advertised value, is the critical enabler of its potential for success. In fact, since students

do not value sustainability as a decision-driver, any attempt to push sustainability only as a marketed value would not earn enough interest for meaningful impact; but by advertising a "simple" move-in/move-out solution, and by designing the supply chain to be more circular, the two aspects will be mutually reinforcing.

4) NEXT STEPS: The main next steps are the refinement of the business model, with accurate P&L and Cash-flow creation, and the launch of the operational implementation of the designed supply chain, through the initial outreach to possible suppliers and through more detailed considerations of the inventory needs and warehousing options. All of these are planned for the early months of 2020, in order to target the relocation of the Class of 2022.

V.2. ENVOI

I'm formally an Italian Architectural Engineer with a strong belief in sustainable living. On one hand, architects have the responsibility to deliver green projects that are designed to be sustainable from the ideation phase towards the realization/ usage phase to the end of life moment, on the other hand every person has the responsibility to be green as possible in their everyday life. I truly believe that every person can make a difference in addressing the climate change problem but being more thoughtful in the waste production and in product consumption in accordance to the lifestyle and personal talent without detrimental effects on their choices.

I hope this Service can help to create handprint in a field where fast furniture is spreading and, at the same time, can teach people how to have better habits in their everyday life.

Appendix I

'The climate change' topic has recently become very popular, present almost daily in the media outlets across the globe, either in news reports describing the risk faced by our planet, or in media articles attempting to deny its seriousness.

This type of public attention, by itself, is not new: in other occasions public opinion has already focused heavily on specific topics (noticeable examples are the public focus on nuclear energy reduction after the Chernobyl or Three Mile Island accidents, or the public outcry after the Deepwater Horizon oil spill, when public opinion voiced the desire to reduce off-shore drilling). In some cases, the result of such a public focus was material: some countries stopped the development of nuclear plants or banned offshore drilling (my home country Italy is an example for both cases). But similar results could be achieved because, in many cases, countries' who chose to stop using nuclear energy (or offshore drilling) were not affected by their peers across the globe who eventually chose otherwise.

In case of climate change, this is no longer true: in order to be solved, climate change certainly demands *global* effort, as decision taken in Asia affect the Americas and vice-versa, and given the sheer magnitude of the problem, big decisions at countries levels might not be enough, leading to the need for *individual* efforts[4]. In this sense, all media focus on climate change over the last few years is a critical first step, but immediately poses a fundamental question: are people really ready to make changes to guarantee a better future for the Earth as they often preach in public?

[4] Just to give an example, even if in the best scenario The Clean Ocean project might be able to eliminate the plastic in the Great Pacific Garbage Patch, only individual behavioral changes in the plastic disposal could sustain the results.

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From a scientific standpoint, the case is clear[5]: advanced technologies let scientists delineate a more precise planet condition, and more and more data are supporting the conclusion that the Earth climate is deteriorating faster than originally predicted, with an increasing risk of getting to a point-of-no-return where even major efforts from the global community might not be able to revert the ongoing trends: since the 19th century, "the planet's average surface temperature has risen about 1.62 degrees Fahrenheit (Figure 6)…most of the warming occurred in the last 35 years, with the five warmest years on record taking place since 2010". Most of this increased heat is absorbed by the water: oceans are rising in level ("8 inches in the last century") and glaciers are losing mass. "Antarctica lost about 127 billion tons of ice per year between 1993 and 2016" with a three-time faster rate in the last decade and recent recision (60 cm/ day) of Mont Blanc's glacier, that endanger people and environment (BBC, 2019). Moreover, drought events or intense rainfall episodes are increasing in number, and the acidification of oceans and consequent eutrophication are reaching dangerous level due to human-caused atmospheric CO_2 release.

But from the public consensus on how to react and on what to do, the situation is much more complex:

- The recent "Strike for the climate" (New York Times, 2019), including Greta Thunberg's movement, brought thousands of students on the streets all over the world with the goal of raising governments and nations' awareness on the condition of the planet (Figure 7) and asking for action

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[5] The percentage of the scientific community that still denies the human attribution of the climate change phenomenon is minimal and shrinking.

- The Circular-economy approach and philosophy (as disseminated by Ellen MacArthur) is gaining traction among businesses and countries, even earning a permanent influencing seat in the UN Industrial Development Organization.
- However, despite the criticality of the circular economy and sustainability concepts, associated popular knowledge is only nominal. While very city is surrounded by visual inputs about the sustainability issue[6], the effective shift in people habits seems to be lagging. Furthermore, even among those who are paying attention, many are disinformed about how to act. Interestingly, but worryingly at the same time, despite all the efforts to significantly raise people's awareness of climate change and sustainability, a shocking survey revealed the opposite: a widespread lack of comprehension regarding the severity of the globe's environmental conditions, and the requisite actions needed future, large-scale well-being. The Eco Pulse 2018 survey (Figure 8Figure 8) highlighted that words such as *sustainable, organic, all natural* got highest [frequency] rankings, but "On the lowest end, were 'circular economy' and 'cradle to cradle'. [This fact] should serve as a wonderful reminder to all of us in the sustainability arena that the way we talk is not normal" (Shelton, 2019).

Looking at the Eco Pulse 2018 survey, one might even conclude that people are "greenwashed" about some very popular words such as "organic" and "natural", but they are not really informed even on such topics, otherwise they would have likely encountered information about the circular

[6] Few examples are projects to clean local riverbanks, advertisement of organic and fair-trade food, the last pair of shoes made form plastic or scary photos about a sick planet

economy. And this in turn poses the critical question: is the public focus really having the necessary effect?

Based on the author's personal experience, and based on the presented surveys and data, the answer seems "no": while the ongoing increase of public focus is positive, it will not enable enough individual shift to make a material impact on the climate change issue. But, at the same time, the author is a firm believer in the power of the big numbers: small changes occurring in the big volumes of everyone's life can and will lead to meaningful impact – the issue is how to trigger and enable these changes.

The project presented in this paper is a direct consequence of the beliefs just described: it is an attempt to modify people's behavior by providing a service which did not exist before and which:

a. reduces the overall footprint, waste content and energy consumption of a process very frequently encountered in someone's life (in this project, the relocation), hence providing a small sustainability change, but applicable to a big volume of individuals
b. tries to achieve such impact by minimizing people's behavioral shift, hence achieving wider adoption
c. aims at win-win solutions, with the "AND" approach in mind: more sustainable AND more convenient

Appendix II: Human Survey

Data research on Settling-in and Move-out habits for students relocating to Boston for a Master Degree program

Hello everyone,

thanks for clicking on the survey link!

This survey's goal is to better understand the current habits and decisions taken by Graduate students relocating in-and-out of Boston for their graduate programs. Specifically, as part of an ongoing Thesis projects, I am trying to understand the sustainability and / or the environmental impact of the HBS student population relocating every year to Boston for a short (2 years) planned stay.

Your answers, as a student or student's partner, will help better understand the current environmental impact of the process and hopefully help designing possible solutions to mitigate the issue enabling a migration towards a more circular system.

The survey consists in approximately 25 multiple choice questions, and should take ~10min for completion. This first page is only for informational purposes.

Your participation in this study is voluntary and you may withdraw your participation at any time for any reason. Your answers will be kept confidential.

Thank you in advance for your help on this effort!

Have a good day,

Elisa Doria

* Required

Preliminary information

This informations are only for statistical surveys. All your data will be confidential.

1. **What was your age when you attended HBS?**
   Mark only one oval.
   - ◯ 20-24 years old
   - ◯ 25-29 years old
   - ◯ 30-34 years old
   - ◯ 35 years old or older

2. **Did you relocated to Boston to study at HBS?** *
   Mark only one oval.
   - ◯ Yes
   - ◯ No *After the last question in this section, skip to question 32.*

3. **How long did you plan to stay in Boston?** *
   Mark only one oval.
   - ◯ 2 years
   - ◯ more than 2 years

Settling-in process - move-in transition

This section will cover your decisions and your choices when you moved to Boston.

4. **When you arrived to Boston, did you use a temporary accommodation?** *
   Mark only one oval.
   - ◯ Yes
   - ◯ No

5. **If yes, What kind of temporary solution did you choose?** *
   Mark only one oval.
   - ◯ Hotel / temporary apartments
   - ◯ Airbnb
   - ◯ Friend's house
   - ◯ Not applicable

6. **If yes, How many nights did you spend at such accommodation?** *
   Mark only one oval.
   - ◯ 1 day
   - ◯ 2 days
   - ◯ 3 days
   - ◯ More than 3 days
   - ◯ Not applicable

7. **If yes, Approximately, what was the cost of your stay, per night?** *
   Mark only one oval.
   - ◯ 0-50$
   - ◯ 50-100$
   - ◯ 100-150$
   - ◯ 150-200$
   - ◯ More than 200$
   - ◯ Not applicable

Settling-in process - furniture

This section will cover your decisions and your choices with respect to furniture, grocery and settling-in items

8. **How was your long-term accommodation for the time that you stayed in Boston? [multiple answers possible]** *
Check all that apply.

- [ ] Furnished
- [ ] Unfurnished

9. **If you chose both furnished and unfurnished, pls indicate the approximate percentage of new**

_____

10. **What type of furniture did you have? (multiple answers possible)** *
Check all that apply.

- [ ] New (bought after relocation)
- [ ] Bought 2nd-hand
- [ ] Carried with me from my previous place
- [ ] Rented

11. **Approximately, how much did you spend in total for your furniture** *
Mark only one oval.

- ◯ 500-1,000$
- ◯ 1,000-1,500$
- ◯ 1,500-2,000$
- ◯ 2,000-3,000$
- ◯ 3,000-5,000$
- ◯ 5,000$-10,000$
- ◯ More than 10,000$

12. **For the furniture you bought new, why did you choose to buy new furniture? (multiple answers possible)** *
Check all that apply.

- [ ] You prefer not to use used items
- [ ] The budget you set yourself was enough to cover all new furniture
- [ ] I wanted to be "flexible" in the design of the place
- [ ] I planned to bring my furniture with me upon leaving Boston
- [ ] Not applicable (didn't buy new furniture)
- [ ] Other: _____

13. **Where did you buy the majority of your new furniture?** *
Mark only one oval.

- ◯ Major furniture stores (Ikea, Jordan's furniture, etc.)
- ◯ Major furniture stores (higher-end, such as Room & Board, Bo-concept)
- ◯ Websites (e.g. Wayfair or similar)
- ◯ Boston local artisan shops
- ◯ Not applicable - didn't buy new furniture

14. **Why did you choose that place / retailer? (multiple answers possible)** *
Check all that apply.

- ☐ Economical convenience
- ☐ Logistic Convenience
- ☐ Quality / beauty of the merchandise
- ☐ Low environmental impact
- ☐ Not applicable - didn't buy new furniture
- ☐ Other: _____

15. **For the furniture you bought second-hand, why did you choose to buy second-hand furniture? (multiple answers possible)** *
Check all that apply.

- ☐ I preferred not to buy new furniture for a short-term (2 years) accommodation
- ☐ The budget you set yourself was not enough to cover all new furniture
- ☐ I wanted to re-use and minimize my environmental impact
- ☐ I already knew the people I'd buy the furniture from
- ☐ Not applicable - I didn't have second-hand furniture
- ☐ Other: _____

16. **Where did you buy the majority of your second-hand furniture?** *
Mark only one oval.

- ◯ Craigslist / Ebay
- ◯ Harvard Market place (including exiting students)
- ◯ Friends
- ◯ 2nd-hand markets / local shops
- ◯ Not applicable - didn't buy second-hand furniture
- ◯ Other: _____

17. **Did you consider and/or decided to rent your furniture?** *
Mark only one oval.

- ◯ Yes
- ◯ No

18. **Why?** *

_____

19. **If the option were available and easier to reach, would you consider renting your furniture?** *
Mark only one oval.

- ◯ Yes
- ◯ No
- ◯ Maybe

Moving-out process - furniture

This section will cover your decisions and your choices with respect to leaving Boston / relocating to another place.

20. **What did you do with your forniture when you had to leave Boston? (multiple answers possible)** *
Check all that apply.

- ☐ Resold them trough second hand web-site
- ☐ given away for free
- ☐ brought with you to your next destination
- ☐ Other: _____

21. **If you choose to resell all or part of your furniture, why did you take this decision? (multiple answers possible)** *
Check all that apply.

- ☐ the reselling process was easier than the moving process
- ☐ forniture's value was low and that were not worthy to be moved
- ☐ your next employer did not pay your move out of Boston
- ☐ not applicable (didn't resell it)
- ☐ Other: _____

22. **How much of the original price were you able to recover by reselling your furniture?**
Mark only one oval.

- <30%
- 30% < value < 50%
- 50% < value < 70%
- >70%
- not applicable (didn't resell it)

23. **Were you bothered by the reselling process?** *
Mark only one oval.

- yes
- no
- not applicable (didn't resell it)

24. **How much of the reselling gain would have you been ok to waive for an easier process/help?**
Mark only one oval.

- 0%
- 20%
- 50%
- 80%
- 100% (you would've agreed to give it away for free if the process is easy)
- not applicable (didn't resell it)

25. **If you choose to give all or part of your furniture away for free, why did you take this decision? (multiple answers possible)** *
Check all that apply.

- [ ] you didn't want to take care of the reselling/moving process
- [ ] your budget allowed to wave the reselling gain
- [ ] you wanted to help someone in need (singolar person, charities, associations, etc.)
- [ ] the reselling gain would have been too low to face the reselling process
- [ ] not applicable (didn't gave it away for free)
- [ ] Other: _____

26. **If you choose to bring your forniture with you to your next destination, why did you take this decision? (multiple answers possible)** *
Check all that apply.

- [ ] you were very attached to your items and you wanted to bring them with you
- [ ] your next employer paid entirely or partially your moving out of Boston
- [ ] the moving cost was more than the total amount that you spent to buy all your items
- [ ] not applicable (didn't bring it with you)
- [ ] Other: _____

Overall summary on specifics move-in and move-out choices

This section will ask you to summarize your choices when you moved in and when you moved out of Boston with specific reference to the main furniture / appliances elements present in your home

27. **Move-in purchases** *
Mark only one oval per row.

	New	Second-hand	Rented	N/A (already present or not used)
Bed	◯	◯	◯	◯
Closet	◯	◯	◯	◯
Desk & chair	◯	◯	◯	◯
Bookshelf	◯	◯	◯	◯
Table & chairs	◯	◯	◯	◯
Sofa	◯	◯	◯	◯
Lamps	◯	◯	◯	◯
TV / Audio-video appliances	◯	◯	◯	◯
Other appliances	◯	◯	◯	◯
Kitchen supplies (dishes, glasses, etc.)	◯	◯	◯	◯
Bedroom supplies (linen, etc.)	◯	◯	◯	◯

28. **Move-out re-sell** *

Mark only one oval per row.

	Thrown away	Resold	Given away for free	Moved with me
Bed				
Closet				
Desk & chair				
Bookshelf				
Table & chairs				
Sofa				
Lamps				
TV / Audio-video appliances				
Other appliances				
Kitchen supplies (dishes, glasses, etc.)				
Bedroom supplies (linen, etc.)				

29. **Would you have been interested in extenral help to facilitate your setting in-out process, if that allowed lower environmental impact? (multiple answers possible)** *

Check all that apply.

- [ ] yes (settling in)
- [ ] yes (settling out)
- [ ] no (settling in)
- [ ] no (settling out)

30. **In particular, what would have been appealing for you to find in your accommodation in the settling in phase? (multiple answers possible)** *

Check all that apply.

- [ ] food
- [ ] utilities set (wifi, tv. etc.)
- [ ] office equipment (printer, etc)
- [ ] cleaning appliances (vacuum, etc)
- [ ] kitchen appliances (mixer, coffe maker, kitchen aid, etc.)
- [ ] cleaning products
- [ ] cleaning service
- [ ] furniture
- [ ] Other: _____

31. **In particular, what would have been appealing for you to find in your moving preparation during the settling out phase? (multiple answers possible)** *
Check all that apply.

- [ ] forniture preparation for reselling
- [ ] presence of a person to coordinate the moving process
- [ ] forniture reselling service
- [ ] utilities closure
- [ ] cleaning service
- [ ] Other: _____

End of the survey

Thanks for your help.
Please click submit to record your answers.

32. **If it is ok to reach out to you in case of further questions, please leave your email here. Thanks!**

_____

FIGURES

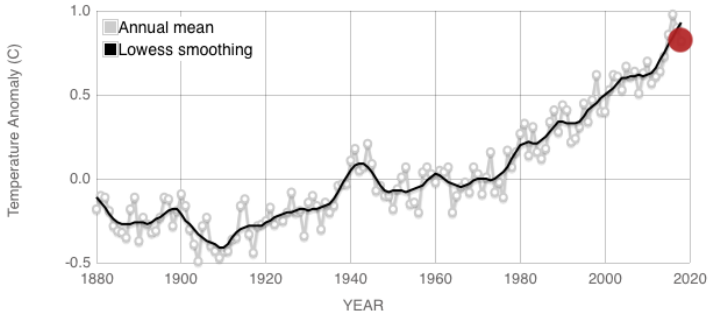

Figure 6: Global land-ocean temperature index (Data source: NASA's Goddard Institute for Space Studies (GISS). (Credit: NASA).

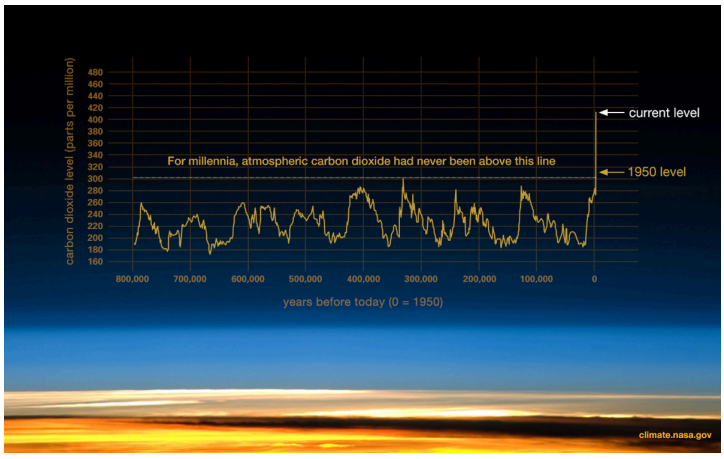

Figure 7: Atmospheric CO_2 content detected in Polar ice samples (Credit: NASA)

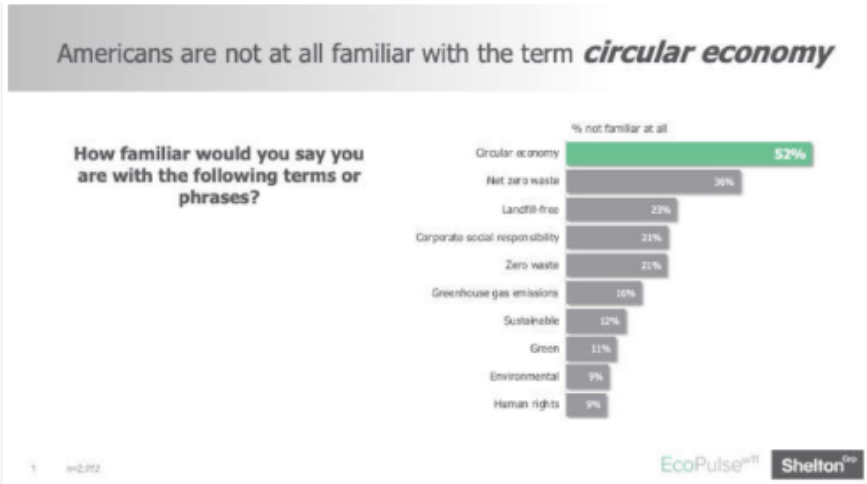

Figure 8: Knowledge about circular economy (Shelton, 2019)

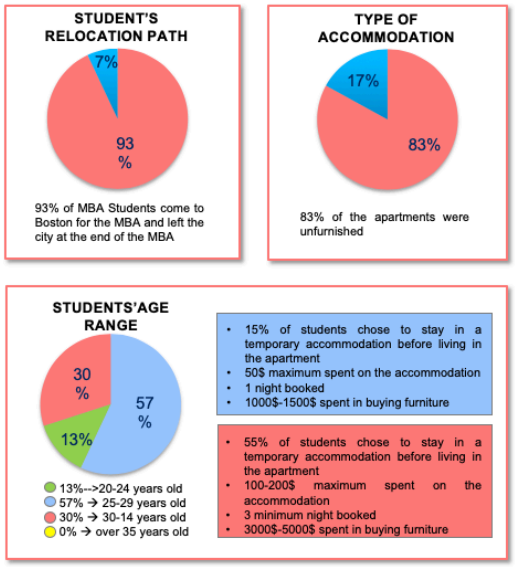

Figure 9: Survey results - Demographics and accommodation choices

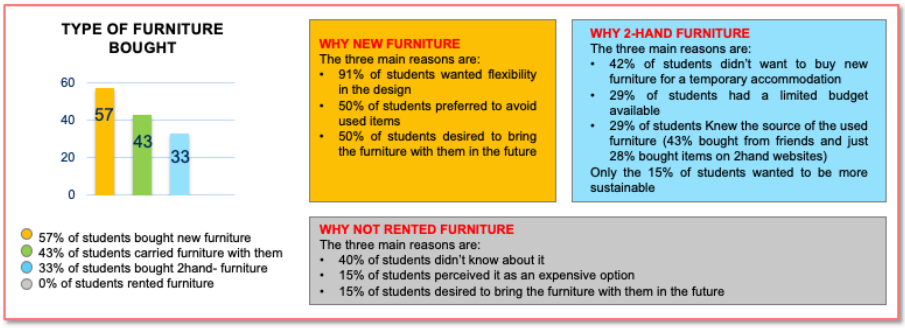

Figure 10: Survey results - Furniture purchase habits upon settling-in

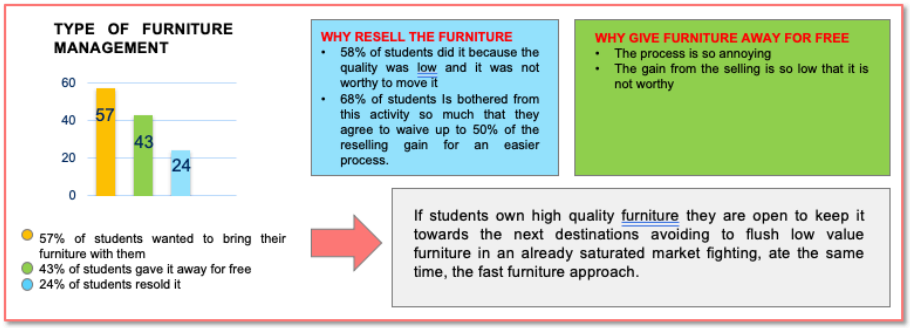

Figure 11: Survey results - Furniture re-selling habits upon moving-out

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