ENGINEERING LEADERSHIP PROFESSIONAL PROGRAMS

Title:

AirHouse : A Sustainable On-Demand Warehouse Solution

AirHouse is a web based service that connects online merchants, who need storage space, to the homeowners, who have space to offer on rent. It is a two sided marketplace designed to offer on-demand warehouse solution.

Team 5

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1. Market Need

Over the last decade, fueled by the likes of Amazon Inc, online retail has had continuous growth. During the Covid-19 pandemic e-commerce had a 19% global sales growth just for 2020 [1]. The USA alone saw an increase by $244.2 billion or 43% in 2020, rising from $571.2 billion in 2019 to $815.4 billion in 2020 [2]. It is clear that the pandemic accelerated the e-commerce adoption but it also brought to fore new issues. To be successful in this changing business landscape, one needs to understand why not every brick and mortar business has been successful in online retail (example: ToysRus). A study of online shoppers identified that 70% of such consumers will abandon the shopping cart for two reasons - shipping costs and delivery time [3]. Industry giant Amazon Inc has established the benchmarks in online retail. Fast delivery is 2 days or less and free shipping is taken for granted. Consumers will take speed and convenience over brand/trust. It is then logical that positioning goods closer to end consumers makes better delivery promises possible at lower costs. However, warehousing and distribution center growth has not scaled at the same rate as e-commerce. In Q4 2022 the USA warehouse vacancy rate was 3% which is 300 bps lower than its 10-year average of 6.5%. Due to the supply-demand imbalance the rental rates for warehouse space has been steadily increasing. In 2022 the average rents went up by 21.6% annually, while some markets recorded increases of more than 40% [4]. The situation with vacancy rates is further exacerbated by certain industries hoarding the warehouse space - renting out space more than they need anticipating cyclical business [5]. It is no wonder then that even the Amazon Inc has prioritized establishing more than 1500 neighborhood warehouses across the USA to cut down shipping/distribution costs and meet delivery time targets [6]. A mass casualty of this trouble with warehouse/distribution center s are businesses that are either small scale or have a product that does not necessarily need large square footage. Such small players are getting squeezed out of the warehouses by larger businesses that provide stable and high turnover of products. Warehouses/distribution centers prefer them because not only they provide stable leases but because the handling fees (with higher movement of products) bring in higher revenues [7]. Building new warehouse space is not easy and not always commercially viable. For example the new Amazon logistics facility in Mission Bay, SF cost Amazon $200M to buy and another at least $125M to build which will yield 650,000 square feet of storage space - that is a staggering $200 per square feet not counting cost of the land [8].

It is clear that the warehouse/distribution center space for direct to consumer industry is a problem waiting to be solved. In this paper we will present '*AirHouse'* - a 'two sided market' solution to this problem that will not just augment vacancy rates but can also sustain seasonal supply/demand cycles.

AirHouse

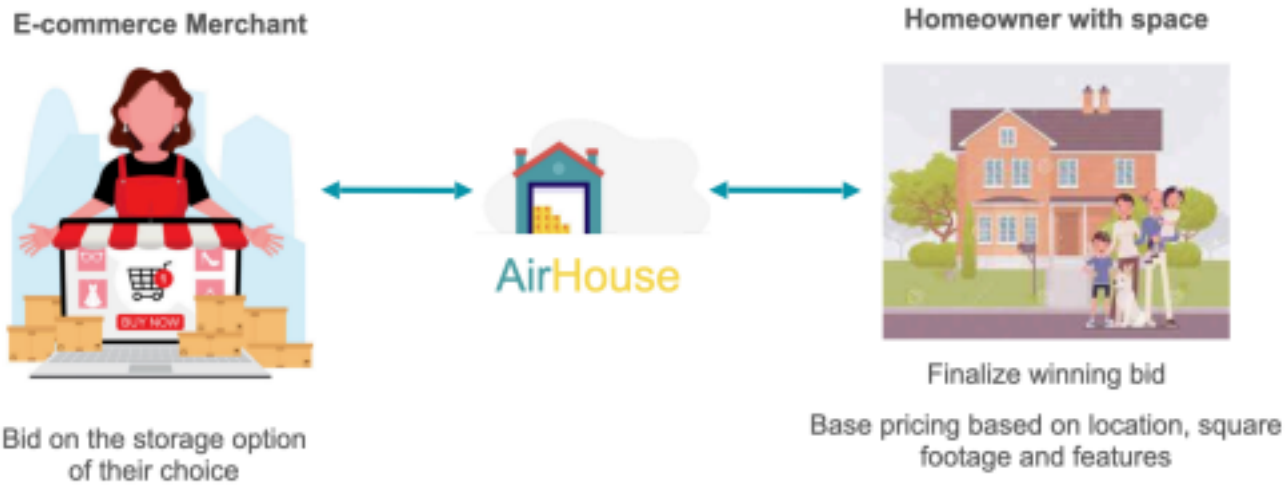
Warehouse Market Analysis
ASKING RENT AND VACANCY RATE
$1.25
$1.00
$0.75
$0.50
$0.25
$0.00
10.0%
8.0%
6.0%
4.0%
2.0%
0.0%
4Q18
4Q19
4Q20
4Q21
4Q22
Average Asking Rent ($/SF)
Availability (%)

US Retail Ecommerce Sales, 2018-2024
billions, % change, and % of total retail sales
$523.64
$600.10
$794.50
$843.15
$952.76
$1,072.81
$1,204.77
13.6%
14.6%
32.4%
15.0%
16.3%
17.7%
19.2%
9.9%
11.0%
14.4%
6.1%
13.0%
12.6%
12.3%
2018
2019
2020
2021
2022
2023
2024
Retail ecommerce sales
% change
% of total retail sales
Note: includes products or services ordered using the internet, regardless of the method of payment or fulfillment; excludes travel and event tickets, payments such as bill pay, taxes or money transfers, food services and drinking place sales, gambling and other vice goods sales
Source: eMarketer, Oct 2020
259467
www.eMarketer.com

Source: Cushman & Wakefield

2. Our Solution - “AirHouse"

Our core solution to the warehouse problem is to develop an ‘AirBnB’ style platform for empty spaces in single family homes. We call the platform - ***‘AirHouse’***. It will be a real time bidding platform, a two sided marketplace. *AirHouse* will connect online merchants that need space to the single family homeowners - who can offer space on rent. Since *AirHouse* will be focussing on online merchants selling consumer goods, it will provide them with storage space as close to their customer as it gets. The base price for the space will be based on location, square footage, rating and any additional features the location may offer.



3. Value Proposition

3.1 Homeowners

For Homeowners, *AirHouse* offers an alternate cash stream by helping to monetize an empty space in their homes. With *AirHouse* they can do so without inviting a stranger in their homes. Home owners have the opportunity to expand and become a full time warehouse business if their space and time constraints allow them to do so.

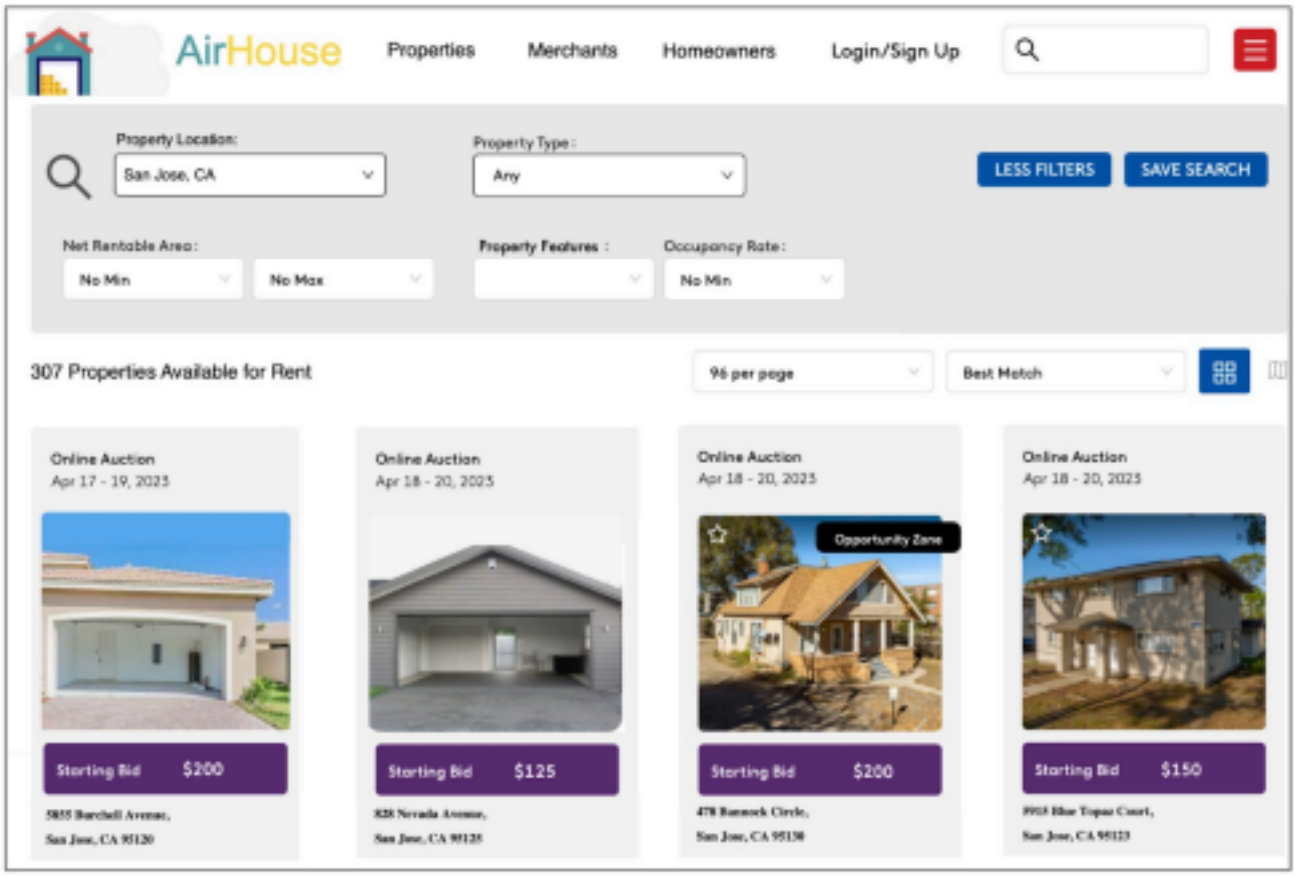
3.2 E-Commerce Merchants

AirHouse offers an economical storage option for the small business e commerce merchants. *AirHouse* offers on-demand space renting with no lengthy contracts. Merchants will have flexibility in choosing space to rent as well as time duration to rent it for. They will have choice of multiple close-to-end point storage locations from where they will be able to do the last mile delivery at very cheap rates. *AirHouse* will enable online merchants to meet the 2 day or less delivery challenge without paying the high fees.

4. Product User Interface:

We plan to start with a web based platform offering. Our initial product user interface is shown on next page. There will be two pages, one each for 'homeowners' and 'merchants'. On the merchants page, they would be able to see available storage listings for a specific location. They can then apply specific filters such as net rentable area, starting bid, starting time or property features such as temperature control or 24*7 access. On the homeowners page they would be able to see what merchants are looking for storage in their geographical

area and price are they willing to offer. If the homeowners find the merchants' terms acceptable then they would be able to contact the merchant and accept the contract. Both the parties would be able to offer reviews of each other. The intent is to create a community of trusted merchants and homeowners that would increase the engagement on the platform.



5. Product Phases

The *AirHouse* team plans to introduce the product in two phases as detailed below. The idea with two phases is to establish a solid storage space and market presence before expanding into other areas of e-commerce fulfillment.

5.1 Phase 1

Phase 1 is shown schematically on the next page. In this phase, we focus entirely on being a storage space provider. Here an online merchant will go on our website, bid and find a place to store goods. Once a place is secured the merchant will transfer inventory from mfg. to storage. After the merchant receives an online order, the merchant

would arrange delivery of goods from the storage location to the customer. Hence the merchant would be responsible for the movement of the finished goods at every step. *AirHouse* platform would only provide the avenue to find storage space.

5.2 Phase 2

After we have established a base, we will roll out the second phase. In this phase we will offer coordinated shipping with a partner at discounted rates. The *AirHouse* platform will offer complete integration with customer's fulfillment platform. Most eCommerce businesses depend on multichannel selling to survive. To support this, *AirHouse* will integrate seamlessly with multiple sales platforms. A merchant would be able to view and track the progress of goods movement in real time online, via a dashboard. The contracted shipper will be responsible for goods movement from the manufacturing house to the contracted warehouse. The selection of warehouse would still be by bidding process by the merchant.

When the orders come in; we will offer the option of garage-side pickup for a extra charge from homeowner or last mile delivery with a partner. The garage-side pickup would be an optional service offered by homeowner for additional fees. The homeowner would be able to decide if such a service is offered all day or at certain times during the day. The last mile delivery will be in partnership with a package delivery service in line with service recently started by 'DoorDash'. The idea behind both the services is for the merchants to be able to deliver products to customers in under 2 hours. With storage locations in the heart of residential neighborhoods, AirHouse aims to provide e-commerce merchants ability to leap frog other industry giants in the delivery time race. Phase 2 is shown schematically on the next page.

6. Concept Validation

5.1 Supply

To validate the concept and supply, we did a survey of single family homeowners in South Bay area with a median home size of 1800 square feet. In order to be objective, the question specifically focussed on the garage space in single family homes. The sample selected was friends and family of the *AirHouse* team and they were encouraged to provide an unbiased perspective. We received 18 responses and the median age of the respondents was 38 years. A screenshot of the survey sent out through email is shown on the next page. The respondents were only asked four questions. We intentionally left out any questions regarding the price homeowners would like to charge.

About 62% of the respondents were in favor of the concept. One homeowner commented that he liked *AirHouse* because he was not inviting a stranger in his living space (reference: AirBnB). For about 20% of the respondents on the edge, the issues of privacy, safety and security were the leading concerns. AirHouse plans to mitigate the concerns in our product offering. The respondents who were not in favor of the concept primarily did so because they did not have space in their garages; and not because they were against the concept. It is likely that some of these respondents may

be motivated to participate on the platform if the revenue generated was substantial for them.

6.2 E-Commerce Merchants

On the demand side, our product caters to small business owners like Kristie pictured here who sells everything from pens, stickers to tote bags and needs time variable,

space flexible, storage close to consumers that she can rent on demand. Currently, Kristie stores her inventory in her own home or in the attic space of her parent's home. *AirHouse* would offer great value to small business owners like Kristie.

7. Business Model

AirHouse will charge 7% commission on every transaction. The commission is intentionally low to attract merchants to our platform and build relationships. The low commission is also meant to offer some discount to merchants because *AirHouse* would not be offering shipping. Additionally we want to also undercut the competition. For all bids, AirHouse will recommend a base price based on the location, square footage, and storage features.
On all winning bids, AirHouse will charge a 7% transaction fee.

8. Go To Market Strategy

8.1 Hyperlocal

Our launch go to market strategy is to go hyperlocal. We will focus on the SF bay area and refine the product. We plan to form a location-based specialized Marketing and Sales team. The main focus of these teams will be to survey the target market and customer base. We plan to launch our platform offering to a select customer focus group of homeowners and e-commerce merchants. The learnings from this group will then be used to incrementally update and refine the product.

8.2 Business Plan

We will partner with online sellers on Ebay and Etsy and focus on small volume consumer goods such as clothing and shoes. Our focus on clothing and shoes is driven by the fact that the clothing & footwear segment was the highest contributor to the online sales, with USD 23019.39 million in 2021, and is estimated to reach USD 58408.73 million by 2030, at a CAGR of 10.9% [9]. The team will place online local advertisements on platforms such as Craigslist, Facebook local marketplace, etc. to attract homeowners as well as e
commerce merchants. Additionally, to attract homeowners, the team will survey the stores or places often visited by homeowners. For example: Home depot, grocery stores, local libraries, restaurants, etc. The teams will then put up brochures near these places in order to increase brand awareness.

8.3 Price

We will offer promotional discounts to long term rentals to encourage merchants to rent longer periods on the platform and retain them.

8.4 Trust

To build trust and to motivate those people concerned about safety and liability; *AirHouse* will offer lockable storage pods, liability insurance and merchant verification services.

9. Roadmap

In 2023-2024, we plan to launch our pilot with a focus group of 20 homeowners in the San Jose area and 20 e-commerce merchants. We will iterate on our platform offering using this focus group and refine the product.
In 2025, after the product is refined with the help of the focus group, we plan to expand to the entire SF bay area by targeting 25,000 homeowners and 100+ e-commerce merchants. As the next step of our roadmap, in 2026, we aim to expand the offering to the entire California state. This will also be the year when AirHouse will show a net positive revenue.

In the same year AirHouse team will start work on expanding platform capabilities to integrate logistics as detailed in the phase 2 plan. The year after this, in 2027, we plan to expand to major cities in the USA. Our projections show 18M in revenue this year. In the same year we will pilot the phase 2 with integrated logistics only for the SF bay area. In the same manner as phase 1 the intent is to refine the phase 2 approach before we launch it across the USA region.

10. Market Size

The global e-commerce fulfillment services market size was valued at USD 97.33 billion in 2022 and is expected to grow at a compound annual growth rate (CAGR) of 13.9% from 2023 to 2030 [10]. This will be driven by the growth of e-commerce which in turn will be driven by consumer goods. The e-commerce fulfillment services market consists of warehousing/storage, bundling, shipping and other services. The chart shown on the next page shows the e-commerce fulfillment services market for North America and also subdivides it by different segments.
We can estimate the market size for 2026 by looking at the bar plots. Based on this, we can estimate that the total market size for USA in 2026 is $30 billion of which warehousing and storage accounts for about $9 billion. Total available market is thus $30 billion and serviceable available market is $9 billion.

11. Financials

Following are the assumptions made to estimate revenue, gross profit and net profit.
Revenue: Revenue is estimated based on the total number of square footage rented on the platform. To estimate the rented square footage; two assumptions are made: (1) That 0.4% of total available single family homes in a particular geographical area will be rented on the platform - from the AirBnB experience (% listings from the total available housing units) (2) On an average 300 square feet will be rented from each single family home. To estimate the transacted dollars on the platform; the square footage number is multiple by a reasonable dollar/square feet value based on commercial rents in California. The AirHouse revenue is 7% of the transacted dollars on the platform.
Variable costs are assumed to be 4% of the transacted dollars which will cover liability insurance and merchant verification costs. The fixed costs are mainly the salaries of the employees. During the pilot program and platform development, it is assumed that the founders will draw no salary. In subsequent years the number of employees needed is as detailed in the table 3.

Table 1: Calculating Total Square Footage Rented On AirHouse

	2023	2024	2025	2026
Total sq feet on platform	6000	1,305,000	9000000	98400000
number of homes	20	1,450,000	8,514,695	82,000,000
% of homes on platform	na	0.3%	0.4%	0.4%
Avg sq feet rented	300	300	300	300
Where	San Jose Pilot	SF Bay Area	California	USA
No. of Customers	20	4,350	30000	328000

Table 2: Total SFHs In SF Bay Area

County	Number of Housing Units
Alameda County	350000
Contra Costa	300000
Marin	70000
Napa	30000
San Francisco	125000
San Mateo	175000
Santa Clara	300000
Solano	100000
Total	**1,450,000**

Marketing $10,000 $15,000 $22,500 $33,750

Table 3: Calculation of Fixed Costs

Year 1 Year 2 Year 3 Year 4

Fixed Costs

No office, remote work, Laptops and Wifi for everyone, SW security

G&A $25,000 $27,500 $30,250 $33,275

Promotions, advertisements, subsidies for homeowners, travel

Sales,

Salary $0 $600,000 $680,000 $840,000 x3 founders + engineers

Founder

Number 3 3 3 3 $120k/yr

Engineer

Number 0 3 4 6 $80k/yr Table 4: Financial Calculations

Year 1 Year 2 Year 3 Year 4

% commission 7 7 7 7

Square

footage rented 6000 1305000 9000000 98400000 **$/Sq Feet** $2.00 $2.20 $2.86 $2.72

Transacted

Revenue $12,000 $2,871,000 $25,740,000 $267,352,800 **Revenues** $840 $200,970 $1,801,800 $18,714,696 **Variable Costs** $1,000 $114,840 $1,029,600 $10,694,112 **Gross Profit** -$160 $86,130 $772,200 $8,020,584 **Fixed costs** $35,000 $670,000 $732,750

$907,025 **Net Profit** -$35,160 -$583,870 $39,450 $7,113,559

With the roadmap we presented before, we expect to net positive in year 3 and reach 18M in revenue by year 4. We would have about 100MSF of storage space on our platform with about 0.4% of single family homes in USA - which is in line with AirBnB experience.

12. Competition

In phase 1, *AirHouse* will compete with storage providers such as commercial warehouses, Public Storage and Warehouse Exchange. Warehouse Exchange is an online warehouse marketplace that matches warehouse owners with businesses seeking warehouse space. It serves commercial warehouses alone.
In phase 2, *Airhouse* will compete with a number of businesses as shown in the table 5 below. All these businesses are bottlenecked by available commercial warehouse space. They have to either construct new warehouse space, which is very expensive and unsustainable or rent space from existing warehouses. These warehouses are not always located close to end customer which generates demand for added transportation.

13. Investment

We are looking for $250,000 dollars for the first 18 months. This will help us: • Develop the platform
• Launch the pilot program in San Jose
• Engage 25k distinct homeowners and 100+ merchants on the platform in SF bay area

AirHouse will sustainably create 100MSF of warehouse space with $0 in construction

cost.

Table 5: Competition Summary

Competition	**Specifics**	**What about ware house space**
ShipBob	Tech-enabled 3PL proprietary software	Uses commercial fulfillment space
Flexe	Has a network of approximately 1,000 warehousesrepresenting roughly 30 million square feet.	connects warehouse providers who have excess capacity and services with retailers and brands who need flexible solutions.

Stord	Operates a network of vetted, third-party facilities (comprising a range of warehouse types) and freight routes to service retail, consumer packaged goods, manufacturing, food and beverage, medical, industrial, and telecom companies. Clients can place and manage orders through Stord's cloud-hosted dashboard.	NA
Ware2Go	Is owned by UPS and launched in 2018. It offers a warehousing and nationwide fulfillment network to help merchants position products closer to customers for fast and reliable delivery. Its integrated service for storage, pick, pack, and shipping is offered via a cloud-based platform	UPS centers
Deliverr	E-commerce fulfillment company based in the United States of America. They integrate with eCommerce marketplaces, such as Walmart, eBay, Amazon, Shopify, Wish, and BigCommerce	NA
FlowSpace	Cloud-based fulfillment software integrates with ecommerce platforms, Amazon, Walmart's marketplaceShipStation, and other providers.	No ware house space
Darkstore	Focuses on same-day and one-hour delivery for Direct to consumer brands using robots	Not in Operation
Warehowz	On demand warehousing	Commercial warehouses
Warehouse Exchange	Online marketplace that matches warehouse owners with businesses seeking warehouse space	NA
Amazon Fulfilment Services	Fulfillment service that helps Amazon sellers outsource shipping to Amazon. With this ecommerce fulfillment option, Amazon stores, picks, packs, ships, and delivers the products to customers.	Amazon warehouses
Public Storage	Rentable storage	

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