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homes

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INTRODUCTION

It's all started some time ago when I got ready to make the most important purchase in my life - I was about to buy a home for me. And unfortunately, I had an awful experience. I had an agent who was supposed to help me with my search and make my buying experience better. But instead I had a feeling that I am doing all job, and everything he did was confusing me.

And that's not only my problem. On average, in the United States, it takes more than four months to buy a home and more than three months to sell.

However, then I discovered that this is an even bigger problem for agents, brokers, and real estate developers because they invest much money in sales and marketing but struggle with the super long sales cycle and low conversion. Because even in such personal business, it is tough to remember everything about every client and every property.

That is how I started my previous company - Brainify. And initially, the purpose of the project was the scaling of previous product to the United States market.

As a result, we totally pivoted the product. Incorporated another company. Changed the brand. Moreover, we have already helped to complete over 7,000 transactions.

Later on, I will make a complete overview of our journey that started with the question "How can we scale?" to "How can we bring more value to our users?". Searching answers to these issues came as the core subject of this thesis work and product that we created.

SECTION I: PROBLEM

1.1 WHY REAL ESTATE SALES ARE SO HARD

Real estate sales are hard. It is even hard to argue with that. The current home buying or home selling process is enormously costly and time-consuming. However, there is a hope that AI for real estate sales can change this.

On average, it takes 4.3 months to buy a home, and 2.8 months to sell. Zillow and others changed real estate transactions by empowering the buyer with information as they start searching for a home to buy or listing homes for sale. This put consumers firmly in the driving seat.

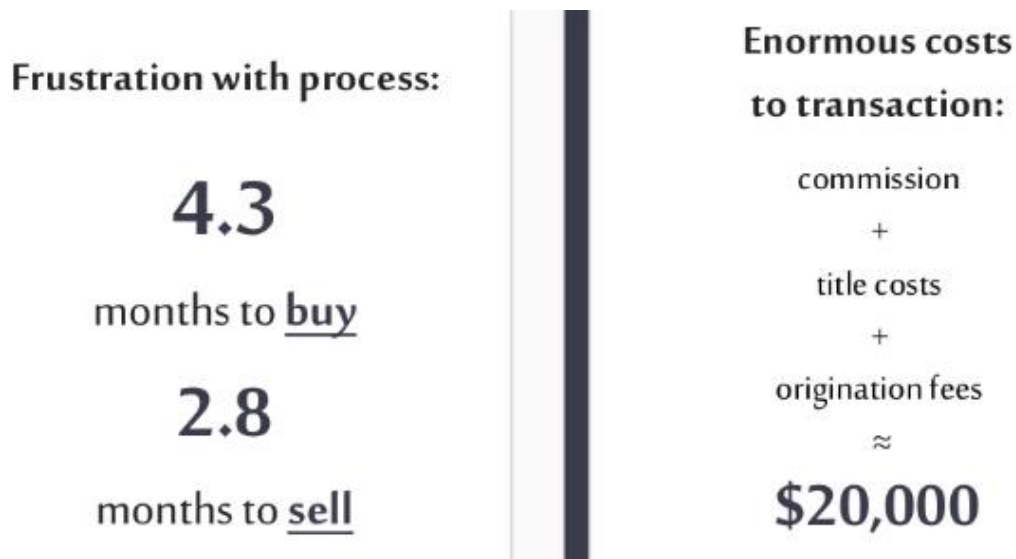


Figure 1. Why real estate sales are so hard.

For the last ten years, agents almost give up their role in an essential part of the home buying process: listing search and advise. Moreover, this put agents and brokers in position when they need to change not to be replaced. Data and technology is the key to that change.

In many real estate brokerages, data analysis teams are flooded with a never-ending stream of one-off data requests. However, this option is not available to every agent but is essential for everyone who is working with buyers.

And what is more important, home buying or home selling is a very personalized process. That is why it is tough to use generalized data to support this kind of decisions.

1.2 RESIDENTIAL REAL ESTATE MARKET IN NUMBERS

Real estate is the biggest group of assets in the world. Real estate market is estimated globally at around \$228 trillion. In 2017, US residential real estate alone was worth \$31.8 trillion (homes in the Los Angeles and New York metro areas are worth \$2.7 trillion and \$2.6 trillion), and the value of home sales in 2017 totaled about \$1.77 trillion and a \$485 billion annual US rental market. With an average 5% broker commission per deal, it makes residential real estate sales commission market approximately \$80 billion.

\$31.8 trillion	\$80 billion
<hr/>	<hr/>
Total value of residential real estate in the US	Annual US residential real estate brokerage commissions
\$485 billion	\$15 trillion
<hr/>	<hr/>
Annual residential US rental payments	Estimated value of US commercial real estate

Figure 2. Real Estate Market in 4 numbers.

At the same time, the number of transactions seems to be stable during the last few years.

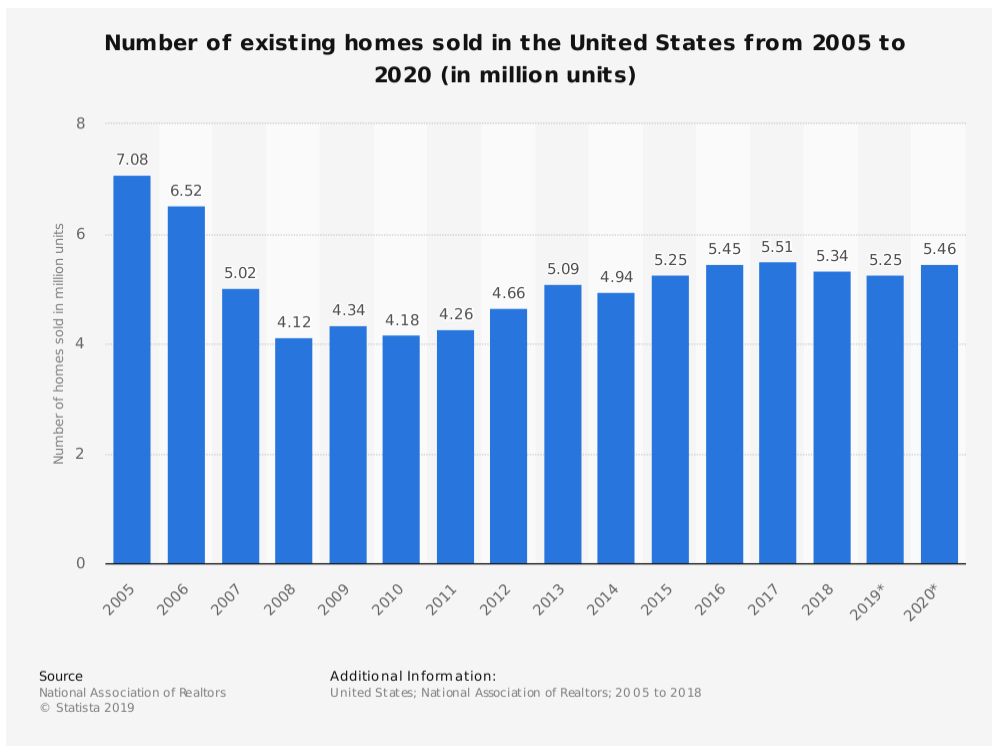


Figure 3. Number of homes sold in the US from 2005 to 2020.

However, the number of registered agents is growing every year. The Association of Real Estate License Law Officials (ARELLO) estimates that there are about 2 million active real estate licensees in the United States.

Moreover, according to the 2012 Economic Census, there are 86,004 real estate brokerage firms operating in the United States.

According to the NAR technology report, 27% of agents and 21% of brokers spent between \$501 and \$2,000 on technology in 2018.

1.3 THE PROBLEM OF BUYERS AND SELLERS

Well, the real problem is that nothing really changed for the last 30 years. The current transaction process is enormously costly (costing tens of thousands of dollars, including commission, title costs, and other fees).

However, there is one factor, that is about to change that all. The decade between roughly 2005 and 2015 saw the first phase of tech adoption in the home-buying process, as home buyers increasingly began their home searches online. After 2005, with the launch of consumer-oriented online real estate products Trulia and Zillow, comprehensive, easy-to-access online property information became available to the public for the first time.

Trulia and Zillow changed real estate transactions by empowering the consumer with information as they began searching for or listing homes for sale. This put consumers firmly in the driving seat. Since 2015, the majority of home buyers initialize and find their home online, and then transition to a complicated and mostly analog transaction process. This will change.

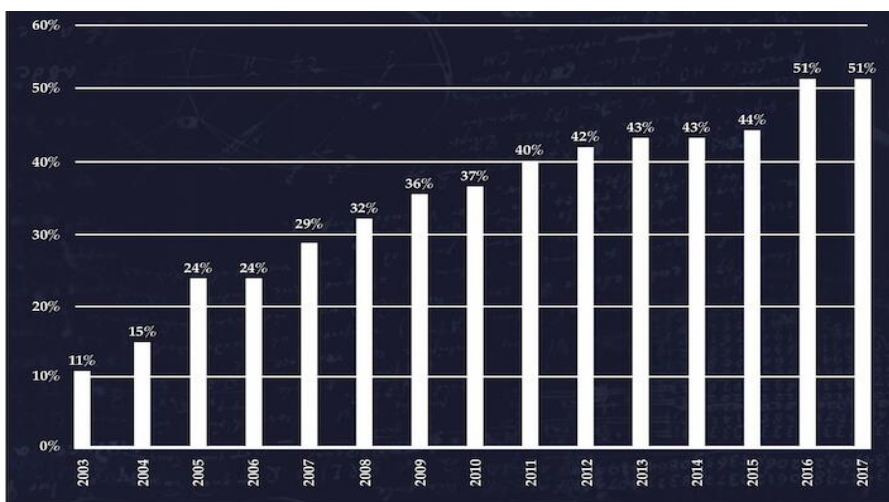


Figure 4. Percentage of buyers that found their home online.

With consumers growing accustomed to more control, emboldened with greater access to information, the market is pushing changes to the current process. Long story short - buyers and sellers want cheaper and faster transaction process, not losing transaction security and confidence in the deal. Also, this is bringing us to the problem with agents.

1.4 THE PROBLEM FOR AGENTS

While consumers are taking the driver's seat, agents are getting worried. What will happen to them? Does the market still go to need them, or they are just going to be eliminated by tech companies, as that almost happened to taxi drivers with the Uber case?

According to NAR, most buyers are still using real estate agents, as 92% of Homebuyers purchased their home through a real estate professional. It's 7% more than compared to 10 years ago.

However, the problem is different. As I mentioned before, the number of agents grew, but the number of transactions is pretty the same. That leads to fewer transactions per agent, and as a fact, the mode of transactions per agent is 0, with the average 1,7 deals per agent. That means that if OpenDoor makes 36,000 deals a year or Ryan Serhant makes 450 deals in NYC, there are plenty of real estate professionals that cannot make a dime.

At the same time, real estate marketing for agent becomes more and more expensive. In some zip codes price per lead can reach up to \$500. Together with very low conversion benchmarks, it is pretty clear that real estate agent needs to invest a fortune to scale their businesses.

1.5 THE PROBLEM FOR BROKERAGES

While agents are worried about their business on a personal level, brokerages are worried about the same but on a larger scale. They are investing a lot in sales and marketing and are suffering from long sales cycles and low conversion, especially during market slow down.

The market shift caused significant changes in the market landscape. During 2018 many brokerages filed bankruptcy, including few behemoths like Town Residential and Eastern Consolidated.

The role of brokerage became less impactful during the last few years. If before brokerages provided agents with listings, leads, operational and marketing support, today listing data became publicly available, leads are coming from portals like Zillow and Trulia and plenty of apps are simplifying operations, and the last value brokerages think they are especially valuable for - is their brand power (while some agents like Ryan Serhant or Frederick Ecklund have stronger brands than brokerages they are working with).

1.6 DATA IS THE KEY

While agents and brokers are searching for the solution outside, the truth is that they already have almost everything essential to solve this problem for them.

The key is the data.

As 92% of buyers purchased with an agent or broker, that means that probably 99% of all leads were contacted by the agent or broker, and their data is stored somewhere in their databases.

So, if they already have this data, they can use it to their advance. Right?

Unfortunately, all that data is usually not used efficiently. Also, in most cases, that data is people generated and not clean. Probably, it was poured into CRM and thousands of spreadsheets from millions of agent's notepads.

We understand that real estate agents are not leaving soon, as people are still going to need their services to buy real estate in highly competitive markets. They are quite inefficient, but data and technology can help them perform better, and provide better service to people.

We believe that these problems above are not "sales" problems; they are "math" problems. So, we will try to solve them.

SECTION II: SOLUTION

In this part, I tried to describe our journey of coming up with a solution, coming up with first assumptions, and verifying them with first potential customers and users.

2.1 COMING UP WITH ASSUMPTIONS

From our previous experience, we knew that real estate agents struggle with their sales process. During the previous three years with Brainify, we talked to hundreds of real estate executives and real estate agents.

So that was a problem. Probability of being wrong with conclusions because of bias was higher than our chances to guess right in a first attempt.

During brainstorming with my team and interviews with potential users, we outlined core assumptions with the help of a few tools and frameworks.

The business model has been outlined with the help of the Business Canvas Model. Also, I used the Customer Profile Canvas to describe Propertymate's ICP with their objectives, pains, and potential gains from the solution that we are offering them.

The Value Map Canvas was then used to decompose our value proposition to a more detailed view and interconnect it with the objectives and pains of our customers as defined in the Customer Profile Canvas.

2.2 RESEARCH AND INTERVIEWS

One of the fundamental lessons I got from MSTM program is to ask your users before building anything. I had a few assumptions regarding the potential target audience, and I decided to reach out to each of them personally. To make the preparation and interviewing process easier, I used several tools in the process.

Preparation to the interview took us five steps:

1. Prospecting of potential customers and users
2. Reach out to potential customers
3. Conducting a survey
4. Scheduling additional interview
5. Conducting an interview

Below I have described each step in more details.

1. Prospecting of potential customers and users

I used LinkedIn as the central platform, combined with a service for lead prospecting and email extraction - Findthatlead.com. I decided to focus on finding real estate professionals in one of 3 cities: New York, San Francisco, and Los Angeles. For less than two weeks, we have managed to collect over 1700 prospects in our spreadsheet. Most of them were real estate agents, but also we managed to receive contacts of executives of some of the largest brokerages in the United States.

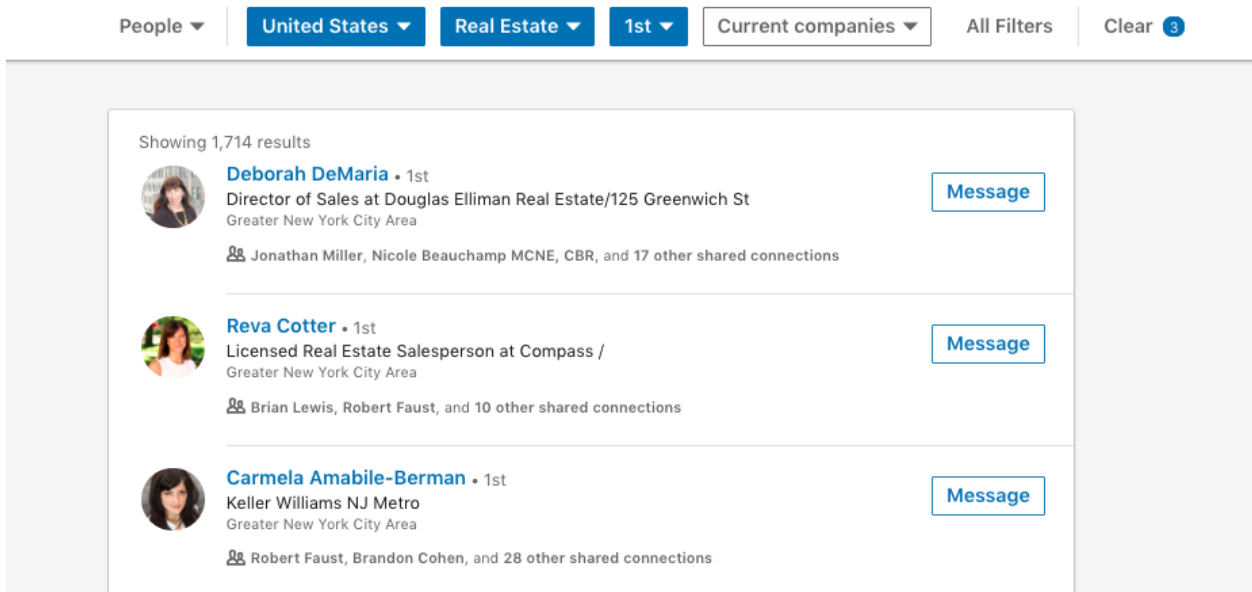


Figure 5. LinkedIn screenshot with a list of prospects.

2. Reach out to potential customers

To simplify the communication process, I used Mailshake.com. Mailshake is a Gmail cold mailing service enabling automation of email campaigns. It provides the advantage of predefined email templates available in the software to create email campaigns. Mailshake lets users easily schedule any mailing campaign to prospect list.

With the help of Mailshake, I reached out to 1632 connections with the primary purpose of conducting research and scheduling a call.

I have sent a sequence of 3 emails, which resulted in 1289 opened communications, 212 sequences with clicks, and 130 replies.

I consider these results as standard.

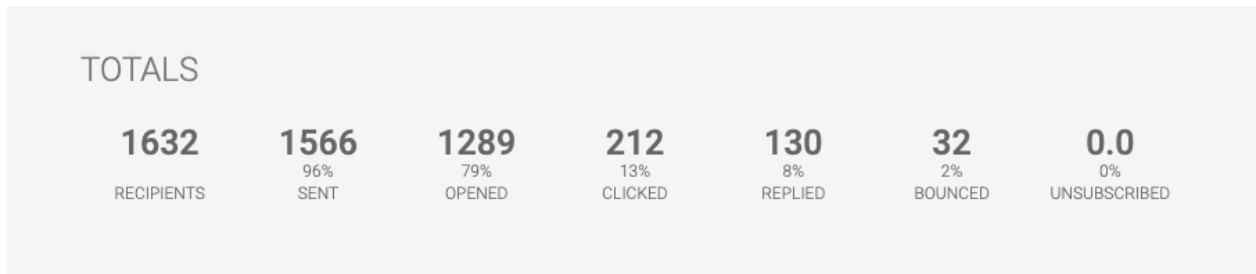


Figure 6. Mailshake campaign statistics.

The first email included an introduction with a request to have a quick talk about real estate sales toolset. Back then, I still pitched prospects with Brainify brand. Contacts that replied were passed directly to scheduling an interview.

[✉ Initial campaign email](#)

Nice to meet you (Bohdan from Brainify)

Hi {{first:there}},

Thank you for adding me to your LinkedIn network.
I found your profile last week and I think that we can be helpful to each other.

I am Bohdan - a founder of [Brainify](#) - a company that makes sales automation software for residential property development companies. We have helped more than 60 real estate development companies increase and automate their sales.

Right now we are doing a great research on best practices of the sales process in property development companies. First of all, we want to understand better their processes. Our goal is to improve techniques and tools for sales automation and sales effectiveness in this industry. I hope that this research could be useful for you as well.

I am very interested in your experience at {{company name:new developments sales}} and I have a few questions about your sales process.

Would you mind if I asked you a couple of questions about it? Actually, those are just general questions, which are more about your toolset, than your team's sales process at {{company name:your company}}.

{{first}}, I really appreciate your help!

Anyway, feel free to contact me anytime if you need my help.

Have a great day!

Figure 7. 1st email in the sequence.

Following emails in the sequence were follow-ups on initial communication and included links to the questionnaire.

3. Conducting a survey

We used Typeform.com to create a questionnaire and analyze the results. Typeform

is an online software company that specializes in online form building and online surveys. Its leading software creates dynamic forms based on user needs.

Except for contacts, that were coming from the cold email campaign I created an advertising campaign on LinkedIn, targeting collected and similar audiences to get more results.

The primary purpose of a questionnaire was to learn more about the daily workflow of the audience, their roles, responsibilities, and tools they were using in the real estate sales process.

Key stats

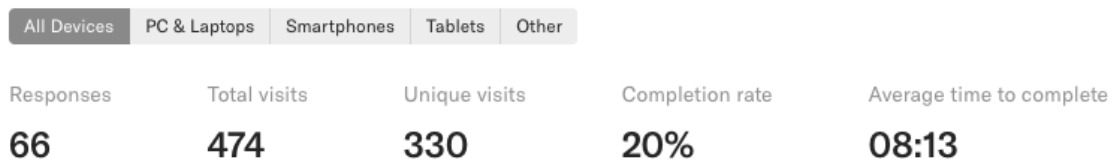


Figure 8. Statistics screenshot from Typeform survey.



Real Estate sales tools research

This research is essential to understand why Real Estate Industry remains barely touched by technology. Answer following questions and help us to bring innovations in real estate to the new level.

Start press ENTER

Figure 9. Screenshot of the questionnaire

Based on the received answers, I received a few main conclusions.

- 65% of the agents were using Excel spreadsheets to organize their sales process.
- 23% of the agents were using a CRM system to organize their sales process.
- Average NPS of CRM users was -36, which is unsatisfied.

Besides that, I collected a wide list of agent's pains and problems, which is described in Customer Map (2.8) and Value Map(2.9) sections.

4. Scheduling additional interview

After conducting the survey, I personally reached out to 45 prospects to schedule the interview. I used Calendly to simplify the scheduling process.

Calendly is a scheduling software that enables its users to streamline their appointment schedules.

5. Conducting an interview

After the interviews were scheduled, I conducted 32 video calls made with the help of Zoom and 7 personal meetings. 6 candidates have not replied.

On average one video call took around 25 minutes to complete. Personal meetings were a little bit longer and took on average 40 minutes to complete.

Target audience: Residential Real Estate professionals from New York, San Francisco, and Los Angeles.

Method:

One-to-one interviews.

Statistics:

39 people were interviewed

Interviews were a part of continuing qualitative research with open questions to gain a deep understanding of the needs of real estate organizations and agents.

During interviews, we discovered a lot of impactful insights. However, what was even more critical, we crystalized key stakeholders and customer segments that helped us to build a solution and the final product.

One of the most valuable knowledge outputs of the MSTM program was the importance of research before building a solution or a product.

The primary purpose of this process was to understand if we, as a business, do have the market with pains and problems they want us to solve for them.

I described my discoveries more in the following parts.

2.3 STAKEHOLDERS

During the research process, we defined key stakeholders and their problems. I outlined them below, to give a better understanding of their primary responsibilities, goals, and involvement in the real estate sales process.

1. Real estate sales agent.

Real estate sales agents were the most significant segment of our audience. Usually, they are the stakeholders that end up using any solution and are personally involved in any sales transactions. Also, by default, agents represent one of two roles - buy-side agent - a realtor that helps the client to buy a home — alternatively, sell-side agent - professional that helps the client to sell a home.

Every agent I talked to describe their needs in two key points - the number of deals and sales velocity. In other words, what they needed was growing sales conversion and shortening the sales cycle.

It turned out that one of the biggest pains for the agents is FOMO of losing a deal and need to fill in all data in the CRM or contact management system.

2. Sales Operations Manager or Sales Director

Stakeholders in this group are usually reliable for the supervision of the organizational and work processes of real estate agents that are working under a real estate brokerage or new development real estate project.

They are usually interested in group performance indicators and keeping up with sales goals that they get from the top management. One of their most significant pain is being unable to predict accurate sales results.

Stakeholders in this group usually are deciding on purchasing software for small and medium-sized real estate organizations they are working in. However, they tend to advise with agents and top-management before making a purchase.

3. Sales Coordinator

Stakeholders in this role are usually responsible for organizing the inventory in listing management system or inventory base, collecting updates from real estate agents, and creating reports for Sales Operations Managers or Sales Directors.

Usually, stakeholders in this role are the most active users of sales process tools within real estate organizations.

4. Real Estate Developer

Stakeholders in this role are usually not involved in the sales process, but they are controlling the budgets for new development projects.

Their biggest problem is keeping up with sales velocity.

5. Real Estate Marketing Manager.

Stakeholders in this role are usually not involved in the sales process personally, but they are responsible for a lead generation for real estate agents and are controlling the largest share of the budget.

Most significant problems of real estate marketing managers are Marketing ROI and keeping up with lead generation goals.

2.4 CUSTOMER SEGMENTS ASSUMPTION

After defining key stakeholders, I outlined the central assumption of customer groups.

We decided to focus on the most underserved segments of the market, that have strongest pains.

- **Small & Medium Residential Real Estate Brokerages**

Biggest group on the market. We intentionally excluded large brokerages as usually they very complicated buyers, and often they have proprietary solutions at the place, which has high switching cost.

The small brokerage represents real estate organization with up to 50 agents. Medium-sized brokerages are affiliated with from 50 to 1000 real estate agents.

Decision makers about purchasing sales software are usually sales operations managers (VP of Sales), marketing managers (CMO or VP of Marketing) or executives responsible for technology of innovation (CIO or CTO).

According to the 2012 Economic Census, there are more than 85,000 Small & Medium Residential Real Estate Brokerage firms.

- **New Homes Sales Teams**

Usually, decision makers in this group are Sales Directors of the new development projects. Most active users are Sales Coordinators or On-site Coordinators.

It is hard to calculate the accurate number of New Homes Sales Teams in the United States, but there were 667,000 newly constructed homes sold in 2018, according to the U.S. Census Bureau.

I decided to exclude Residential Multifamily Real Estate Developers as a customer group, as they are not involved in the sales process.

- Real Estate Agents

This group is very attractive because of the number of representatives on the market. According to Arelllo, 2,000,000 active real estate agents are operating in the United States, including 1,327,880 NAR Members as of March 2019.

86% of real estate agents are independent contractors, while only 5% are employees.

Agents are free to decide what software and tools they want to use, but usually, tools are provided by the real estate organization they are affiliated with.

2.5 PROBLEM ASSUMPTION

After coming up with Customer Segments, I outlined the main problems they share.

- 1) Stakeholders suffer from slow sales velocity.

Transaction process is very time-consuming for real estate professionals.

- 2) Stakeholders suffer from low sales conversion.

Real estate organizations invest many resources in the sales and marketing operations, but still experience low sales conversion, which is on average 0,5 - 1%.

3) Stakeholders suffer from an inefficient communication process.

Real estate agents are dissatisfied with their communication process with other agents and real estate organizations.

2.6 SOLUTION ASSUMPTION

Understanding problems, our team start thinking on a solution, that might be a universal pain killer for each customer segment.

The key idea is that a solution must be the product, that helps real estate agents and organizations to improve sales velocity and sales conversion through better analysis of the data about clients and properties on the market.

During our previous experiments, we found out that the property that the client purchase is the average mix of features person liked in other multiple listings.

We called this process, “The matching of homebuyers with properties.”

So, our short product description is “A tool that helps real estate agents and brokerages to understand homebuyers better and match them with all properties on the market.”

Though we did research before and crystallized the product description from the potential customers and users’ feedback, we still had a few solution assumptions to verify.

- 1) Real estate agents are ready to use a dedicated product for matching of homebuyers and properties.
- 2) The product can improve sales velocity and sales conversion.
- 3) Real estate organizations will be ready to pay for the product.
- 4) Real estate organizations and agents will be ready to share the client-related data with a third party.
- 5) The company that makes a product can find a scalable and repeatable business model.

2.7 BUSINESS MODEL

After conducting research, interviewing potential customers and users, and outlining key customer segment, problem and solution assumptions, I decided to put together the business model assumption.

Complete and precisely defined business model stands as an essential part of the planning of the business and its chances to gain success. It was not an exception with PropertyMate as well, so we decided to incorporate the approach, initially introduced by Alexander Osterwalder, reflected in the Business Model Canvas.

Business Model Canvas consist of the next sections:

1. Value propositions. This segment provides an outline of the core value proposition our solution aims to produce to our customer segments and how it should stand out on the market.
2. Customer relationships. This segment provides an outline of the shape and inner content of the customer relationships we want to build.

3. Customer segments. This part provides an outline of the customer segments that were selected for our research and marketing activities.
4. Key activities. This section provides an outline of the key activities we are executing in order to produce the value for our customers.
5. Key Partnerships. This segment provides an outline of the list of partnerships we aim to build in order to achieve our business objectives, both technical and marketing.
6. Key resources. This segment provides an outline of the main resources we will require in order to generate value for our customers and support our operations.
7. Channels. This section provides an outline of the leading marketing channels that we are going to exploit to penetrate the market and build relationships with our target customers.
8. Cost structure. This section provides an outline of the cost structure of our business operations.
9. Revenue Streams. This section provides an outline of the key revenue streams we are going to exploit in order to generate revenue and build a profitable and sustainable business model.

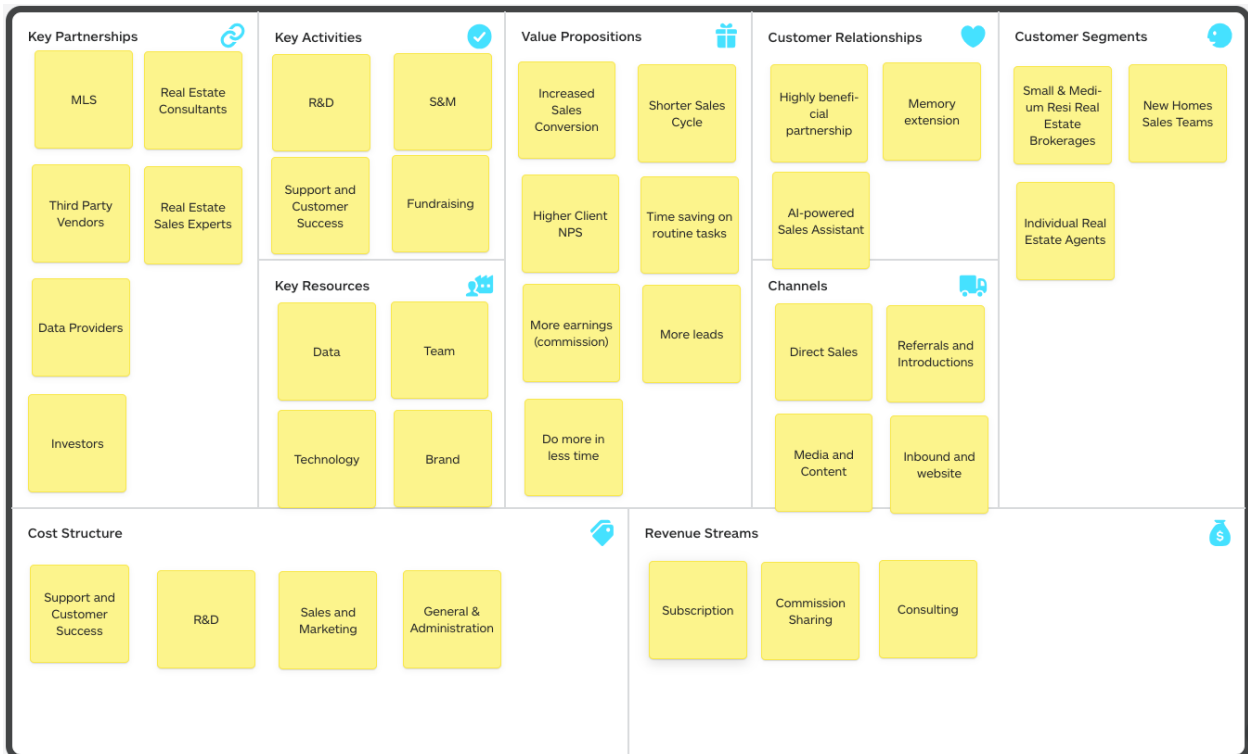


Figure 10. Business model canvas

Below I listed every point within nine sections of Business Model Canvas and described some of them with more details.

1. Value propositions.

- Increased Sales Conversion
- Shorter Sales Cycle
- Higher Client NPS
- Time Saving on Routine Tasks
- More Earnings (Commissions)
- More Leads
- Do more in less time

In Propertymate everything we build is done to make the business of real estate agent better than it was before through organizing them and providing them with insights and tools that have a high impact.

Our primary focus is the improvement of agent's overall experience, but as every result-oriented people, each agent has a set of metrics that are important for them. We assumed that the most wanted are increased sales conversion, shorter sales cycle, and more earnings.

2. Customer relationships.

- Highly beneficial partnership
- Memory extension
- AI-powered sales assistant

Thinking about customer relationship, I tried to focus on “How customers should think about us?”. Among “Beneficial partnership” and “Sales Assistant,” it is essential to be associated with some superpower everyone wants to have, but not everyone can afford. We decided that in our case, it would be “Memory extension” of the agent that allows him to remember everything about every property and every client.

3. Customer segments.

- Small & Medium Residential Real Estate Brokerages
- New Homes Sales Teams
- Real Estate Agents

4. Key activities.

- Research and Development
- Sales and Marketing
- Support and Customer Success
- Fundraising

5. Key partnerships.

- MLS
- Third Party Vendors
- Data Providers
- Investors
- Real Estate Consultants
- Real Estate Sales Experts

In real estate technology, data is the key. To get all data that is needed to make a solution that will have an impact on agents business we need to partner with all data providers, particularly with MLS (Multiple Listing Service), third-party solutions that are involved in current workflow and other data providers.

Also, we need would definitely need help with a sales process and product development from Real Estate consultants and sales experts.

6. Key resources.

- Data

- Team
- Technology
- Brand

7. Channels.

- Direct Sales
- Referrals and Introductions
- Media and Content
- Inbound and Website

We expect to sell to brokerages to get agents and new development projects in bulks. The best way to do it is through direct sales and introductions from our advisors. Media and Inbound marketing should power up our sales operations.

We decided to focus on direct sales, as we expect that there will be much more efficient to reach out to specific decision makers than push everyone with marketing.

8. Cost structure.

- Research and Development
- Sales and Marketing
- Support and Infrastructure (CoGS)
- General and Administration

Planning cost structure, we created the financial plan document, where we outlined all financial assumptions and goals.

	x	x	x	x	x	x	x	x	x	x	x	x	Total year 1
PRO-FORMA P&L (\$)													
Revenues	24 940	29 482	31 764	38 241	42 679	51 539	58 350	71 060	86 175	100 099	119 415	140 927	794 671
CoGS	3 947	4 999	6 885	8 964	12 535	12 688	13 607	19 249	19 683	21 742	26 604	23 212	174 114
% of revenues	16%	17%	22%	23%	29%	25%	23%	27%	23%	22%	22%	16%	22%
Gross Profit	20 993	24 483	24 880	29 278	30 144	38 851	44 742	51 811	66 493	78 357	92 811	117 715	620 558
% of revenues	84%	83%	78%	77%	71%	75%	77%	73%	77%	78%	78%	84%	78%
Operating Costs													
R&D	11 247	15 153	14 253	14 253	19 767	22 929	26 818	35 687	39 679	37 968	38 076	40 617	316 447
% of revenues	45%	51%	45%	37%	46%	44%	46%	50%	46%	38%	32%	29%	40%
S&M	5 982	34 987	27 810	27 910	28 210	29 410	36 572	37 172	42 995	38 983	47 998	47 198	405 227
% of revenues	24%	119%	88%	73%	66%	57%	63%	52%	50%	39%	40%	33%	51%
G&A	7 558	29 718	27 705	15 163	15 629	17 836	16 665	18 840	19 049	18 523	19 739	22 822	229 247
% of revenues	30%	101%	87%	40%	37%	35%	29%	27%	22%	19%	17%	16%	29%
Taxes (Franchise tax)	374	442	476	574	640	773	875	1 066	1 293	1 501	1 791	2 114	11 920
% of revenues	1,5%	1,5%	1,5%	1,5%	1,5%	1,5%	1,5%	1,5%	1,5%	1,5%	1,5%	1,5%	1,5%
Total Operating Costs	24 786	79 858	69 769	57 326	63 607	70 175	80 055	91 699	101 723	95 474	105 813	110 637	950 921
% of revenues	99%	271%	220%	150%	149%	136%	137%	129%	118%	95%	89%	79%	120%
EBIT	-3 794	-55 375	-44 889	-28 048	-33 463	-31 324	-35 312	-39 888	-35 230	-17 116	-13 002	7 078	-330 363

Figure 11. Extract from the financial plan

Due to our assumptions, Research and Development during the year should be equal to 40% of annual revenue, Sales and Marketing to 51% of annual revenue, General and Administration to 29% of revenue, and Cost of Goods Sold, which represents Support and Infrastructure, should be no more than 22% of annual revenue.

To fund these operations, we were planning to raise funds and breaking even by the end of year one.

9. Revenue Streams.

- Subscription based revenue
- License fees
- Commission Sharing
- Consulting

We expected to earn money in subscription and license fees, charging our different customer types by different models.

New developments sales and marketing teams, real estate developers and brokerages that intend to use our product in our interface are charged based on inventory and users' base size, charging \$49 user/month, and \$199 project month billed annually or monthly.

Example:

	Number	Monthly	Annually
Users	10	\$490	\$ 5,880
Projects	6	\$1194	\$ 14,300
Total			\$ 20,200

Figure 11. Example of teams-oriented business model

Brokerages, that are using Propertymate to provide matching benefits inside their existing CRM/Marketing solutions are billed based on the number of API calls/month + one-time set-up fee.

Example:

	Number	Monthly	Annually
Set-up fee	1	-	\$ 10,000
API Calls	100,000	\$4,000	\$ 48,000
Overages	1	\$0,04	
Total			\$ 58,000

Figure 12. Example of pay-per-usage business model

Agents, that are using Propertymate as a service to improve business and personal efficiency will be charged an annual/month subscription fee approximately \$20-\$50 / month.

Commission sharing business model

Except for subscription fee, we want to charge our customers for every successful transaction that made via Propertymate matching network with transaction or commission (5% of agent's commission) fees.

Example:

	Transaction	Agent's commission	Propertymate fee
1	\$250,000	\$15,000 (6%)	\$750 (5%)
2	\$1,000,000	\$50,000 (5%)	\$2,500 (5%)
3	\$2,000,000	\$100,000 (5%)	\$5,000 (5%)

Figure 13. Example of commission-sharing business model

Following data above, we have build assumptions regarding our unit-economics.

Type of account	ARPA	CAC	LTV (18/36)	Churn rate (m/y)
Agent	\$336	\$44	\$504	7%
Enterprise	\$16,400	\$6,645	\$49,200	11%

Figure 14. Unit-economics assumptions

After that we have built prediction regarding our potential growth.

	Q4 2018	Q4 2019	Q4 2020	Q4 2021
MRR Q4	\$32,000	\$120,000	\$350,000	\$730,000
MoM Growth	9%	11%	13%	8%
Gross Profit	62%	77%	82%	89%
# of Agents	200+	5,000+	19,000+	45,000+
# of Enterprises	40+	70+	110+	180+

Figure 15. Growth assumption

2.8 CUSTOMER MAP ASSUMPTION

The customer profile is a part of the Value Proposition Canvas that defines a range of assumed customer characteristics that are then connected to their respective value

propositions in the Value Map.

Customer characteristics in the Customer Profile are subjects to further verification to justify corresponding value propositions.



Figure 16. Customer Profile Map

Following our research and assumptions, I prepared the Customer Profile Map that included a list of customer's jobs, pains, and gains.

Customer's jobs:

- Property search for a client
- Lead generation

- Communication with homebuyers
- Filling in interests and criteria
- Transaction management

Customer jobs above are the basis of the workflow of every real estate organization. But at the same time, real estate agents and firms have pains and fears that can block implementation of any software solution.

Customer's pains:

- Fear to lose the data
- Complicated integration with legacy software and existing tools
- Complicated adoption to the new software
- Manual data input
- Low sales conversion

While most of the real estate agents got used to these pains, we believe that implementation of our product in the process can improve it significantly, and bring in following gains.

Customer's gains:

- Higher sales conversion
- Shorter sales cycle
- Business predictability and growth
- Transparent communication
- Higher client NPS

2.9 VALUE MAP ASSUMPTION

Value Map represents a set of value propositions in the product to address specific customer characteristics listed in the section "Customer Profile."

Section "Features and Services" matches "Customer's Jobs."

Value propositions in the block Gain Creators are addressing the Customer's Gains, whereas Pain Relievers are corresponding to the Customer's Pains as outlined in the Customer Profile.

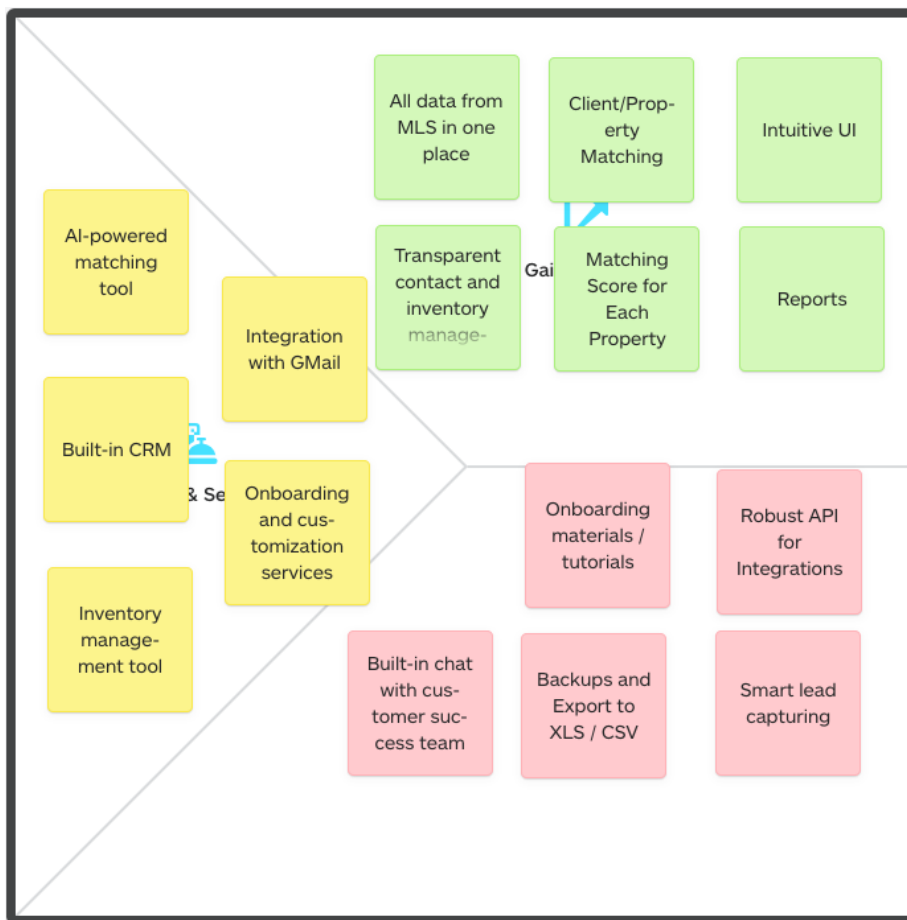


Figure 17. Customer Value Map

Features and Services:

- AI-powered matching tool
- Built-in CRM
- Inventory management tool
- Integration with GMail
- Onboarding and Customization Services

Gain Creators

- All data from MLS in one place
- Client and Property matching
- Intuitive UI
- Transparent contact and inventory management
- Matching Score for each property
- Reports

Pain Relievers

- Onboarding materials and tutorials
- Robust API for integration
- Backups and Export to CSV and XLS formats
- Built-in chat with customer success team
- Smart lead capturing

2.10 TECHNOLOGY

Due to Intellectual Property security reasons, I cannot disclose all details of how does Propertymate's technology works. However, I tried to briefly describe the process and use cases, to give a better idea of how it works.

Before building a product, we analyzed more than 600,000 properties and tens of thousands of home buyers to understand their decisions. Our team was trying to understand why a particular client liked a specific apartment, though it was over his budget? Also, why another client closed on a condominium in a particular neighborhood, but before that, he or she was only looking at totally different areas? We tried to understand what is "this might be my future home" feeling and turn it into the data.

We figured out, that if we dig into listing data, descriptions, photos, and locations of listings, we could see some pattern to understand what is essential for every buyer personally.

This is how our matching was born. We learned how to analyze all relevant listing data, learned how to understand the priority. Also, finally, learned how to assign this data we got to homebuyers and properties with the help of Machine Learning. Also, we learned how to do it on a massive scale.

So, in our case, "AI for Real Estate Sales" is a mix of a few Machine Learning tools and techniques that allow us to match all agent's contact base with all listed properties on the market instantly — helping them to find the ideal home for each of their clients in the fastest way.

To make this possible, we build multiple microservices that were performing simultaneously in order to organize Data Analysis, Data Standardization, Data Enrichment, Recommendation, and Distribution.

2.11 MVP

Before starting the validation process of our assumptions, we needed to build an MVP, to make sure that the product and technology we have build, will bring the value to potential customers.

Below I outlined delivery, goals, features, and technical details of the MVP.

Delivery:

Recommendation system for brokers to match customer and property.

Goals:

1. Create the first version of the recommendation system;
2. Create a dataset for future improvement of the recommendation model;

Features:

1. History about a specific client and his interactions with properties;
2. Recommendation of new properties based on interaction with previous properties;
3. Possibility to manually add a property with main filters:
 - location;
 - price;
 - number of bedrooms;and secondary filters;
4. Possibility to leave comments about customer preferences.

Technical details:

1. Recommendation system on this stage will provide recommendation only based on structured features.

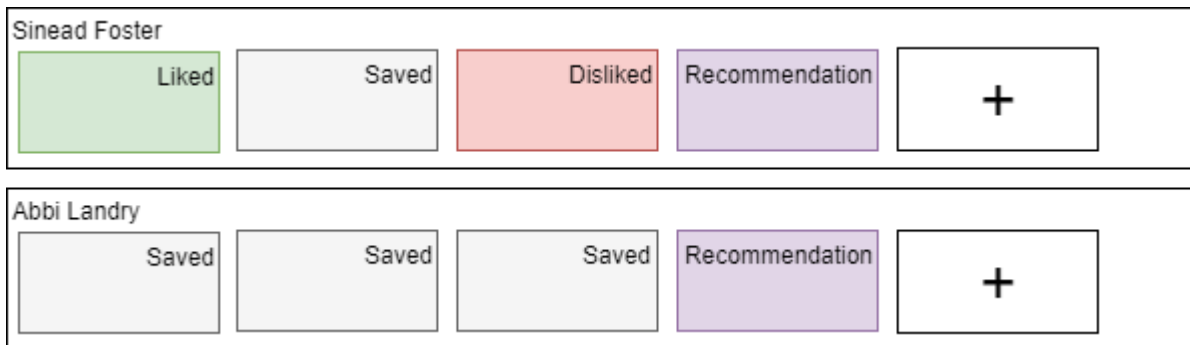


Figure 18. MVP description

2.12 VALIDATION

Thanks to the research at the beginning of our process and connections we collected, it was not complicated to validate our solution assumptions having MVP.

First, I validated the next four assumptions.

1. Real estate agents are ready to use a dedicated product for matching of homebuyers and properties.
2. The product can improve sales velocity and sales conversion.
3. Real estate organizations will be ready to pay for the product.
4. Real estate organizations and agents will be ready to share the client-related data with a third party.

We decided to execute repeating personal interviews with some of the initial prospects to get their feedback on MVP, verify solution assumption, and receive additional insights and user stories.

Target audience: Residential Real Estate Agents, New Developments Sales Directors, Marketing and Sales Operations Managers. All of them are based in New York City.

Method:

One-to-one interviews.

Design workshop.

Statistics:

47 people were interviewed.

9 people participated in design workshop.

Outcome:

We validated that real estate agents are ready to use a dedicated product for matching of homebuyers and properties.

We proved that the product can improve sales velocity and sales conversion.

We validated that real estate organizations will be ready to pay for the product.

We verified that real estate organizations and agents will be ready to share the client-related data with a third party.

2.13 USER STORIES

We used validation opportunity to learn more about potential customers needs and wants.

As a result, I outlined them below, collecting them by each customer segment.

User stories addressing needs of real estate agents:

1. As an agent, I want to be able to see the whole list of my contacts.
2. As an agent, I want to be able to see all properties from MLS.
3. As an agent, I want to be able to create a contact, with all related information.
4. As an agent, I want to be able to edit contact profile.
5. As an agent, I want to be able to see best matched properties for a client.
6. As an agent, I want to be able to list a property.
As an agent, I want to be able to see best matched leads for listed property.
7. As an agent, I want to be able to see my email correspondence with a client in client profile.
8. As an agent, I want to get notifications about new matches.

User stories addressing needs of real estate brokerage:

1. As a brokerage manager, I want to be able to integrate Propertymate with the brokerage CRM.
2. As a brokerage manager, I want to be able to generate reports based on the agent's performance.
3. As a brokerage manager, I want to be able to integrate Propertymate with marketing solutions we are using.
4. As a brokerage manager, I want to be able to set up permission management.
5. As a brokerage manager, I want to be able to see all data and all potential matches within the brokerage.

User stories addressing the needs of new developments sales and marketing teams:

1. As a new development manager, I want to be able to manage inventory of a new development project.

2. As a new development manager, I want to be able to match homebuyers with available units of a project.
3. As a new development manager, I want to be able to match available units with potential homebuyers.
4. As a new development manager, I want to be able to integrate website forms with Propertymate.
5. As a new development manager, I want to be able to generate sales and availability reports.

2.14 COMPETITION ANALYSIS

We understood that as a “Tool that helps real estate agents and brokerages to understand homebuyers better and match them with all properties on the market,” we might have a unique positioning, but we are still in the category of sales enablement solutions for real estate.

Thanks to our research process in the beginning, we outlined the list of products agents are using nowadays to solve similar problems.

But instead of trying to copy all features made by our direct and indirect competitors, we are focusing on our technology and building good integration environment to bring more value to our users.

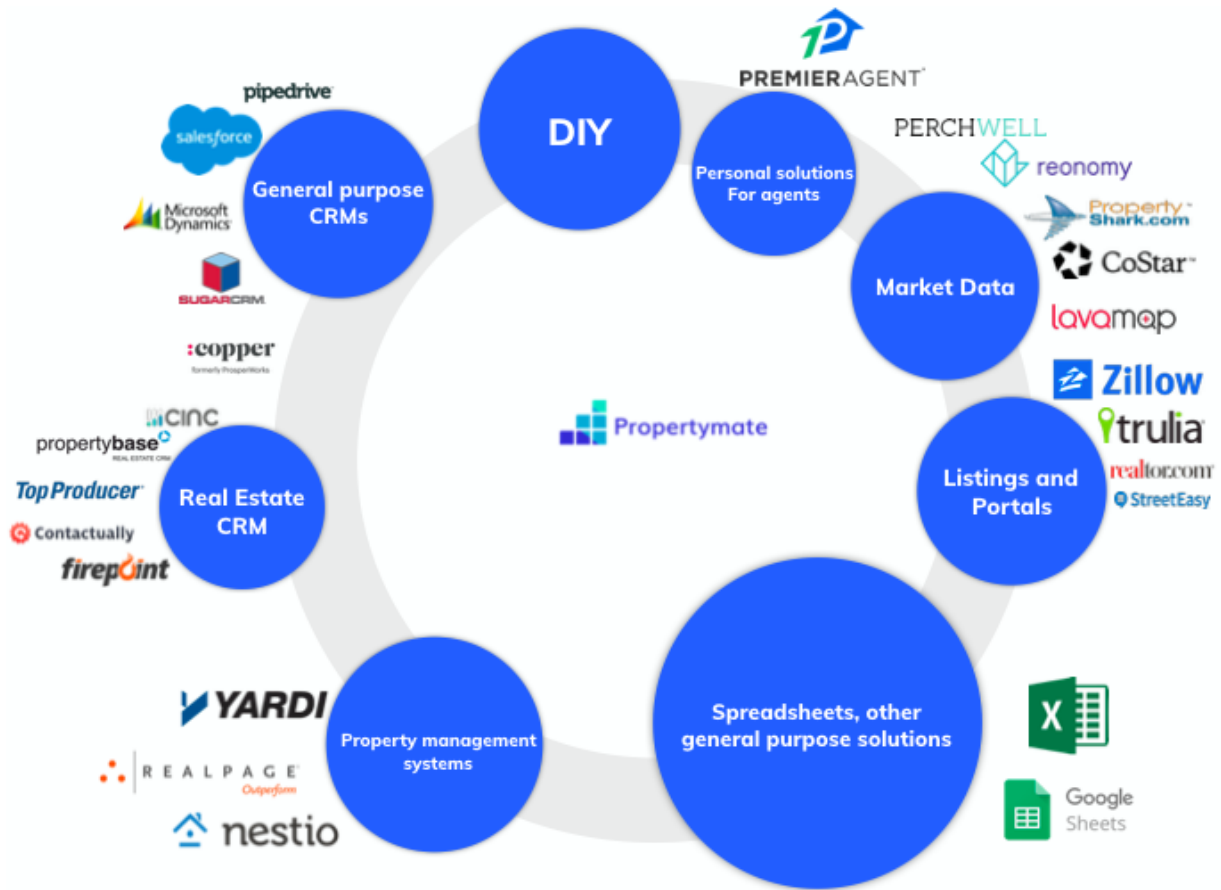


Figure 19. Competition and Integration landscape

The biggest and closest competition segments are:

1. Spreadsheets and other general-purpose solutions.
2. DIY - proprietary software build by the company that is using it.
3. Real Estate CRM systems
4. General purpose CRM systems
5. Personal marketing solutions for real estate agents

I selected the most used web-based products in each segment, to analyze them and identify opportunities.

1. Google Spreadsheets - a spreadsheet program included as part of a free, web-based software office suite offered by Google. The app is compatible with Microsoft Excel file formats.
2. Copper - is a cloud-based customer relationship management tool that gives users complete views of their customers. The program is applicable to any industry, including advertising, distribution and real estate.
3. Premier agent - is a software designed to connect agents with active buyers and sellers to help them grow their business, as well as providing them with tools and resources to help them convert those buyers and sellers into clients.
4. Contactually - is a web-based CRM focused on real estate industry.

2.15 HARVEY BALLS ANALYSIS

To find opportunities for improvement, we used Harvey Balls diagram, presented to our group by Scott Selhorst during Product Management module of the MSTM program.

We asked some of the respondents from previous groups evaluate each product from 1 to 5, based on five main criteria:

- Value for Agents
- Value for Brokers
- User Experience and Usability
- Data quality
- Affordability and Pricing

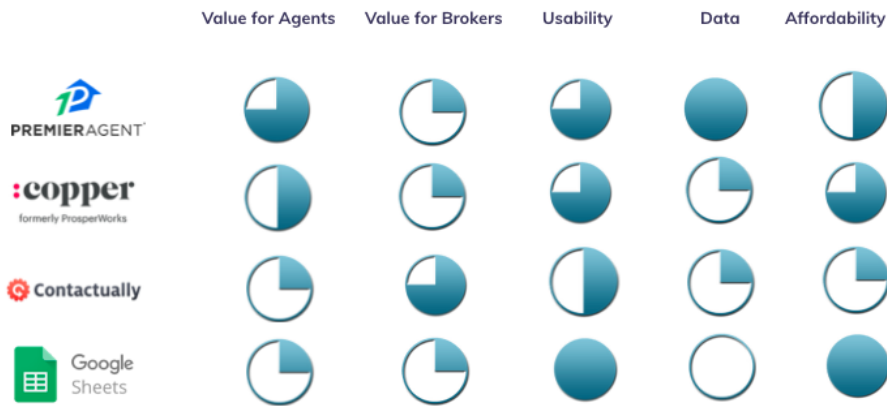


Figure 20. Harvey Balls Chart

2.16 MARKETING POSITIONING

Since we learned what is essential for our target audience, we were ready to start working on positioning and crafting marketing tools to start a sales process.

We created different landing pages for two audiences: New Development teams and Real Estate agents.

Regarding brokerages, we decided to start with marketing presentations.

For “New Development,” we decided to focus on key values, we are delivering. To make it catchy, we designed an interactive description that simulates typewriting.

Title:

New homes need new solutions.

Sub-title:

Propertymate is AI-powered operational system for new developments, that helps you: to automate sales process /

to achieve better collaboration for agents /
 to match property with leads /
 to manage inventory smarter/
 to forget about spreadsheets /

Button (Call to Action):
 Request Demo / Get Demo

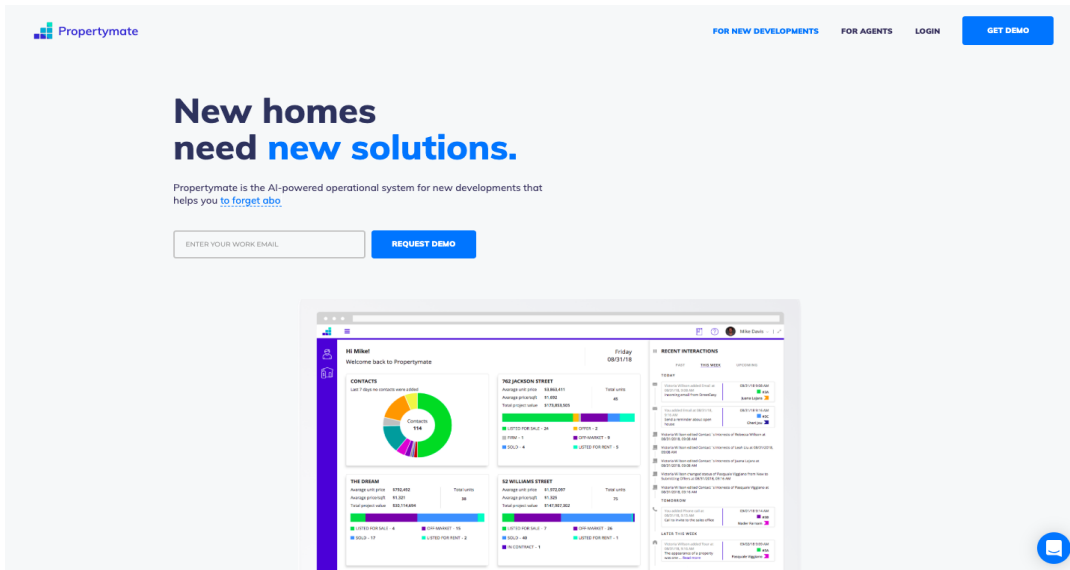


Figure 21. Screenshot of a landing page “For New Developments”

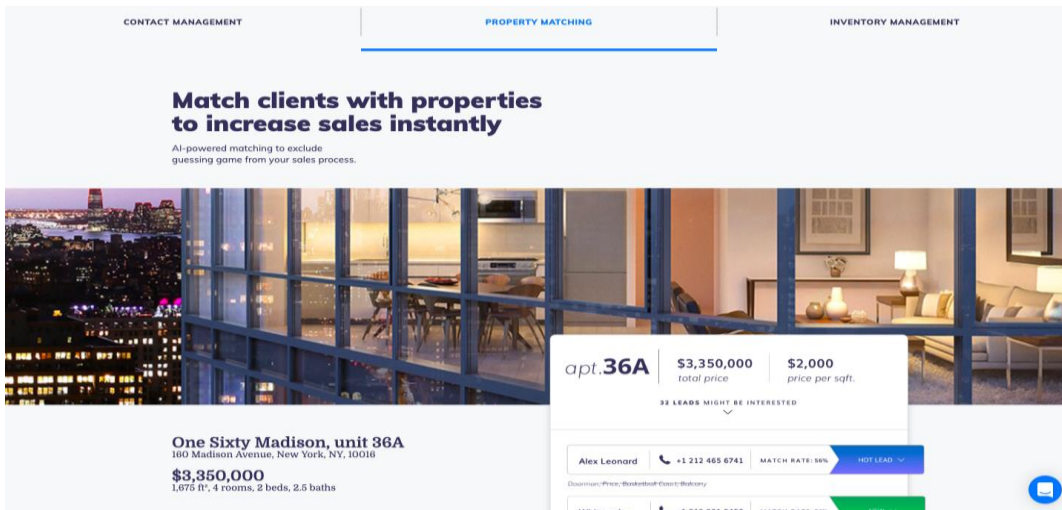


Figure 22. Screenshot of a landing page “For New Developments”

On landing page “For Agents” we focused on personal agent’s gains, features that were going to be in product and integrations with their existing workflow.

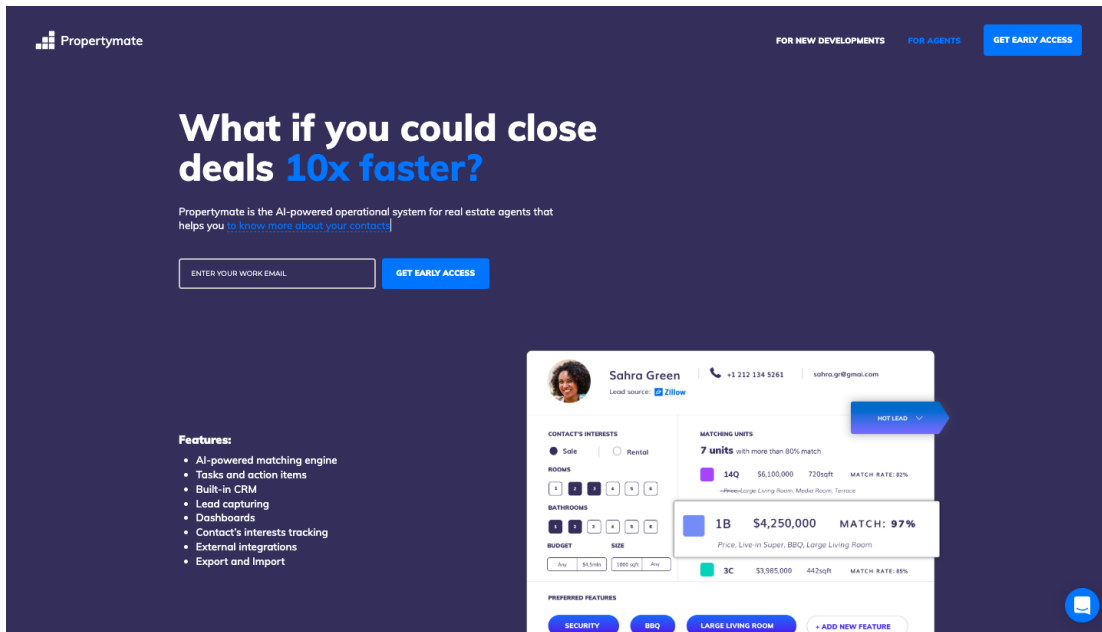


Figure 23. Screenshot of a landing page “For Agents”

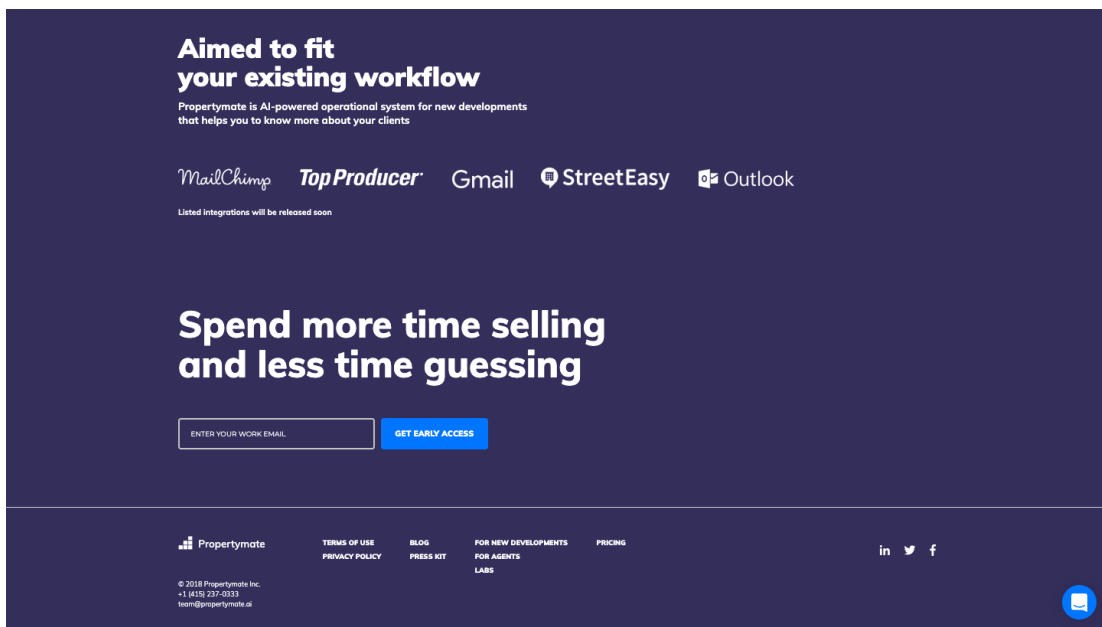


Figure 24. Screenshot of a landing page “For Agents”

SECTION III: GO-TO MARKET

3.1 THE PRODUCT

Finally, we were able to create the product, focusing on data quality and agents experience.

The product consisted of four main modules: Dashboard, Contact Base, Property Base, and Settings.

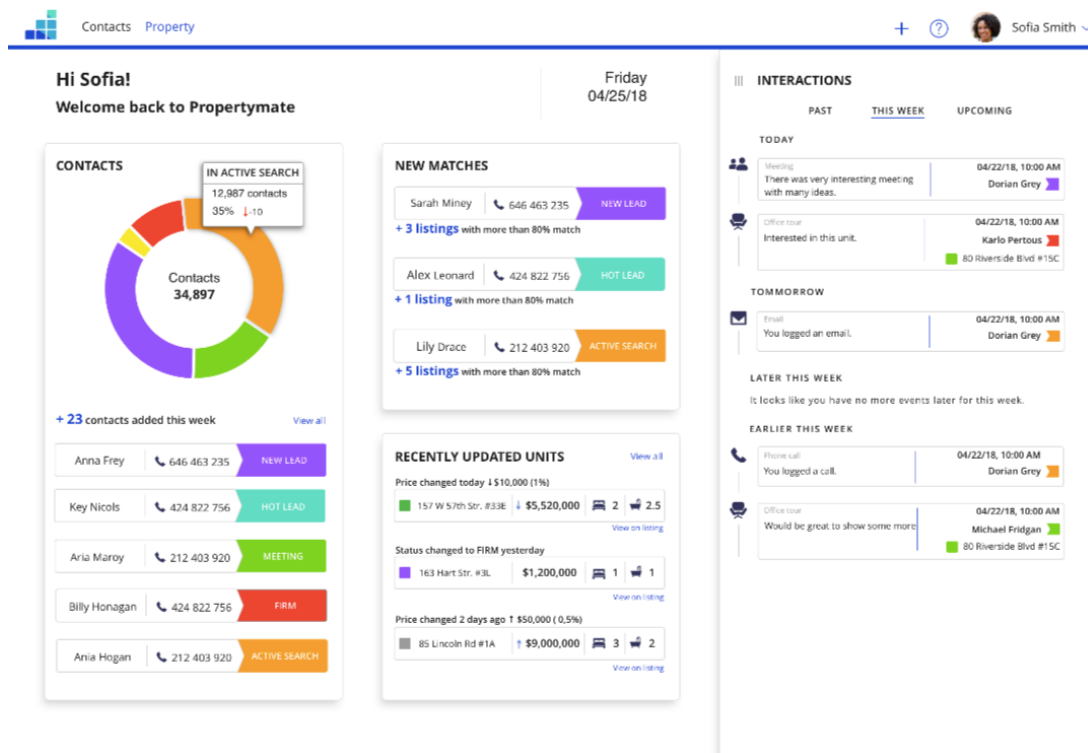


Figure 25. Screenshot of a Dashboard Module

The use-case is quite simple:

An agent has captured a potential buyer and now has to find propositions according to the buyer's needs. In Propertymate, the agent has access to all properties on the market, and we help narrow it down before the manual selection process at the end. Using Propertymate, the agent can do it in seconds, and focus more on communication and closing the deal.

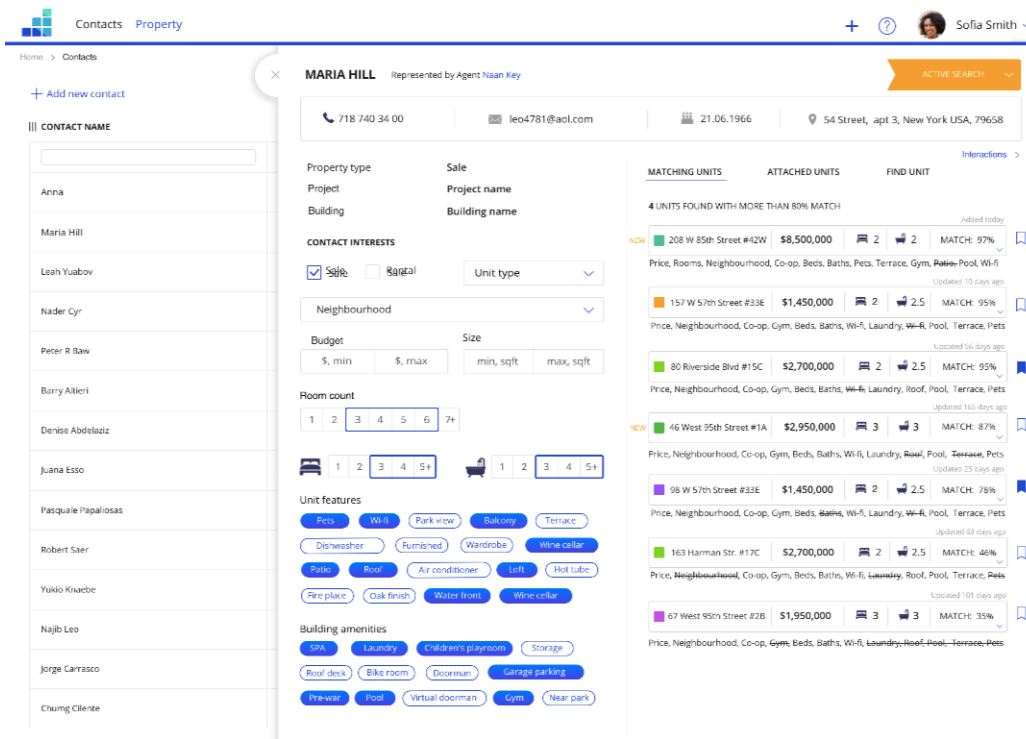


Figure 26. Screenshot of a Contact Profile - Matching Section

When you think about this kind of calculations, we do to provide every Propertymate user with this data, it is hard to imagine this as a simple and straightforward solution, but as all that matters is agent experience, we tried to fit it in an effortless way.

With the high-fidelity account and buyer/home matching algorithms, customizable tiebreakers, and automated contact creation agents can rest easy that CRM contacts from marketing and sales activities will automatically end up in the right place in Propertymate. Once matched, Propertymate leverages the power of AI to analyze sentiment, detect buyers' interests, and enrich contact data to both solve for matching business and personal contact resolution and supercharge data.

CONTACT NAME	EMAIL	PHONE NUMBER	STATUS
Anita	anita.v@gmail.com	646 223 87 67	NEW
Maria Hill	leo4781@aol.com	718-749-3400	ACTIVE SEARCH
Leah Yuabov	leahyu@hcm.com	718-665-1110	NEW
Nader Cyr	nfarman@sof.com	315-337-4390	ENGAGED LEAD
Peter R Barv	PIromano,SA@yahoo.com	718-948-6783	NEW
Barry Altieri	barrymartinevina@yahoo.com	718-564-1618	ENGAGED LEAD
Denise Abdelaziz	dmct792@yahoo.com	518-739-5401	MEETING
Juana Esso	juanaajara@man.com	718-564-1618	NEW
Pasquale Papafiosas	pasqualepapafiosas@yahoo.com	(631)649-4440	CLOSED
Robert Seer	rpa1@optonline.net	718-268-0700	NEW
Yukio Knaebe	sakura@ystelecom.com	(315)298-2212	NEW
Najib Leo	happy244@yahoo.com	518-285-1119	MEETING
Jorge Carrasco	jorgecarrasco@mon.com	518-456-6518	COLD CALL
Chung Cliente	davidwan88@hotmail.com	718-740-3400	NEW

Figure 27. Screenshot of a Contact Base Module

UNIT 1A
46 West 95th Street #1A

Property type: Sale
Project: Western Park
Building: Somerby
Floor: 10
Area: 1,475 sqft
Price: \$2,950,000
Price per sqft: \$2,000
Unit type: Co-op
Room count: 6
Bedrooms: 3
Bathrooms: 3
Ceiling height: 7 feet
Description: Immediate occupancy. This four bedroom features western ...
Details: Philip House also offers cold storage, a bike storage room and a large ...
Unit features: Pets, Wifi, Park view, Balcony, Dryer, Dishwasher, Furnished, Walk-in closet, Wine cellar, Ribs, Washer, Air conditioner, Loft, Hot tub, Fireplace, Oak finish, Water front, Wine cellar, SPA, Laundry, Children's playroom, Storage

MATCHING CONTACTS

YOU HAVE 6 CONTACTS WITH MORE THAN 80% MATCH.

- Steven Hrandy | 646 123 23 67 | MATCH: 97% | NEW
- Nichole Watch | 150 463 235 | MATCH: 95% | NEW
- Elle Harley | 684 356 44 56 | MATCH: 93% | NEW
- Maria Hill | 232 456 44 33 | MATCH: 87% | NEW
- Regina rep. by Amanda Dale | Reach out | MATCH: 85% | HOT LEAD
- Represented by Robert Greendale | Reach out | MATCH: 85% | CLOSED
- Alex | Repr. by Nancy Smith | MATCH: 78% | ACTIVE
- John Trevis | 333 564 32 32 | MATCH: 75% | REBA
- Sonya Key | 545 563 22 33 | MATCH: 75% | ACTIVE

Figure 28. Screenshot of a Property Profile - Matching Section

And as a result, integrating Propertymate in the sales process decreases time spent by agents for searching properties to minutes, and in case with marketing, you can get the higher conversion and more deals without additional marketing costs.

3.2 FIRST FEEDBACK

Right after first sales to early customers, we’ve managed to receive a pleasant feedback from our early adopters.

They provided us with kind reviews on platforms like g2crowd.com, capterra.com, goodfirms.com and others.



Figure 29. Customer testimonials on Capterra.com

3.3 CASE STUDY

The Client

The client is a leading real estate development company in the USA. They oversee the creation and development of large-scale multifamily residential projects. In less than three years they developed more than 5,000,000 sq ft of residential and commercial property and helped more than 1,100 families to find a home.

The Challenge

Like many real estate organizations, they struggled to identify and access critical data around sales trends, obstacles, and ways to improve sales and marketing processes. The marketing team spent hours compiling and scheduling weekly emails to multiple (or a single) client segments. Even with smart subscriber segmentation, that is available in email marketing products like MailChimp, they cannot deliver a personalized email to each lead.

Solution

That’s when Propertymate entered the game. Our matching technology mapped buyer profiles to understand all the preferences of each contact. We integrated this solution with their listing management system and email marketing tools, and Propertymate enabled personalized email marketing to each contact to improve relevant metrics.

Results



Figure 30. Case Study Results

CONCLUSIONS

Entrepreneurship is tough.

When you are starting a new project, or trying to change the existing business, usually, you underestimate a lot of hidden things, that are invisible until you meet them in the face.

When I applied to the Lviv Business School MSTM program, I was running a business with a very similar product, but unfortunately, due to my previous mistakes, it was already dead when we started. Back then, we failed to prove a lot of critical assumptions and acted like “geniuses” - which was an even bigger mistake.

On the middle of the program, I realized that in order to scale, you need to change a lot, and this decision led me to everything that was described before.

Many things that were happening were intentionally missed in this thesis, as it could turn it in a total mess. I even caught myself on thought, that this could be not a bad book, about all pains and struggles you experience on the way of sales, fundraising, hiring, and management.

However, I decided to focus this thesis on product development and research, as I believe that this is the most impactful part of the business. You can compare it with a basement. If you failed to build a good one, you can expect your house to crush.

Main conclusions I have made while working on Propertymate are:

- Start on the market you want to work on.
And this market should be big. One of the reasons why we realized that the previous product has no future - was the glass ceiling we felt every time, we were trying to get higher.
- Sell it first.
While building products is great, we are still here to do business. Even the greatest product worth nothing, if you don't know how to sell it.
- Find the real (hidden) value your users want to get

Sometimes what clients say, and what they need are two different things. Interviews were super helpful to uncover this.

- Make sure, people in your team want to do the same thing as you. My great team did not have a lot of attention in this thesis, but we would not be able to accomplish anything without each other.

Back to beginning, the basis of the thesis was defining and proving five core assumptions. We proved all of them, but now we have new questions:

How big can it get?

Do we have the right team to turn it into a billion-dollar company?

What is our role in a global future of real estate?

We don't know for sure yet. But no one knows better than we do.

So, the only way is to keep going and watch where this journey will bring us.

GLOSSARY OF TERMS

In this section you can find references to some abbreviations used in this thesis research.

The list of important terms includes:

1. **AI** - refers to Artificial Intelligence
2. **ARELLO** - refers to The Association of Real Estate License Law Officials
3. **CRM** - refers to Customer-relationship management system
4. **NAR** - refers to The National Association of Realtors, whose member brokers are known as realtors.
5. **NYC** - refers to New York City
6. **ICP** - refers to Ideal Customer Profile
7. **NPS** - refers to Net Promoter Score - a management tool that can be used to gauge the loyalty of a firm's customer relationships.
8. **FOMO** - refers to fear of missing out
9. **CMO** - refers to Chief Marketing Officer
10. **CIO** - refers to Chief Innovation Officer
11. **MRR** - refers to Monthly Recurring Revenue, or very simply a measure of your predictable revenue stream.
12. **ARPA** - refers to Average Revenue Per Account
13. **CTR** - refers to Click-through rate - ratio of users who click on a specific link to the number of total users
14. **MLS** - refers to multiple listing service
15. **API** - refers to application programming interface
16. **UI** - refers to User Interface
17. **MVP** - refers to minimum viable product -a product with just enough features to satisfy early customers, and to provide feedback for future product development.
18. **DIY** - refers to Do It Yourself.

LIST OF REFERENCES

1. CONSUMER HOUSING TRENDS REPORT 2017
https://wp.zillowstatic.com/31/ZG_CHTR_2017_FINAL-53c1e5.pdf
2. The Zillow Group Report on Consumer Housing Trends
<https://www.zillow.com/research/zillow-group-report-2016-13279>
3. Trends in the world's largest asset class by HSBC
https://internationalservices.hsbc.com/content/dam/hsbcis/sh/HSBC_Global_Real_Estate_Report_July2017.pdf
4. Total Value of All U.S. Homes: \$31.8 Trillion. How Big Is That?
<https://www.zillow.com/research/total-value-homes-31-8-trillion-17763/>
5. Quick Real Estate Statistics by NAR
<https://www.nar.realtor/research-and-statistics/quick-real-estate-statistics>
6. United States Census Bureau Report
http://thedataweb.rm.census.gov/TheDataWeb_HotReport2/econsnapshot/2012/snapshot.html?NAICS=531210
7. Real Estate in a Digital Age
<https://www.nar.realtor/sites/default/files/reports/2017/2017-real-estate-in-a-digital-age-03-10-2017.pdf>
8. The Business Model Ontology: A Proposition in a Design Science Approach. Front Cover. Alexander Osterwalder. 2004 - 169 pages.
9. PropTech 101: Turning Chaos Into Cash Through Real Estate Innovation. Aaron Block 2019 -213 pages
10. Sell It Like Serhant: How to Sell More, Earn More, and Become the Ultimate Sales Machine. Ryan Serhant. 2018 - 219 pages

