



CA472: Enterprise Computing Team Project 19/20
<https://rentspot-dot-rentspot-274921.nw.r.appspot.com>



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Plagiarism Statement

Final Year Project submitted to Dublin City University, School of Computing for module CA472 Enterprise Computing Team Project, 2019/2020.

I understand that the University regards breaches of academic integrity and plagiarism as grave and serious. I have read and understood the DCU Academic Integrity and Plagiarism Policy.

I accept the penalties that may be imposed should I engage in practice or practices that breach this policy. I have identified and included the source of all facts, ideas, opinions, viewpoints of others in the assignment references. Direct quotations, paraphrasing, discussion of ideas from books, journal articles, internet sources, module text, or any other source whatsoever are acknowledged and the sources cited are identified in the assignment references.

I declare that this material, which I now submit for assessment, is entirely my own work and has not been taken from the work of others save and to the extent that such work has been cited and acknowledged within the text of my work.

By signing this form or by submitting this material online I confirm that this assignment, or any part of it, has not been previously submitted by me or any other person for assessment on this or any other course of study. By signing this form or by submitting material for assessment online I confirm that I have read and understood DCU Academic Integrity and

Plagiarism Policy (available at: <http://www.dcu.ie/registry/examinations/index.shtml>)

Name(s): Maksims Kompanijecs, Matthew Farrelly

Date: 17/05/2020



Organisation / Motivation / Executive Summary

Executive Summary

This final year project delivery has been written and developed by Maksims and Matthew, two final year Enterprise Computing students from Dublin City University. This report contains technical delivery and associated business cases for a new service called RentSpot. This service is a property rental web application that incorporates the latest technology and looks to digitise the application process that comes with applying for a property. The main goal with this business idea is to make property rental easy and convenient and offer tenants and landlords a safe and secure environment to rent and let properties.

We aim to achieve this by creating a property rental platform that allows tenants and landlords to create user profiles. This will allow landlords to list properties for long-term rental and allow tenants to apply for these properties through the platform. Tenants will have the ability to update their profiles with relevant information such as PPS number, previous landlord references, employment references, personal identification documents, payslips, bank statements, evidence of residency or any other relevant information that can assist them in obtaining the lease. Once applications have been made by tenants, it will provide the landlord with a way to manage the list of property applications that they have received. Landlords can view profiles of the applicants and see any relevant information that they have provided. From here, they can choose to arrange a viewing with a possible tenant. Tenants can choose to add a ‘guarantor’ to their profile if they are unable to meet the criteria that has been set out by the landlord.

RentSpot eliminates the need of landlords to cipher through application emails, calls and texts to find suitable tenants. For tenants, it suppresses the need for forward and back emailing regarding availability. All in all, this platform would save time and effort for both sides as it tries to digitize the property rental viewing application process.

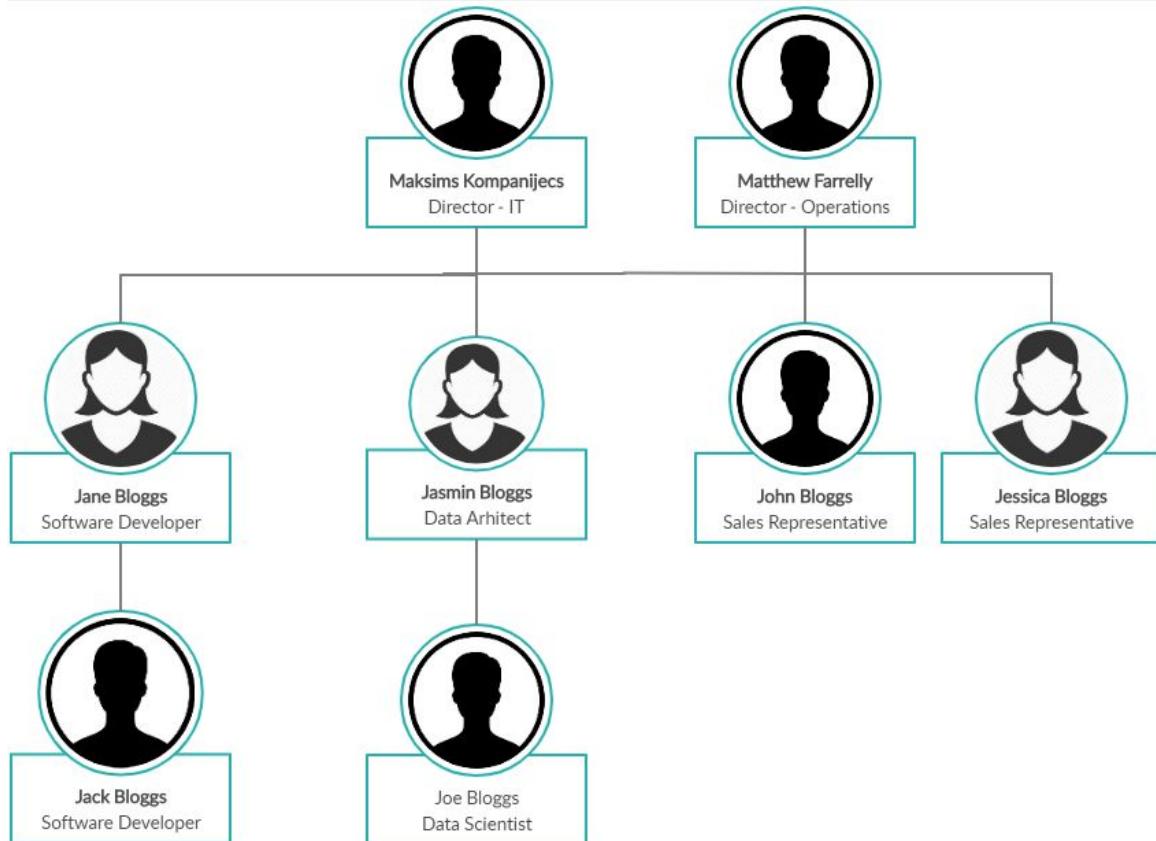
We aim to generate revenue by getting landlords onboard with our service and having them using our platform to advertise their properties. Landlords will be charged a fee per every property listed with RentSpot and they can also avail of RentSpot viewing hosting service. We have also chosen to apply a small charge to tenants using our property listing platform upon application to a viewing. Tenant users will have a balance in their account which they can top up to access more property viewing applications.



Management Report

Proposed Organizational Structure

RentSpot is a company co-founded by Maksims Kompanijecs and Matthew Farrelly and the following is a three year proposed organizational structure.



Two **software developers** will be hired in Year 1 and 2 respectively. Main responsibility includes:

- research, development, building and maintaining a business solution that will allow RentSpot to meet it's business needs.

Two **sales representatives** to be hired in Year 1 and 2. Main responsibility includes:

- Onboarding of new customers and building and maintaining of business relationships to ensure future sales

Database architect to be hired in Year 1. Main responsibility includes:

- Management of businesses' database solutions and models to store and retrieve company data

Data scientist to be hired in Year 3. Main responsibility includes:

- Interpretation of company data and to develop and enhance data driven business solution

Team CV's

Refer to Appendix A - Matthew Farrelly

Refer to Appendix B - Maksims Kompanijecs

Blogs

<https://blogs.computing.dcu.ie/wordpress/maksimk2/>

<https://blogs.computing.dcu.ie/wordpress/farrem68/>



Time Management

Semester 1 timeline

		RentSpot Semester 1 Timeline		
Time period	Week	Task	Matthew	Maksims
23/09 - 29/09	1	Brainstorm project ideas	✓	✓
23/09 - 29/09	1	Finalize project idea	✓	✓
23/09 - 29/09	1	Finalize supervisor	✓	✓
30/09 - 06/10	2	First draft of BMC, VPC	✓	✓
07/10 - 13/10	3	First supervisor meeting	✓	✓
14/10 - 20/10	4	Fork GitHub Repo	□	✓
21/10 - 27/10	5	Market Research for Idea Proposal	□	✓
28/10 - 3/11	6	Keep on top of blogs	✓	✓
28/10 - 3/11	6	Wireframe initial design	✓	□
28/10 - 3/11	6	Technology research	✓	✓
28/10 - 3/11	6	Proposed timeline design	✓	✓
4/11 - 10/11	7	Technical Delivery for Idea proposal	□	✓
4/11 - 10/11	7	Idea Proposal Submission, Presentation preparation	✓	✓
11/11 - 17/11	8	Brainstorm name ideas	✓	✓
11/11 - 17/11	9	Idea Proposal Presentation prep	✓	✓
18/11 - 24/11	9	Attend Idea Proposal Presentation	✓	✓
25/11 - 1/12	10	Financial plan draft	□	✓
02/12 - 08/12	11	Idea Proposal feedback discussion	✓	✓
02/12 - 08/12	11	Revise BCM and VPC based on feedback	✓	✓
02/12 - 08/12	11	Meeting with Jane to discuss workload over Christmas break	✓	✓
9/12 - 15/12	12	Wireframe design complete	✓	□
9/12 - 15/12	12	Exam study	✓	✓
15/12 - 21/12	-	Mid-term delivery doc start	✓	✓
29/12 - 04/01	-	Mid term delivery work	✓	✓
05/01 - 18/01	-	EXAM PERIOD	✓	✓
19/01 - 26/01	-	Mid term delivery - revised business case and tech research	✓	✓
19/01 - 26/01	-	Initial Software Architecture	□	✓
19/01 - 26/01	-	Mid term delivery - functional spec	□	✓

Semester 2 timeline

		RentSpot Semester 1 Timeline		
Time period	Week	Task	Matthew	Maksims
27/01 - 02/02	1	Submit mid term delivery	✓	✓
27/01 - 02/02	1	Initiate Django project	□	□
27/01 - 02/02	1	Login and Logout functionality	✓	□
02/03 - 08/03	2	User profiles functionality	✓	✓
10/02 - 16/02	3	Create listing functionality	✓	□
10/02 - 16/02	3	Supervisor meeting - show dev	✓	✓
10/02 - 16/02	3	Ethics form	✓	✓
17/02 - 23/02	4	Market Research	□	✓
17/02 - 23/02	4	Interview 2 Landlords	✓	□
24/02 - 01/03	5	Proposed DB schema	✓	□
02/03 - 08/03	6	Finalize Market Research Questionnaire	✓	□
02/03 - 08/03	6	Supervisor meeting - questionnaire, DB schema	✓	✓
09/03 - 15/03	7	Deployment technology research	□	✓
09/03 - 15/03	7	Initial Delivery feedback - revise idea	✓	✓



16/03 - 22/03	8	Purchase rentspot.ie	<input type="checkbox"/>	<input checked="" type="checkbox"/>
16/03 - 22/03	8	Send off questionnaire - social media	<input type="checkbox"/>	<input checked="" type="checkbox"/>
16/03 - 22/03	9	Zoom supervisor meeting	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
16/03 - 22/03	9	Analyze questionnaire responses	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
16/03 - 22/03	9	Final Delivery doc start	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
30/03 - 05/04	10	Property applications functionality	<input type="checkbox"/>	<input checked="" type="checkbox"/>
30/03 - 05/04	10	Tenant reviews functionality	<input checked="" type="checkbox"/>	<input type="checkbox"/>
30/03 - 05/04	10	Bootstrap integration	<input checked="" type="checkbox"/>	<input type="checkbox"/>
30/03 - 05/04	10	Display property applications in landlord portal functionality	<input checked="" type="checkbox"/>	<input type="checkbox"/>
06/04 - 12/04	11	Property detail functionality update	<input checked="" type="checkbox"/>	<input type="checkbox"/>
06/04 - 12/04	11	User type selection upon registration functionality	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
06/04 - 12/04	11	User profile update form functionality	<input checked="" type="checkbox"/>	<input type="checkbox"/>
06/04 - 12/05	11	Proposed software architecture + functional specification	<input type="checkbox"/>	<input checked="" type="checkbox"/>
06/04 - 12/06	11	Business Case start - Final Delivery	<input checked="" type="checkbox"/>	<input type="checkbox"/>
06/04 - 12/07	11	User type portal functionality	<input checked="" type="checkbox"/>	<input type="checkbox"/>
06/04 - 12/08	11	HTML pages formatting using CSS	<input checked="" type="checkbox"/>	<input type="checkbox"/>
13/04 - 19/04	12	Website theme update	<input checked="" type="checkbox"/>	<input type="checkbox"/>
13/04 - 19/04	12	Schedule viewings functionality	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
13/04 - 19/04	12	Search functionality attempt	<input checked="" type="checkbox"/>	<input type="checkbox"/>
20/04 - 26/04	-	Search functionality using filtering	<input type="checkbox"/>	<input checked="" type="checkbox"/>
20/04 - 26/04	-	Integration with AWS S3 - file storage	<input type="checkbox"/>	<input checked="" type="checkbox"/>
20/04 - 26/04	-	Integration with CloudSQL - database	<input type="checkbox"/>	<input checked="" type="checkbox"/>
20/04 - 26/04	-	Deployment using App Engine	<input type="checkbox"/>	<input checked="" type="checkbox"/>
20/04 - 26/05	-	Add A Guarantor' feature	<input checked="" type="checkbox"/>	<input type="checkbox"/>
20/04 - 26/06	-	Tech Delivery work	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
20/04 - 26/06	-	Business Case work	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
27/04 - 03/05	-	Manage My Property' functionality start	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
27/04 - 03/05	-	Multiple images per property functionality	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
04/05 - 10/05	-	Old and new property applications functionality	<input type="checkbox"/>	<input checked="" type="checkbox"/>
04/05 - 10/05	-	Last application fixes, removing unnecessary code etc	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
04/05 - 10/05	-	Web application testing	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
04/05 - 10/05	-	Code comments	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
04/05 - 10/05	-	Final document work	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
11/05 - 16/05	-	Final document work	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Fig. Semester 2 project timeline



Business Case

Product Description

RentSpot is a digital property rental platform, which is geared towards fast tracking and digitizing the house viewing application process that comes with property rental. RentSpot allows its customers to register a ‘profile’ either as tenant or a landlord.

Landlords will create property rental listings with specific tenancy requirements such as previous landlord references or employment references. Landlord will have to pay a small charge for every property that he lists on our platform.

Tenant users that meet these requirements will have the ability to apply for these listings. Tenants can choose to update their RentSpot profiles with relevant information such as PPS number, previous landlord references, employment references, personal identification documents, payslips, bank statements, evidence of residency or any other relevant information. When a tenant looks at the property listing that, they will be told whether they meet the requirements to apply for this property or not. If they don’t meet the requirements they will be told to update their profile and told explicitly what tenancy requirement they don’t meet. Tenants can also avail of dynamic search functionality that allows them to narrow down their search even further. Tenant customers can add a guarantor to their tenant profile, guarantor can even further assist them with their application. If a tenant meets all of the requirements set out by the landlord, they can apply for a property viewing with a click of a button.

Tenants can see all the properties they have applied through their portal. Landlords will receive all the applications that they receive through their portal. Landlords can review all the tenants that apply for their listings and can choose to schedule a viewing. Once viewing is created a record is kept in the landlord's portal and a copy is sent to the tenants portal with property viewing details.

The idea behind this is to manage the amount of applications made to a property so the landlord is not bombarded with emails and calls about the property. This will also only allow tenants that meet the requirement to apply for the properties viewing, which will in turn remove the pain of candidates not meeting the minimum requirements after a viewing has taken place.

Value Analysis

RentSpot would offer many benefits to our customers - landlords that are looking to lease out their properties and tenants who are looking to acquire a lease on a property. We feel like our business model keeps both of our customer segments in mind and benefits each other in different ways. The most important benefit that RentSpot has to offer to both parties is the fast tracking of the property viewing application process.

For the landlords of RentSpot we have offered a method of digitizing the property viewing process by collecting the required document material from our tenants that are usually requested during property viewings. These documents are available to the landlord to see through the tenant profile once the

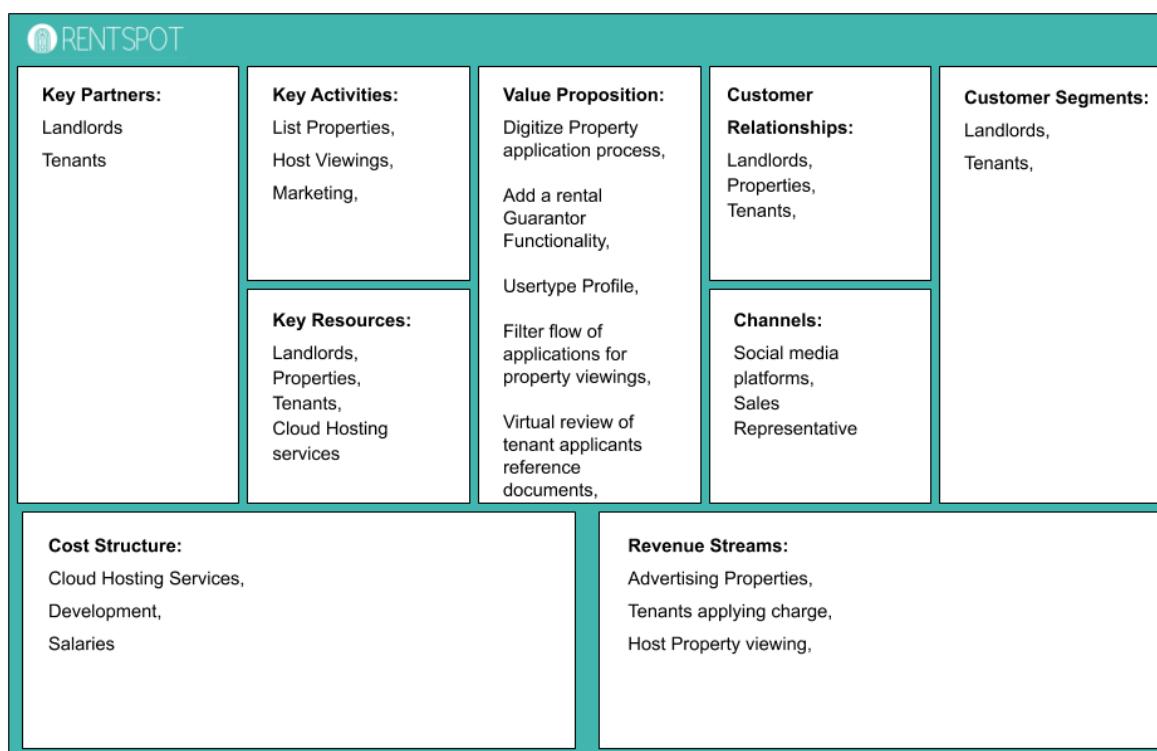


tenant applies for their listing. This allows the landlord to screen potential tenants, ensuring that they meet all of the requirements specified in the listing of the property. After the landlord has reviewed the tenant profile, they have an option to schedule a viewing with the applicant. This means that the entire process can be carried out on RentSpot where all applications and viewing appointments will be easily accessible via the landlord portal. Giving landlords the ability to set tenancy requirements will also eliminate any applications from tenants that don't meet the requirements.

One of the major benefits that RentSpot offers tenants a platform where tenants can only apply for properties that they meet all the requirements on. This will limit the amount of viewings that tenants will go to and not meet the tenancy requirements. Tenants can use the 'Add a Guarantor' feature to their advantage. This allows a tenant to link a guarantor to their tenant profile which will allow them to broaden the spectrum of the property search. This is a major benefit for tenant users of our platform as this allows individuals with lower incomes and students to apply for properties.

Tenants can also benefit by looking at previous property landlords and landlords can look at tenant reviews that have been left by other landlords. We believe this will promote honesty and transparency on the RentSpot platform.

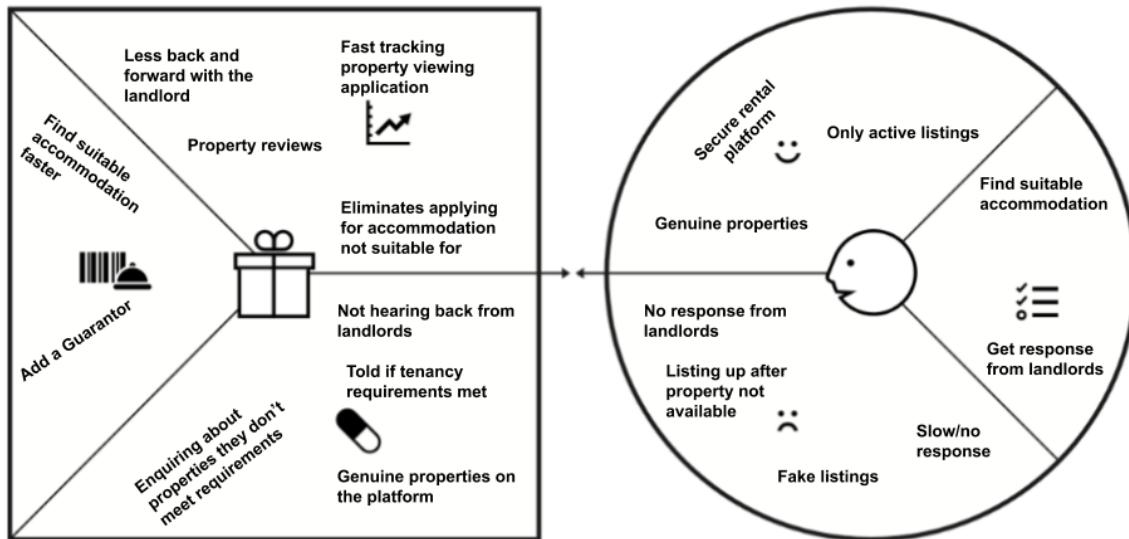
Business Model Canvas



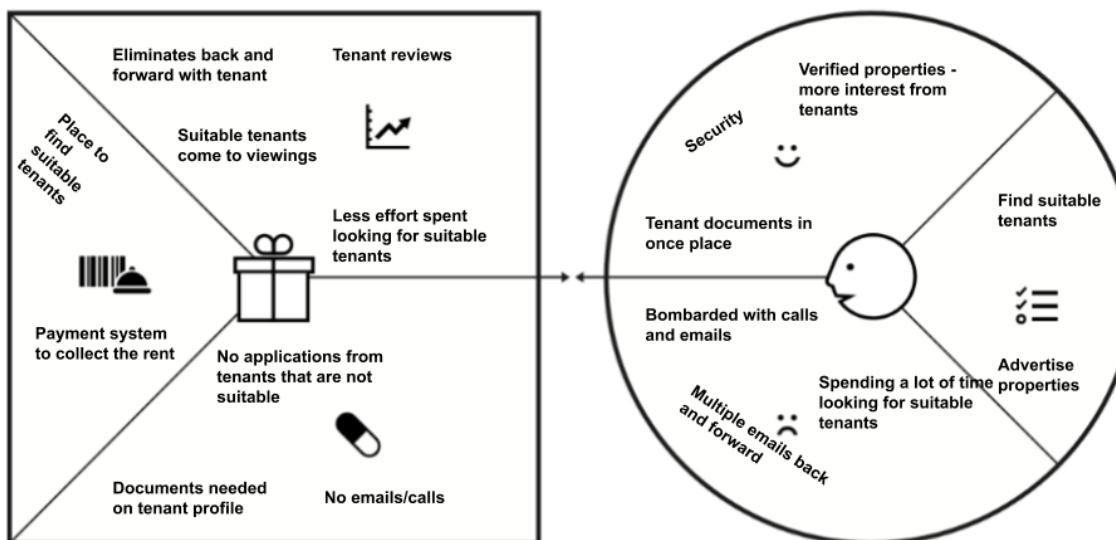


Value Proposition Canvas

Tenant



Landlord



Market Analysis

Proposed Market

Market that RentSpot is looking to target is within the property rental industry in Ireland. According to Residential Tenancies Board annual 2018 report there were around 338,890 registered tenancies with 539,253 tenants and 173,197 landlords.^[1] We hope to place high emphasis on targeting the Dublin property rental market when RentSpot is launched. In Q4, 41.9 percent of total tenancies that were registered in Ireland were registered in the capital.^[2] After building up a solid customer base in Dublin, we hope to expand within other major cities in Ireland.



Irish property rental market is booming and doesn't seem to show any signs of decline. However, taking into account all of the rental market nationwide in Ireland, it can be seen that for the first time since 2012 the rent prices have not risen nationally given the previous three month period.[4] At the start of 2019, there were around 356,000 properties privately rented in Ireland. An increase of 15,000 can be seen from the same period as last year.[3] One of the key drivers behind high numbers of new tenancies within Ireland is the continuation of total numbers of employed within the country, particularly large numbers of non-Irish workers.[3]

Our Serviceable Available Market(SAM) includes any landlord or tenant within the Republic of Ireland that could potentially use our service. Our business model is being set up to service around a total of 2% registered tenancies including landlords and tenants. Three percent of total market equals to around 7000 registered tenancies, 11000 tenants and 3500 landlords a year using our service in the first year of business.

Key Value Propositions

RentSpot offers a service that makes the process of listing and applying to properties for tenancy quicker and easier than other traditional property rental services in Ireland. RentSpot looks at the idea of creating tenant and landlord profiles that must be verified by a government issued ID to ensure transparency on the platform. Having implemented this feature it should eliminate any phishing or scam listings and ensure that there are only genuine properties and users on RentSpot.

Landlords that list properties with Rentspot will have the ability to set tenancy criteria on the properties that they list. Using this tenancy condition criteria we will filter the flow of applications to the listing by only allowing tenant users that meet the criteria apply for a viewing. This will work in favor of both of our customer segments as it will save both landlords and tenants time by only scheduling viewing with tenants that meet the tenancy criteria. The criteria that landlords can set on their listings includes - previous landlord and current employment references, salary conditions and whether House Assistance Payment (HAP) tenants can be accepted to the property. Once the advertisement is created the listing will be live and ready for applications.

Tenants have the ability to update their RentSpot profiles with relevant information such as PPS number, previous landlord references, employment references, personal identification documents, payslips, bank statements, evidence of residency or any other relevant information that can assist them in obtaining the lease. This information is then used against the conditions that have been set by the landlord for their property. RentSpot hopes to fast-track the lease application process by digitizing the supporting documentation uploaded by tenants. Tenant profiles can also contain tenant reviews that have been left by other landlord RentSpot users after a tenancy. We believe that displaying tenant reviews and relevant supporting documentation in tenant profiles will help landlords find tenants that fit their listed property. This helps to manage tenant users expectations when applying for property viewings applications.

Properties that are listed on RentSpot can be applied for a property viewing by tenants with a small message. The applications made to the properties will be set against the criteria defined by the landlord. For tenants that don't meet criteria for a property listing, RentSpot will display alerts indicating the user of their missing criteria and direct them to update their profile. This will control the flow of applications that are made to a property listing and eliminate any applications that don't meet the criteria set out by the landlords. These features will further enforce transparency throughout



RentSpot. After a property has been leased by the landlord we ask them to enter the tenant they have selected and store the dates of the tenancy agreement with us. We use this information so properties that are re-listed on RentSpot can be reviewed by previous tenants.

Tenants that find their desired properties but fail to meet the criteria set by the landlord can add a Guarantor to their profiles. Tenants can add a guarantor to their profile by filling out a form and uploading the required documents which will include guarantor agreement and proof of employment. Tenants adding a guarantor to their profile allows them to broaden the range of properties in which they can apply for a viewing. We also feel that by adding this it will help landlords put their mind at ease when renting out their properties ensuring that their property, and rent is covered.

Customer Segments

RentSpot's business idea is targeted at landlords and tenants within Irish property rental market. For tenants we hope to make applying for properties viewings much quicker and more convenient - giving most of the necessary information to the possible landlord with a click of a button. From the landlord's point of view, we hope to make RentSpot the place for landlords for advertising their properties and finding suitable tenants that meet their requirements with ease.

We have spotted a gap in the market and some common pains can be seen for both customer segments when using traditional property rental services. From the tenant point of view, trying to find suitable accommodation in Ireland can be a monotonous task. A common occurrence for tenants within Irish property rental market is to reach out to a listing owner for a viewing by phone or email. Most of the time to receive no acknowledgement of application confirmation, leaving the tenant waiting and wondering when they will receive the call for the viewing. Another common occurrence for tenants is to be called for a property viewing and not meeting the requirements that were set out by the landlord. It is very common within Irish property rental market for landlords to receive an overwhelming number of enquiries about the property that they have listed.

Key Resources

To go into full production a team of skilled technology experts is required that will be responsible for developing, building and maintaining a business solution that will allow RentSpot to meet it's business needs. This would involve hiring software developers that would build the software tailored towards business needs. Database architects to manage data behind the business and data scientists who can leverage the data collected and help make better business decisions.

The need for cloud infrastructure behind the business is also an important resource as we will be using cloud solutions to host both our application and database and other vital resources. Once we have the application developed and hosted in the cloud it allows RentSpot to carry out it's business operations and provide business value to it's customer over the internet.

Landlords are another vital key resource that's required in order to get RentSpot off the ground. Landlords will be responsible for listing their vacant properties on our platform. In order to try onboard as many as possible landlords using our service, we will be looking to hire a sales representative to promote RentSpot's services and help advertise the brand. In order to make RentSpot a household name we will harness the power of advertising using different social media channels by posting regularly and further trying to achieve online presence for our brand. As our online presence grows we expect our tenant number of users to grow as they become aware of the services that RentSpot offers through different social media channels and advertising campaigns.



After we have gathered a tenant population on our application the next thing we require is their data that will include relevant documents that are required to get a lease on the property.

Data that tenants upload to RentSpot is seen as a key resource as it is necessary to digitise the property viewing process. From the data that has been provided by tenants users, we can build their profile and base their property search on criteria that has been added to their profile by uploading the supporting documentation.

Revenue Streams

In RentSpot we will adopt a pay per use approach for both our customer segments. RentSpot will generate the most revenue through our landlord customers by listing their advertisement on our platform. We have decided that placing an advertisement with RentSpot will be set at a flat rate of €50 per advertisement. All our advertisements will have one format and will remain an active listing until the property has been listed. The cost of listing a property on our platform will be 16 percent cheaper than listing with our leading competitor ‘Daft.ie’

Landlords can avail of a feature where a member of RentSpot hosts the property viewing. This service would cost €120 per viewing day. As RentSpot grows we will subcontract this service to people that will host property viewings on our behalf.

We will also be generating revenue from our tenant customer base, although it will not be in as big quantities we expect that the volume of applications will help generate an additional amount of revenue. We plan to use a balance system for our tenant account in which they must top up with credit to create a property viewing application. RentSpot will charge its tenant user a small charge of €0.50 per application to a property for a viewing. We expect that this will make us between 10% and 30% additional income of listing a property. In turn this will mean that a property that is listed on RentSpot will generate between €55 and €65.

Key Activities

To bring RentSpot to the market it will require us, the directors to take action in seeking the available grant for new start up businesses. Given the assumption that we have been successful in obtaining the start-up grant we will then seek people with the appropriate skills necessary to fill the roles we require. This will include networking and creating job specifications to be advertised for people to fill these roles that are required. Once we have acquired the RentSpot team and our application is in development, we will start to launch online and physical advertising campaigns to help create a household feel to ‘RentSpot’ to help onboard new clients with the help of our sales representative. We will carry out this physical campaign in the major cities in Ireland and the online campaign using Facebook's marketing strategy. Once the application has been developed and is ready for the market we will ensure that we have a sufficient number of properties listed with RentSpot for our tenant users to browse on our listing page. After RentSpot has been deployed we will continue with a strong online marketing campaign and maintenance of the application.

Industry Trends

Irish rental market has been in a difficult place for the last couple of years. Over the last couple of years there has been a major lack of supply that can't keep up with the high levels of demand, therefore since 2012 prices have been steadily going up in line with the demand[4]. There have been some interesting industry trends observed within the industry year on year. In Quarter(Q4) 2019, 85



percent of registered tenancies were new registrations, however average rent price was greater for renewal tenancies when compared to new tenancies in Q4 2019. [2]

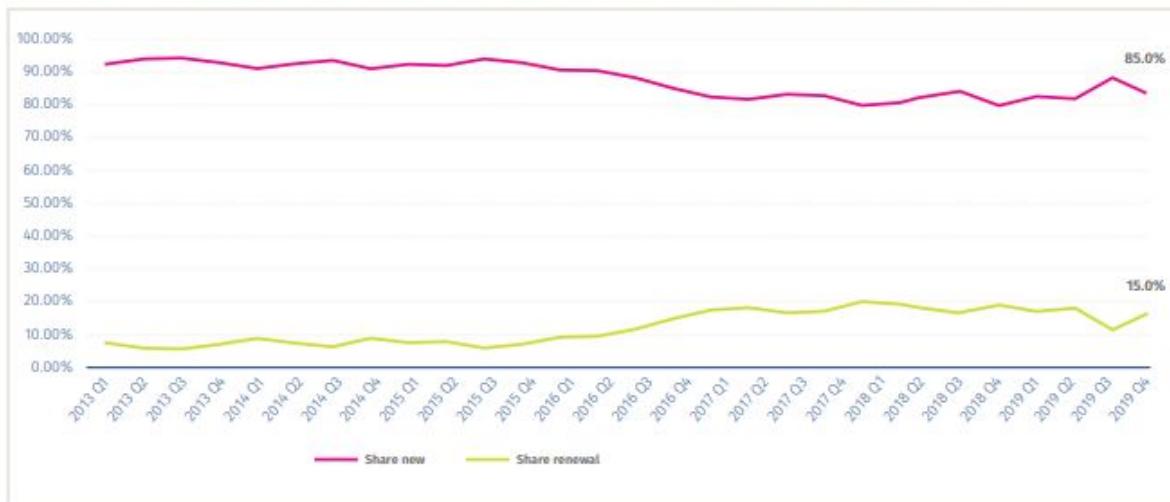


Fig. Share of new vs renewal tenancies in 2018[2]

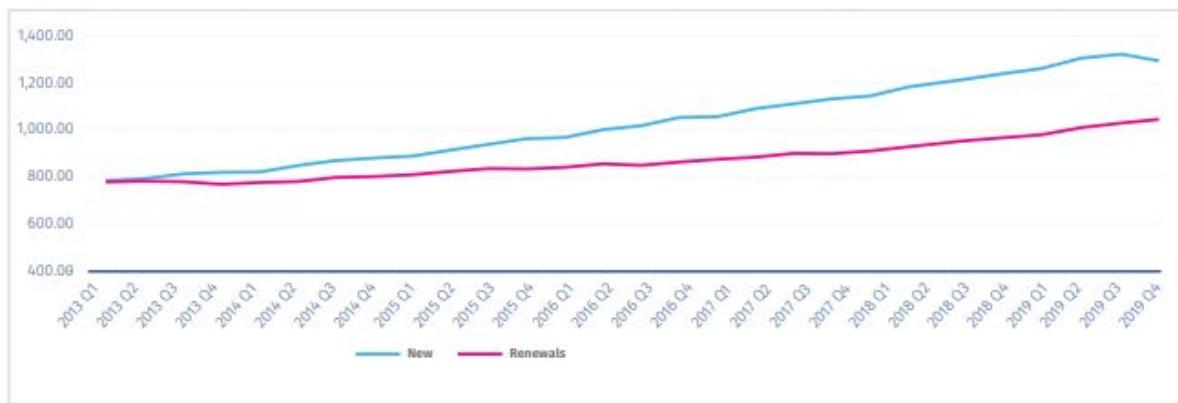


Fig. Average rent prices for new vs renewal tenancies in 2018[2]

New restrictions came in place during June 2019 for short term lettings in rent pressure zones. Under these new restrictions property owners that solely used their properties to be rented on short term letting sites like AirBnB, will have to apply for new planning permission for that property to be listed as a short term rent space. [7]“Just 3% of thousands of eligible Airbnb properties have registered under new rules or applied for special planning permission. We believe that this will have a positive impact on the amount of properties returning to the long term rental market and the need for a more interactive application to advertise new vacant properties.

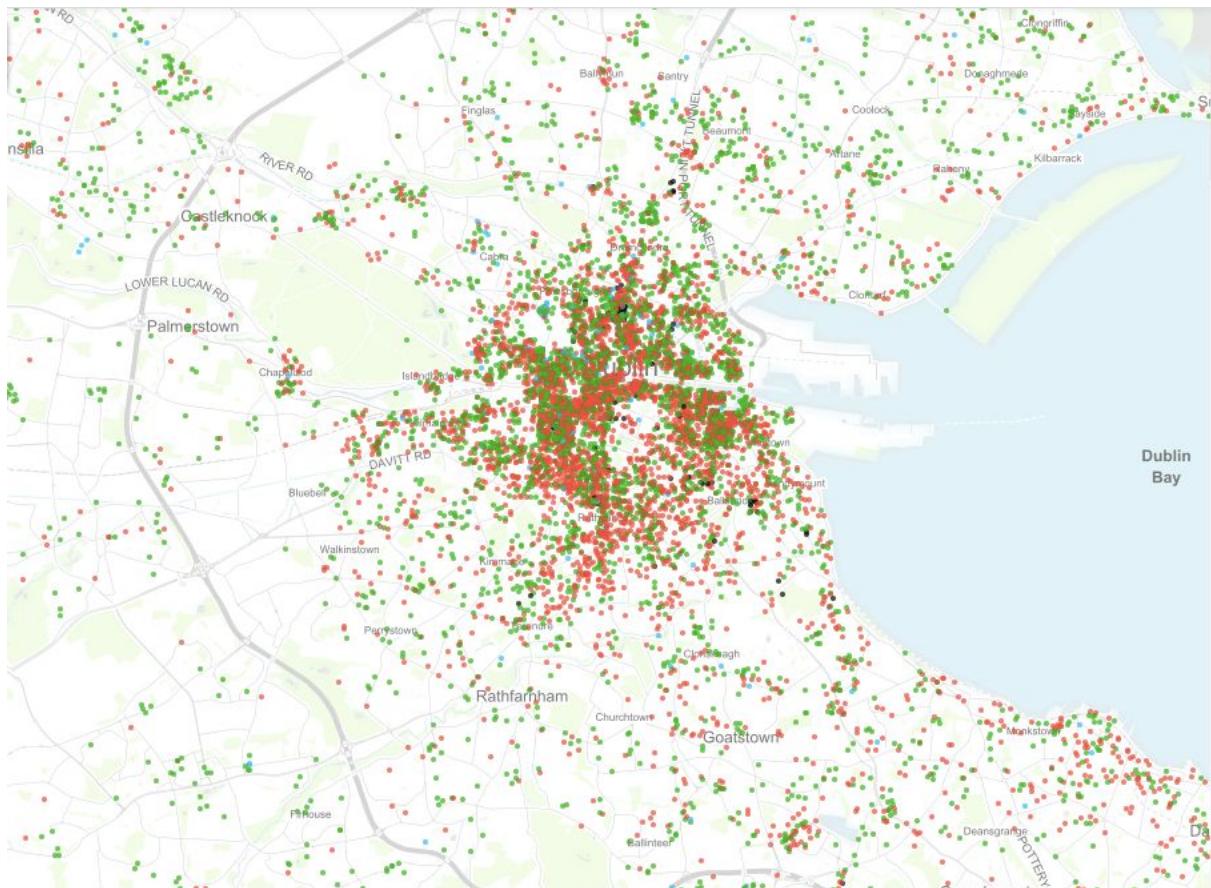


Fig. AirBnB listings in Dublin, 26 November 2019[8]

Since COVID-19 pandemic has caused a drastic change in rental supply across Ireland. According to the latest report released by Daft, they have seen a large surge in the number of properties to rent listed on their site.[6] The number of properties to rent in Central Dublin since the school closure the week of 15th of March are above by 75% than the same period last year.[6] However, the week by week figures are showing that the surge is dying down. Even though there were 75% more houses listed in Central Dublin the week of March 15th, in the week of April 5, there were only 16% more properties put up for rent in Dublin. [6] The rest of Dublin had seen small increase in property rental listings of 24% in the same week schools closed, but saw 16% less by the week 5th of April.[6] Outside Ireland, global pandemic hasn't impacted supply and demand too much.

The figures in Q1 2020 Rental Price report also suggest that how the start of COVID-19 has impacted on rental prices, with April 2020 rents being down 2.1% compared to those in March 2020.[9] Rents are still higher much higher than a year ago, but for the rest of the year it's looking like rent prices should decrease as unemployment is on the rise due to the effect of COVID-19 pandemic.

Chosen Pricing Model

Our pricing model for RentSpot is influenced by the models of our main competitors, Distilled Media and MyHome pricing models. For all the mentioned platforms listing an advertisement has different premiums which offer some additional features by the platform. Daft which is the leading property rental platform in Ireland offers three different advertisement types, which give the user additional features at different rates.



The opening rate to list an advertisement with Daft.ie is €59 per listing, which lists the advertisement for 90 days, allows you to download a generic rental contract and lists the advert on other Distilled Media platforms. The Premium advertisement type includes the above mentioned features along with listing on “Let.ie” and additional 90 days listing if the property is not rented, at a rate of €99. The featured advertisement type at a rate of €189 includes all the above features along with an extra large advertisement format meaning the listings images will be highlighted and appear bigger than other properties listed.

RentSpot will follow the Distilled Media pricing scheme by charging a landlord customer a fixed price to list an advertisement and availing of all RentSpots features. We have chosen to offer our service at a rate of €50 per advertisement which includes listing the advertisement until it has been leased or application quota has been met. It is also possible for RentSpot team members to hold the house viewings for landlords at €120 per day of viewings. Due to time constraints, this functionality wasn't added into the prototype that we have developed.

For tenant customers we have decided to incur a small fee of €0.50 per application for property viewing that's made. We will allow new tenant users to apply to ten properties for free upon registration once they deposit €5 into their RentSpot wallet. Illustration below outlines the chosen pricing model for RentSpot's business model.

RENTSPOT		Chosen Pricing Model	
Landlord		Tenants	
Per listing	€60	Per application	€0.50
Host viewings*	€120		

Fig. RentSpot chosen pricing model

Competitors within Irish industry

Based on secondary research, RentSpot would have two major competitors within Irish property rental industry. Distilled Media would be the main competitor for RentSpot. This company is behind daft.ie - largest Ireland's property rental service provider also operates property.ie, let.ie and rent.ie.

According to daft.ie website - “Daft is Ireland's largest property website. 9 out of every 10 properties for sale in Ireland are advertised on Daft.” Their business model consists of by offering a number one destination for mainly Irish customers for property searchers and connects them with professionals with a large numbers audience each month.[5] According to their Google Analytics data from 2017, 2.5 million unique users visit Daft every month [5] In terms of Irish property rental market their income stream consists from revenue generated from charging selected premiums on different packages when customers are looking to advertise a vacancy on their site.

These packages are offered are - Standard, Premium and Featured. The features that these packages offer are summarized below.



daft.ie Distilled Media Competitor Profile			
Advert type	Featured	Premium	Standard
Cost per listing	€189	€99	€59
Amount of days live*	90 days	90 days	90 days
Unlimited Photos	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Rent.ie listing	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Property.ie listing	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Free Rental Contract**	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
High Priority Listing	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Let.ie listing	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Lead Assurance***	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Extra Large Ad Format	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Fig. Distilled Media competitor profile

* Featured Ad - has featured status for 30 days, then it becomes a Standard Ad

Premium Ad - has premium status for 30 days, then it becomes a Standard Ad

Standard Ad - remains live on the site for 90 days.

** by placing an ad on daft, you are entitled to legally compliant rental contract template that can be signed digitally and stored online

*** if you do not receive an enquiry for your property in 90 days, you can relist for FREE

MyHome is another property rental service provider in Ireland that would be a potential competitor, which offers very similar services that are offered by Distilled Media group. MyHome also charges selected premiums on different packages when customers are looking to advertise a vacancy on their site. The features that these packages offer are summarized below.

myhome.ie MyHome Competitor Profile			
Advert type	Featured	Premium	Standard
Cost per listing	€79	€50	€30
Amount of days live***	90 days	90 days	90 days
Listing on IT	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Listing on Examiner	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Unlimited Photos	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Highlight in Search**	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Homepage Feature Ad*	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Fig. MyHome competitor profile

* Premium Ad position on the MyHome website for 1 week



- ** Highlight in Search - Ad appears on the first page of your locality search for 28 days with premium banner appearing on your ad
- *** Ad is listed for 90 days
- Competitive Advantage

RENTSPOT Profile	
Type	Standard Listing
Cost	€50
Amount of days live*	-
Unlimited Photos	<input checked="" type="checkbox"/>
Tenant/Property Reviews	<input checked="" type="checkbox"/>
Tenant Profiles**	<input checked="" type="checkbox"/>
Schedule Viewings***	<input checked="" type="checkbox"/>
Filter Applications****	<input checked="" type="checkbox"/>
Type	Host viewing*****
Cost	€120

Fig. RentSpot profile

* Listing stays live on the site until property leased/application quota met.

** Landlord can view the profiles of applicants

*** Landlords can schedule viewings via RentSpot.

****Limit the number of applicant/minimum requirements.

*****A member of RentSpots team to host your property viewing.

We believe that RentSpot has much more to offer and therefore has competitive advantage in the Irish property rental market. Any vacancy that is listed through RentSpot stays live on site until property is leased out or the application quota is met. In main competitors property rental platforms all enquiries made in regards to availability of the property are made through the phone number or email address provided with the advertisement. This can result in landlords' phones being bombarded with calls and texts about the availability of the property. Another edge that we have over the competitors in the market is the removal of the landlords personal information from the advertisement and instead allowing them to control the flow of the applications through our platform. We also feel like the landlord customers of our service will find the capability of allowing to limit the number of enquiries received that meet the tenancy requirements. The ability to view tenant profiles that contain all of their personal information is also an advantage and will allow them to fast track the viewing application process. Landlords also have the ability to schedule the viewing with the applicants through the application or avail of the service where a member of RentSpot will host the viewing with applicants.



Primary and Secondary Research Validation

While we were in the earlier stages of developing RentSpot we conducted some research into our target market to get a better understanding of the application they need and the nice to haves that could be incorporated into our app. To reach out our customer segments we created a questionnaire and had meetings with two landlords that have multiple properties in the market. We posted a link to our questionnaire on different social media platforms (Reddit Ireland, Facebook) to try and get a mix of user types to fill out our form. We also fortunately knew some landlords which made getting their opinion on what kind of web based listing service was needed for the market a lot easier.

From posting our google form on different channels we received a total of 62 responses from a mix of both landlords and tenants on their experience with the rental market. After analysing our responses we got some good insights into the common pains that tenants and landlords experience when letting a property, this opened up more ideas as to what we could add into RentSpot for into our proposed web application for business ideas.

From analyzing all the responses in our survey 85.5% percent of participants were tenants and the remaining 14.5% were landlords in the Republic of Ireland. We had previously anticipated that the response rate from landlords would be much lower than tenants that are willing to take part in the survey.

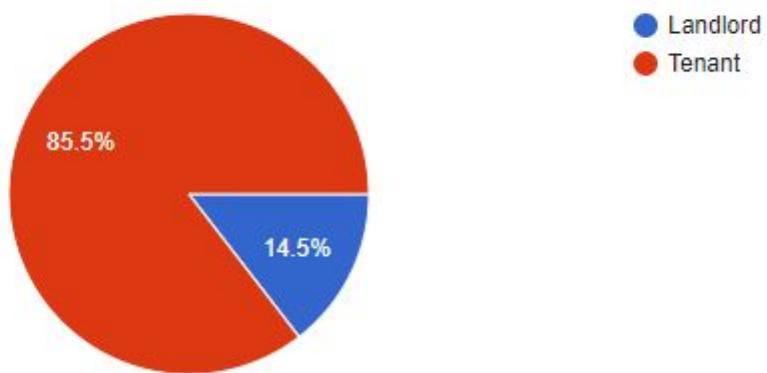


Fig. Tenant vs Landlord survey participants

Tenant Questions

- How long are you living in rented accommodation?
- Is the property that you are renting located in a rent pressure zone?
- What platform do you use to find vacant properties?
- Would you upload some personal information to help fast track your tenancy application process, given that information is stored securely? (PPS number, references, bank statements, identification etc)
- Would you be willing to pay a small charge for a service that would guarantee a property viewing?
- In your opinion, is there anything that could make the process of finding a suitable place to rent a lot easier and quicker?
- Have you ever had a dispute with a landlord in regard to a security deposit?
- If yes, how did you resolve the dispute with a landlord in regard to security deposit?



- Do you think if there was a deposit holding system in place, would you avail of this service during the properties tenancy?

Majority of tenant users that took part in the survey 47% stated that they have lived in the rented accommodation for a longer period of 5 years. This indicated that tenants would be seeking rental accommodation for more than one lease term, meaning that most likely they have had to go through multiple property viewing processes and have used property listing platforms for a substantial length of time. This further indicated the potential that RentSpot could have with having long term tenant customers that will benefit from having built a strong tenancy profile.

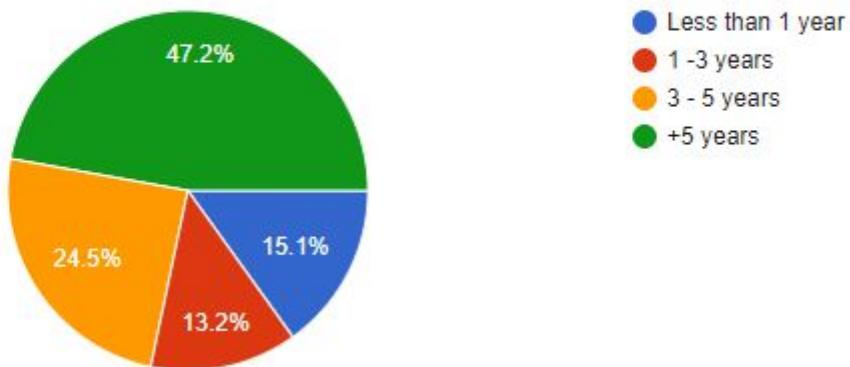


Fig. "How long are you living in rented accommodation?" survey question result

The next question we put forward to our tenants was to gather information on the areas they were renting their accommodation, if they were in Rent Pressure Zones (RPZ). Nearly 80% of tenants surveyed were renting in RPZ which are: Dublin, Cork, Galway, Limerick, Meath, Kildare, Louth and Wicklow. This showed us that a number of tenants surveyed could have faced competition when searching their rented property .

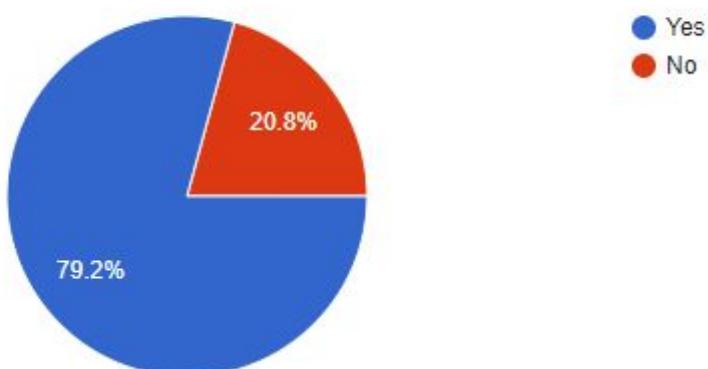


Fig. "Is the property that you are renting located in a rent pressure zone?" survey question result

We asked the tenants which listing platform they would commonly use to conduct their rental accommodation search and nearly 90 % of our participants selected 'Distilled Media Group'. It was also very clear that a very high majority of participants have or use online property rental platforms when searching for property rental accommodation.

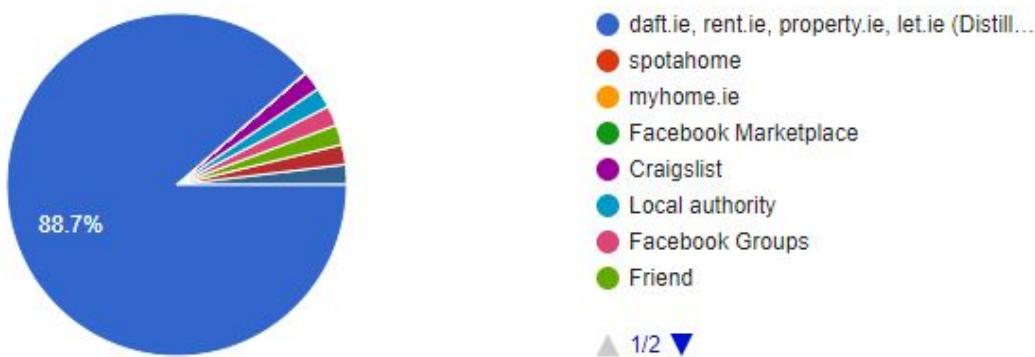


Fig. "What platform do you use to find vacant properties?" survey question result

Another question we asked our tenant target base was if they would be willing to upload some of their personal information, to help assist them in an easier property rental searching process. Unfortunately this data did not meet the expectation that we set it when creating our questionnaire, although just over half respondents voted in favor of uploading reference document material to an online profile to fast track the tenant screening process.

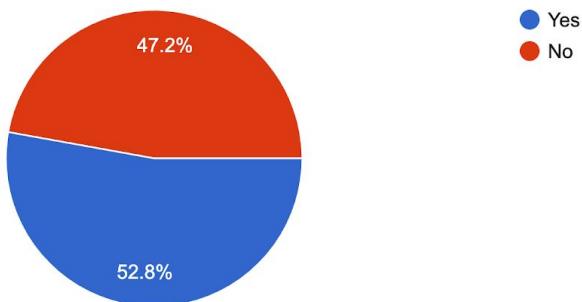


Fig. Would you upload some personal information to help fast track your tenancy application process, given that information is stored securely? (PPS number, references, bank statements, identification etc) survey question result

Tenants were also given an opportunity to provide their idyllic solution to the listing methods in place at the moment to find suitable accommodation. Some of the responses we received were in regards to the competition when going to view a house "More places to rent would help to not compete with as many people", and another suggested that a "Online process/ pre selection" would be the ultimate solution. This opened up our minds to the possibilities of what kind of a solution we could make to fit the market from the tenants perspective, we were also able to gather that tenants seemed to have a negative outlook on the current property rental process and solutions currently serving the market.

Landlord Questions

- Do you use real estate agents to let and manage your properties?
- How many properties do you have rented out?
- What platform do you currently use to advertise your properties?
- Is your property located in a rent pressure zone?
- Do you host your own property viewings for tenants?



- Would you consider hiring someone to host the property viewings for you?
- If there was a property rental site that only allowed verified users to apply for properties, would this enhance your experience of finding tenants? (identity verification)
- Would you take a tenant based on their reviews and references alone , or would you prefer to meet a tenant in person?
- In your opinion, is there anything that could make the process of finding suitable tenants a lot easier?
- Have you ever had a dispute with a tenant in regard to a security deposit?
- If yes, how did you resolve the dispute with a tenant in regard to security deposit?
- Do you think if there was a deposit holding system in place, would you avail of this service during the properties tenancy?

From all landlord participants that we surveyed 33% percent of participants used Real Estate service to list their properties on the Irish Property Rental market. This was a slight indication that finding tenants and hosting viewings is a daunting task and would much rather pay extra for a service that handles this process from start to finish.

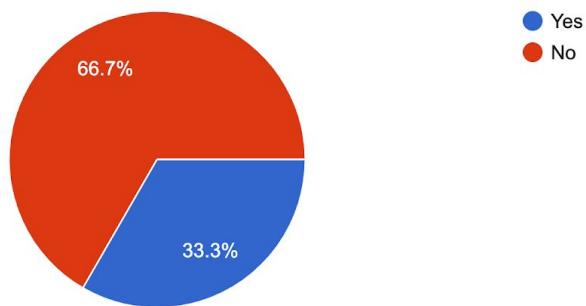


Fig. "Do you use real estate agents to let and manage your properties?" survey question result

From analyzing the response for this question it was also made clear that landlords use online property rental service platforms to find tenants for their vacant properties. Without any surprise 80% of respondents of this survey used Distilled Media Group property rental services.

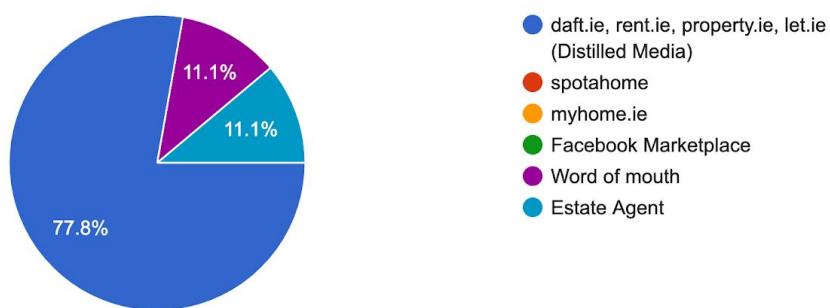


Fig."What platform do you currently use to advertise your properties?" survey question result



Next question was asked to figure out if letting verified users apply for property viewings would help them in their experience with finding tenants for their vacant property. Majority of our participants at 55% answered ‘Yes’ which means that having verified users on property rental platforms would enhance their tenant seeking experience. This is one of the questions that helps to push us towards the promotion of transparency through RentSpot’s platform only offering full functionality to verified users. This would also benefit landlord pain of the uncertainty about the identity of the tenants applying to their listing.

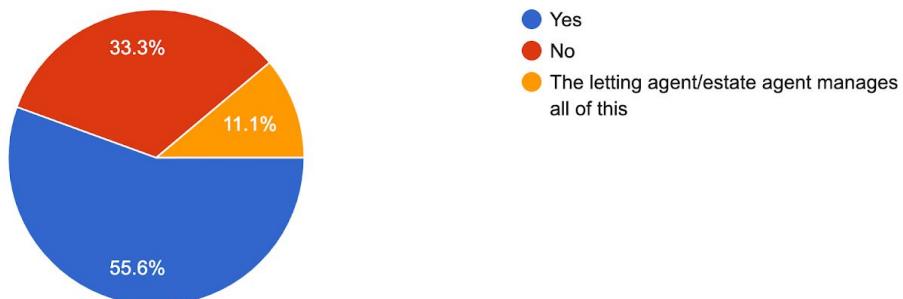


Fig. “If there was a property rental site that only allowed verified users to apply for properties, would this enhance your experience of finding tenants? (identity verification)”

We felt like it was necessary to also get the landlord point of view on if there would be a service that would be willing to lease their property to the tenant based on their references or would they like to meet the tenant in person. We felt like this was a justification to pursue our Host Viewing feature based on the responses we would get from our survey. We were somewhat surprised at the amount of responses in favour of accepting a tenant without meeting in person.

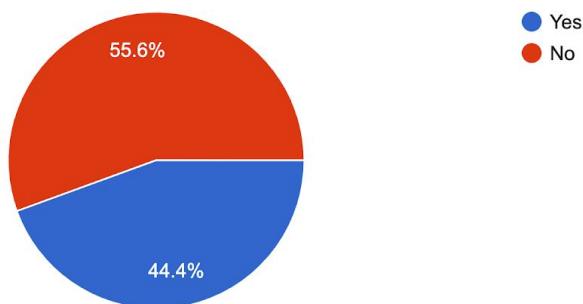


Fig. “Would you take a tenant based on their reviews and references alone , or would you prefer to meet a tenant in person?” survey question result

We also were interested in gathering landlord thoughts on any features that could make the process of finding suitable tenants easier. Responses gathered from this question felt like we were moving RentSpots business model in the right direction to satisfy both of our customer segments. We added a

We left an open form question for our landlords that were being surveyed, asking them if “In your opinion, is there anything that could make the process of finding suitable tenants a lot easier?” and some of the responses made us feel like we were moving RentSpot’s Business model in the right direction to satisfy both our customer segments. We have added features into our application to help satisfy these common recurring pains, this includes the ability to view a tenant profile that has applied for a listing to view references and reviews .



Targeted advertising e.g. min income of EUR required

Agent vets

rental track record

Yes,, credit scores

Fig. "In your opinion, is there anything that could make the process of finding suitable tenants a lot easier?" survey question result

Landlord Interviews

Prior to the coronavirus lockdown we were fortunate enough to have two meetings with the landlord that had multiple properties listed in the Irish rental market. We got to ask them some questions about their common pains when in search of tenants, the ideal listing application and what kind of services they think would be good to implement into RentSpot. Our interviews took place late February with a Landlord #1 based in Dublin who had over 20 properties in the rent pressure zone. Landlord #2 owns multiple properties across Ireland. We had described the type of application we intended to build with RentSpot and showed them some of our interface designs templates to give him a visual representation to better understand the RentSpot business idea.

Question: *What kind of features would he implement into a listing application that would make it an easier experience to lease your properties?*

Landlord #1 Answer: To have a reviewing system for both landlords and tenants, so tenants know that you will fix things quickly and we will know who if a tenant has been good. Also a track history that rates the tenant on if they make their rent payments on time.

Landlord #2 Answers: A way to only allow tenants that can afford rent payments or suit the property to apply for your listing. I often have people come to view a property that is in receipt of the H.A.P. allowance on a property that cannot be covered by the H.A.P. grant. It would also be handy to have a directory of tradesmen that could fix any problems that happen in the properties.

Question: *Would you lease your property to a tenant based on an online profile with reference documents and reviews?*

Landlord #1 Answer: No, I prefer to meet my tenants to show them the property and to introduce myself. I would like to schedule viewings with only tenants that I know can afford to pay the rent so I think having some sort of screening before applying would help.

Landlord #2 Answer: Yes I would lease my property to a tenant I haven't met before. I have property in Dublin, Galway and Donegal. It is just simply sometimes not feasible and not worth my time to meet the tenants in person. I usually lease the properties out of my catchment through listing agencies.



Question: *How do you find the volume of applications to your property listing and what is the usual method of contact?*

Landlord #1 Answer: It can be pretty excessive, sometimes I will have to remove an advert from daft within the hour to deal with the amount of enquiries. I was foolish enough to make the mistake of using my phone number with the advertisement but learned when I was still getting calls after removing the advert. I now use my email address but the level of enquiries is still sometimes too much to go through.

Landlord #2 Answer: Luckily for my properties in the Rent Pressure Zones I use listing agencies to find tenants to lease my properties. In the houses that I host viewings in and list, I find that there are a lot of calls for the property which sometimes includes pleading. My usual method of contact for these listings is over the phone and ask the tenant to bring their references with them.



Three Year Financial Projections

RentSpots' Three Year Financial Plan is available [here](#)

Cashflow for 2021

Year 1 Cashflow													
INVESTMENT INCOME	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC	YR TOTAL
New Frontiers	€ 30,000.00	€ -	€ -	€ 15,000.00	€ -	€ -	€ -	€ -	€ 10,000.00	€ -	€ -	€ -	€ 55,000.00
TOTALS	€ 30,000.00	€ -	€ -	€ 15,000.00	€ -	€ -	€ -	€ -	€ 10,000.00	€ -	€ -	€ -	€ 55,000.00
OPERATING REVENUE	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC	YR TOTAL
Property Listing - €50	€ -	€ -	€ -	€ -	€ 10,000.00	€ 12,000.00	€ 12,400.00	€ 14,000.00	€ 11,000.00	€ 7,500.00	€ 7,500.00	€ 15,000.00	€ 89,400.00
Host Viewing - €120	€ -	€ -	€ -	€ -	€ 4,800.00	€ 5,760.00	€ 5,752.00	€ 6,720.00	€ 5,280.00	€ 3,600.00	€ 3,600.00	€ 7,200.00	€ 42,912.00
Apply for property - €120	€ -	€ -	€ -	€ -	€ 1,000.00	€ 1,200.00	€ 1,240.00	€ 1,400.00	€ 1,100.00	€ 750.00	€ 750.00	€ 1,500.00	€ 8,940.00
	€ -	€ -	€ -	€ -	€ 15,800.00	€ 18,960.00	€ 19,592.00	€ 22,120.00	€ 17,380.00	€ 11,850.00	€ 11,850.00	€ 23,700.00	€ 141,252.00
MONTHLY EXPENSES	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC	YR TOTAL
Company setup	€ 226.65	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ 226.65
Marketing	€ -	€ -	€ -	€ -	€ 472.00	€ 9,580.00	€ 472.00	€ 9,580.00	€ 472.00	€ 9,580.00	€ 472.00	€ 472.00	€ 31,572.00
GDPR	€ -	€ -	€ 2,000.00	€ -	€ -	€ -	€ -	€ -	€ 1,000.00	€ -	€ -	€ -	€ 3,000.00
Travel	€ -	€ -	€ -	€ 600.00	€ 600.00	€ 600.00	€ 600.00	€ 600.00	€ 600.00	€ 600.00	€ 600.00	€ 600.00	€ 6,000.00
Domain	€ 27.45	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ 27.45
G-Suite for Business	€ 9.36	€ 9.36	€ 9.36	€ 9.36	€ 9.36	€ 9.36	€ 9.36	€ 9.36	€ 9.36	€ 9.36	€ 9.36	€ 9.36	€ 112.32
Cloud Costs	€ -	€ -	€ 320.56	€ 320.56	€ 320.56	€ 320.56	€ 320.56	€ 320.56	€ 320.56	€ 320.56	€ 320.56	€ 320.56	€ 3,205.60
Sales Rep Salary	€ -	€ -	€ 2,000.00	€ 2,000.00	€ 2,000.00	€ 2,000.00	€ 2,000.00	€ 2,000.00	€ 2,000.00	€ 2,000.00	€ 2,000.00	€ 2,000.00	€ 20,000.00
Director Salary x2	€ 4,000.00	€ 4,000.00	€ 4,000.00	€ 4,000.00	€ 4,000.00	€ 4,000.00	€ 4,000.00	€ 4,000.00	€ 4,000.00	€ 4,000.00	€ 4,000.00	€ 4,000.00	€ 48,000.00
Developer Salary	€ 2,200.00	€ 2,200.00	€ 2,200.00	€ 2,200.00	€ 2,200.00	€ 2,200.00	€ 2,200.00	€ 2,200.00	€ 2,200.00	€ 2,200.00	€ 2,200.00	€ 2,200.00	€ 26,400.00
Employee PRSI 4%	€ 248.00	€ 248.00	€ 328.00	€ 328.00	€ 328.00	€ 328.00	€ 328.00	€ 328.00	€ 328.00	€ 328.00	€ 328.00	€ 328.00	€ 3,776.00
VAT 23%	€ -	€ -	€ -	€ -	€ 3,634.00	€ 4,380.00	€ 4,506.16	€ 5,067.40	€ 3,997.40	€ 2,725.50	€ 5,451.00	€ 32,487.96	
Miscellaneous	€ 500.00	€ 500.00	€ 500.00	€ 500.00	€ 500.00	€ 500.00	€ 500.00	€ 500.00	€ 500.00	€ 500.00	€ 500.00	€ 500.00	€ 6,000.00
BURN RATE	€ 7,211.44	€ 8,957.36	€ 9,957.92	€ 10,429.92	€ 23,171.92	€ 14,790.72	€ 24,044.08	€ 16,517.52	€ 23,535.32	€ 13,155.42	€ 13,155.42	€ 15,880.92	€ 180,581.33
OVERVIEW	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	YR TOTAL
CUMMULATIVE EXPENSES	€ 7,211.44	€ 16,168.80	€ 26,126.72	€ 36,556.64	€ 59,728.56	€ 74,519.28	€ 98,563.36	€ 115,080.88	€ 138,616.20	€ 151,771.62	€ 164,927.04	€ 180,807.96	€ 1,070,078.50
CUMMULATIVE INCOME	€ 30,000.00	€ 30,000.00	€ 30,000.00	€ 45,000.00	€ 60,800.00	€ 79,760.00	€ 99,352.00	€ 121,472.00	€ 148,852.00	€ 160,702.00	€ 172,552.00	€ 196,252.00	€ 1,174,742.00
STATUS	€ 22,788.56	€ 13,831.20	€ 3,673.28	€ 8,443.36	€ 1,071.44	€ 5,240.72	€ 788.64	€ 4,391.12	€ 10,255.80	€ 8,930.38	€ 7,624.96	€ 15,444.04	€ 104,663.50

Fig. RentSpot projected cash flow for first year in business

Cashflow for 2022

Year 2 Cashflow													
INCOME	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC	YR TOTAL
Previous Year Balance	€ 15,444.04	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ 15,444.04
TOTALS	€ 15,444.04	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ 15,444.04
OPERATING REVENUE	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC	YR TOTAL
Property Listing - €50	€ 12,500.00	€ 13,000.00	€ 13,500.00	€ 15,000.00	€ 14,500.00	€ 15,500.00	€ 15,000.00	€ 17,500.00	€ 18,750.00	€ 18,000.00	€ 18,500.00	€ 30,000.00	€ 197,060.00
Host Viewing - €120	€ 6,000.00	€ 6,240.00	€ 6,480.00	€ 7,200.00	€ 6,960.00	€ 7,440.00	€ 7,200.00	€ 8,400.00	€ 9,000.00	€ 7,200.00	€ 9,024.00	€ 14,400.00	€ 95,544.00
Apply for property - €120	€ 1,500.00	€ 1,560.00	€ 1,620.00	€ 1,800.00	€ 1,740.00	€ 1,960.00	€ 1,800.00	€ 2,100.00	€ 2,230.00	€ 1,800.00	€ 2,236.00	€ 3,400.00	€ 23,886.00
	€ 20,000.00	€ 20,800.00	€ 21,400.00	€ 24,000.00	€ 23,200.00	€ 24,800.00	€ 24,000.00	€ 28,000.00	€ 30,000.00	€ 24,000.00	€ 30,080.00	€ 48,000.00	€ 318,480.00
MONTHLY EXPENSES	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC	YR TOTAL
Marketing	€ 837.00	€ 837.00	€ 837.00	€ 837.00	€ 837.00	€ 837.00	€ 837.00	€ 837.00	€ 837.00	€ 837.00	€ 837.00	€ 837.00	€ 10,044.00
GDPR	€ -	€ 2,000.00	€ -	€ -	€ -	€ -	€ -	€ 1,000.00	€ -	€ -	€ -	€ -	€ 3,000.00
Travel	€ 1,000.00	€ 1,000.00	€ 1,000.00	€ 1,000.00	€ 1,000.00	€ 1,000.00	€ 1,000.00	€ 1,000.00	€ 1,000.00	€ 1,000.00	€ 1,000.00	€ 1,000.00	€ 12,000.00
Domain	€ 27.45	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ 27.45
G-Suite for Business	€ 9.36	€ 9.36	€ 9.36	€ 9.36	€ 9.36	€ 9.36	€ 9.36	€ 9.36	€ 9.36	€ 9.36	€ 9.36	€ 9.36	€ 112.32
Cloud Costs	€ 539.10	€ 539.10	€ 539.10	€ 539.10	€ 539.10	€ 539.10	€ 539.10	€ 539.10	€ 539.10	€ 539.10	€ 539.10	€ 539.10	€ 6,709.20
Database Architect	€ 2,800.00	€ 2,900.00	€ 2,800.00	€ 2,900.00	€ 2,800.00	€ 2,900.00	€ 2,800.00	€ 2,900.00	€ 2,900.00	€ 2,900.00	€ 2,900.00	€ 2,900.00	€ 30,000.00
Sales Rep x2	€ 4,300.00	€ 4,300.00	€ 4,300.00	€ 4,300.00	€ 4,300.00	€ 4,300.00	€ 4,300.00	€ 4,300.00	€ 4,300.00	€ 4,300.00	€ 4,300.00	€ 4,300.00	€ 51,600.00
Director Salary x2	€ 4,000.00	€ 4,000.00	€ 4,000.00	€ 4,000.00	€ 4,000.00	€ 4,000.00	€ 4,000.00	€ 4,000.00	€ 4,000.00	€ 4,000.00	€ 4,000.00	€ 4,000.00	€ 48,000.00
Developers x2	€ 4,800.00	€ 4,800.00	€ 4,800.00	€ 4,800.00	€ 4,800.00	€ 4,800.00	€ 4,800.00	€ 4,800.00	€ 4,800.00	€ 4,800.00	€ 4,800.00	€ 4,800.00	€ 57,600.00
Employee PRSI 4%	€ 624.00	€ 624.00	€ 624.00	€ 624.00	€ 624.00	€ 624.00	€ 624.00	€ 624.00	€ 624.00	€ 624.00	€ 624.00	€ 624.00	€ 7,488.00
VAT 23%	€ 4,600.00	€ 4,784.00	€ 4,968.00	€ 5,820.00	€ 5,334.00	€ 5,704.00	€ 5,820.00	€ 6,440.00	€ 6,900.00	€ 5,320.00	€ 6,918.40	€ 11,040.00	€ 73,250.40
Miscellaneous	€ 500.00	€ 500.00	€ 500.00	€ 500.00	€ 500.00	€ 500.00	€ 500.00	€ 500.00	€ 500.00	€ 500.00	€ 500.00	€ 500.00	€ 6,000.00
BURN RATE	€ 23,756.91	€ 25,913.46	€ 24,097.46	€ 24,649.46	€ 24,465.46	€ 24,833.46	€ 24,649.46	€ 26,569.46	€ 26,029.46	€ 24,649.46	€ 26,047.86	€ 30,169.46	€ 305,831.37
OVERVIEW	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	YR TOTAL
CUMMULATIVE EXPENSES	€ 23,756.91	€ 49,670.37	€ 73,767.83	€ 78,417.29	€ 122,882.75	€ 147,716.21	€ 172,345.67	€ 198,935.13	€ 224,764.59	€ 249,614.05	€ 275,661.91	€ 305,831.37	€ 1,742,584.08
CUMMULATIVE INCOME	€ 35,444.04	€ 56,244.04	€ 77,844.04	€ 101,844.04	€ 125,044.04	€ 149,844.04	€ 173,844.04	€ 201,844.04	€ 231,844.04	€ 255,844.04	€ 285,924.04	€ 333,924.04	€ 2,029,488.48
STATUS	€ 11,687.13	€ 6,573.67	€ 4,076.21	€ 3,426.75	€ 2,161.29	€ 2,127.83	€ 1,478.37	€ 2,908.91	€ 4,879.45	€ 6,229.99	€ 10,242.13	€ 28,092.47	€ 85,904.40

Fig. RentSpot projected cash flow for second year in business



Cashflow for 2023

RENTSPOT		Year 3 Cashflow												
INCOME		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC	YR TOTAL
Previous Year Balance		€ 333,924.04												€ 333,924.04
TOTALS		€ 333,924.04	€ -	€ 333,924.04										
OPERATING REVENUE		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC	YR TOTAL
Property Listing - €30		€ 22,800.00	€ 23,000.00	€ 23,000.00	€ 22,800.00	€ 17,800.00	€ 22,800.00	€ 22,800.00	€ 23,000.00	€ 23,000.00	€ 23,000.00	€ 23,000.00	€ 23,000.00	€ 297,600.00
Host Viewing - €120		€ 10,800.00	€ 12,000.00	€ 12,000.00	€ 10,800.00	€ 8,400.00	€ 10,800.00	€ 10,800.00	€ 12,000.00	€ 14,400.00	€ 12,000.00	€ 12,000.00	€ 142,800.00	
Apply for property - €120		€ 3,373.00	€ 3,750.00	€ 3,750.00	€ 2,623.00	€ 3,750.00	€ 3,750.00	€ 3,750.00	€ 4,800.00	€ 5,250.00	€ 4,800.00	€ 3,750.00	€ 44,625.00	
		€ 36,673.00	€ 40,750.00	€ 40,750.00	€ 36,673.00	€ 28,523.00	€ 36,673.00	€ 36,673.00	€ 40,750.00	€ 48,900.00	€ 40,750.00	€ 40,750.00	€ 484,925.00	
MONTHLY EXPENSES		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC	YR TOTAL
Marketing		€ 837.00	€ 837.00	€ 837.00	€ 837.00	€ 837.00	€ 837.00	€ 837.00	€ 837.00	€ 837.00	€ 837.00	€ 837.00	€ 837.00	€ 10,044.00
GDPR		€ -	€ 2,000.00	€ -	€ -	€ -	€ -	€ -	€ 1,000.00	€ -	€ -	€ -	€ -	€ 3,000.00
Travel		€ -	€ -	€ 1,000.00	€ 1,000.00	€ 1,000.00	€ 1,000.00	€ 1,000.00	€ 1,000.00	€ 1,000.00	€ 1,000.00	€ 1,000.00	€ 1,000.00	€ 10,000.00
Domain		€ 27.45	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ 27.45
i-G Suite for Business		€ 9.36	€ 9.36	€ 9.36	€ 9.36	€ 9.36	€ 9.36	€ 9.36	€ 9.36	€ 9.36	€ 9.36	€ 9.36	€ 9.36	€ 112.32
Cloud Costs		€ 539.10	€ 539.10	€ 539.10	€ 539.10	€ 539.10	€ 539.10	€ 539.10	€ 539.10	€ 539.10	€ 539.10	€ 539.10	€ 539.10	€ 6,709.20
Data Scientist		€ 2,900.00	€ 2,900.00	€ 2,900.00	€ 2,900.00	€ 2,900.00	€ 2,900.00	€ 2,900.00	€ 2,900.00	€ 2,900.00	€ 2,900.00	€ 2,900.00	€ 2,900.00	€ 2,900.00
Database Architect		€ 2,650.00	€ 2,650.00	€ 2,650.00	€ 2,650.00	€ 2,650.00	€ 2,650.00	€ 2,650.00	€ 2,650.00	€ 2,650.00	€ 2,650.00	€ 2,650.00	€ 2,650.00	€ 31,800.00
Sales Rep x2		€ 4,200.00	€ 4,300.00	€ 4,300.00	€ 4,300.00	€ 4,300.00	€ 4,300.00	€ 4,300.00	€ 4,300.00	€ 4,300.00	€ 4,300.00	€ 4,300.00	€ 4,300.00	€ 51,600.00
Director Salary x2		€ 4,000.00	€ 4,000.00	€ 4,000.00	€ 4,000.00	€ 4,000.00	€ 4,000.00	€ 4,000.00	€ 4,000.00	€ 4,000.00	€ 4,000.00	€ 4,000.00	€ 4,000.00	€ 48,000.00
Software Developers x2		€ 5,000.00	€ 5,000.00	€ 5,000.00	€ 5,000.00	€ 5,000.00	€ 5,000.00	€ 5,000.00	€ 5,000.00	€ 5,000.00	€ 5,000.00	€ 5,000.00	€ 5,000.00	€ 40,000.00
Employee PRSI 4%		€ 332.00	€ 332.00	€ 332.00	€ 332.00	€ 332.00	€ 332.00	€ 332.00	€ 332.00	€ 332.00	€ 332.00	€ 332.00	€ 332.00	€ 3,844.00
VAT 23%		€ 8,433.23	€ 9,372.30	€ 9,372.30	€ 8,433.23	€ 6,960.75	€ 8,433.23	€ 6,960.75	€ 9,372.30	€ 13,121.50	€ 11,247.00	€ 9,372.30	€ 9,372.30	€ 111,532.75
Miscellaneous		€ 800.00	€ 800.00	€ 800.00	€ 800.00	€ 800.00	€ 800.00	€ 800.00	€ 800.00	€ 800.00	€ 800.00	€ 800.00	€ 800.00	€ 6,000.00
BURN RATE		€ 29,750.16	€ 32,659.96	€ 31,659.96	€ 30,722.71	€ 28,848.21	€ 30,722.71	€ 30,722.71	€ 32,659.96	€ 35,408.96	€ 33,534.46	€ 31,659.96	€ 31,659.96	€ 347,207.72
OVERVIEW		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	YR TOTAL
CUMMULATIVE EXPENSES		€ 29,750.16	€ 62,410.12	€ 94,070.08	€ 124,792.79	€ 153,641.00	€ 184,363.71	€ 215,084.42	€ 247,746.38	€ 285,155.34	€ 316,687.80	€ 348,349.76	€ 380,009.72	€ 2,440,045.28
CUMMULATIVE INCOME		€ 370,599.04	€ 411,349.04	€ 452,099.04	€ 488,774.04	€ 517,299.04	€ 553,974.04	€ 570,447.04	€ 631,397.04	€ 688,447.04	€ 737,347.04	€ 778,079.04	€ 818,847.04	€ 7,038,888.48
STATUS		€ 340,848.88	€ 348,938.72	€ 358,028.96	€ 363,981.25	€ 363,458.04	€ 369,410.33	€ 375,562.62	€ 383,652.46	€ 405,293.70	€ 420,659.24	€ 429,749.28	€ 438,839.32	€ 4,598,823.20

Fig. RentSpot projected cash flow for third year in business

Financial Assumptions

Year One

- RentSpot has to account for any unexpected expenses and events that may arise, therefore some assumptions may not line up with the projections within the first year
- RentSpot is enrolled into [New Frontiers start-up programme](#)
 - ◆ Support package valued at €55,000 is acquired from this program (€30,000 - (Phase 1, €15,000 - Phase 2, €10,000 - Phase 3))
- RentSpots' app development only takes 4 months
- RentSpots' application goes live in May
- 1788 properties are listed on the RentSpot from May to December, generating € 141,252 gross revenue
 - ◆ 1788 properties x €50 enlisting fee = €89,400
 - ◆ 1788 properties x 10 applications each = €8,940
 - ◆ 20% of 1708 properties listed avail of host viewing service = € 42,912
- Software developer is hired from January on salary of €26,400 p/a
- Sales representative is hired from March on salary of €24,000 p/a
- Directors receive a salary of €24,000 p/a each
- Employee PRSI and VAT expense for the year amounts to € 34,810.36
- RentSpot makes profit of €15,444.04 in the first year of business



Year Two

- 3981 properties are listed on from January to December, generating €318,480.00 gross revenue
 - ◆ 3981 properties x €50 enlisting fee = €199,050.00
 - ◆ 3981 properties x 12 applications each = €23,886.00
 - ◆ 20% of 3981 properties listed avail of host viewing service = €95,544.00
- Database architect is hired from January on salary of €30000 p/a
- Another sales representative is hired from January on salary of €25800 p/a
- Another software developer is hired from January on salary of €28800 p/a
- Employee PRSI and VAT expense for the year amounts to €80,738.40
- RentSpot makes profit of €28,092.67 in the second year of business

Year Three

- 5950 properties are listed on from January to December, generating €484,925 gross revenue
 - ◆ 5950 properties x €50 enlisting fee = €297,500.00
 - ◆ 5950 properties x 12 applications each = €44,625.00
 - ◆ 20% of 5950 properties listed avail of host viewing service = €88,344.00
- Data scientist is hired from January on salary on €34,800.00
- Employee PRSI and VAT expense for the year amounts to €119,188.75
- RentSpot makes profit of €435,567.32 in the third year of business

Financial Requirements

In RentSpots first three years of business most of our income will be used for employee salaries. We have projected that in the first year of business, this will cost around €94,400 per year which is 66% of our operating revenue. In the second year of business, salary costs will escalate as business grows and it is projected that salary expenses will be €187,200 or 58% of RentSpots operating revenue. In Rentspot's third year of business, employee salary is further projected to grow to €226,200 which accounts for 46% of our operating revenue. Based on these salary projections for the first three years of business we expect that RentSpot's PRSI expenses will come to €3776, €7488 and €7656 respectively. We also project that we will need to reachout to external sources to consult with a GDPR compliance expert. We expect that this will be an additional contract of €3000 per year and a total of around €9,000 in our first three years in the market.

RentSpots next highest cumulative expense will be dedicated to our Value Added Tax on our operating income at 23%. We have projected these figures based on assumed 11,719 properties being listed with RentSpot within the first three years of business. This will cost €32,487.96, €73,250.40 and €111,532.75 per year respectively.

Marketing will be another major cost that will be required to build and maintain relationships with our customer segments. This expense consists of leasing billboards and metropanels in major towns and cities in Ireland along with launching online marketing strategies using online advertising. We have looked into the costs of leasing physical advertising spaces in these areas and it came to a total of €9108 per month. We would not avail of this physical advertising campaign every month in RentSpot but we will be consistently using an intense online marketing strategy using Google and Facebook advertising at a rate of €472 per month. As RentSpots operating revenue grows more money will be



invested in online marketing from the second year of business and onwards. We project that the cost of online advertising will almost double to €837 per month bringing the total marketing costs of RentSpot to be €51,660.

Cloud costs are estimated using [Google Cloud Platform Pricing Calculator](#) and consist of using App Engine, Cloud SQL and Cloud Storage services. In the first year of business cloud costs are estimated to begin at € 320.56 per month which brings this expense up to € 3,205.60 within the first year of business. As the business expands and grows, the cost of cloud costs per month from second year onwards add up to around € 559.10 per month which equals to around €13418 in the years two and three of business.

RENTSPOT		
	Year 1	Year 2/3
App Engine		
Number of instances per hour	1	2
Instance type	F4_1G	F4_1G
Memory limit	2048 MB	2048 MB
CPU limit	2.4 GHz	2.4 GHz
Scaling type	automatic	automatic
Cloud SQL		
Number of instances	1	1
Instance type	db-pg-f1-micro	db-pg-f1-micro
Storage	250GB	500GB
Backup size	250GB	500GB
Cloud Storage		
Storage	2TB	2TB
Class A operations per month	2 million	2 million
Class B operations per month	2 million	2 million
Cost per month	€472.00	€559.10

Fig. Cloud costs estimates

In Rentspots financial projection plan we allowed for a balance of €600 per month to be dedicated as travel expenses to our sales representative team in the first year. As RentSpot grows we have allowed for an additional €400 to be dedicated to travel bringing it to a total of €1000 per month. We have given an allowance of this value to account for the travel necessary for our team to onboard new landlord clients that will list properties on our platform which comes to an expected cumulative value of €30,000 within our first three years in the market.

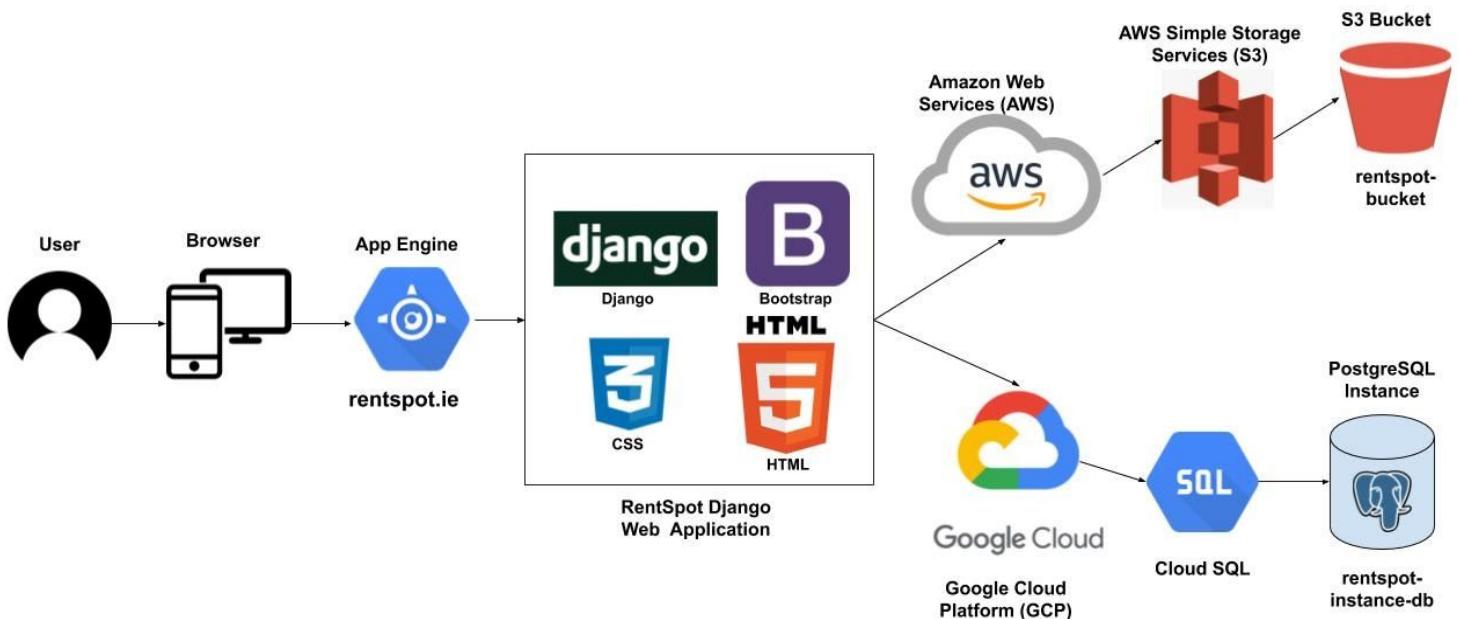
On top of these expenses we have accounted for software licensing and other miscellaneous expenses that may occur throughout RentSpot's early years in the market with regards to office materials. We have allocated a value of €500 for misc items and €10 for G-Suite Business package for small teams. Given all of our previous stated assumptions we have allocated a value of €18,360 to be used on different items and licensing that may be necessary.



Technical Delivery

Prototype Software Architecture

- ❑ RentSpot prototype backend is built using Django web framework
 - ❑ Django follows (MTV) architecture
 - ❑ Model - data structure
 - ❑ Template - data presentation
 - ❑ View - data logic
- ❑ Django front-end template content is formatted using HTML, CSS and Bootstrap style
- ❑ RentSpot used Google's Cloud SQL PostgreSQL database for data management
- ❑ App Engine is used to host and deploy Django web app on Google managed data centers
- ❑ RentSpot prototype uses Amazon Simple Storage Services (AWS S3) to store sensitive data storage, profile/house pictures
 - ❑ All data is encrypted on storage and decrypted when requested



Functional Specification

Sign in/Register Function - Tenant/Landlord Profile - see Appendix E

In order to use RentSpot, our application will prompt to

1. Register a new account
2. Sign in into an existing account.

If a user will choose to register a new account, they will be presented with a screen that asks them to enter a number of personal details such as date of birth, name and a valid email. They will also need to select a username that's between 5 to 15 characters long and a password that



- Contains at least 8 characters
- Can't be too similar to your personal information
- Can't be a commonly used password e.g hello123
- Can't be entirely numeric

Users will also need to specify whether they are a landlord or a tenant. In order to complete registration the user will have to click the ‘Register’ button. By clicking ‘Register’, users agree to our Terms and Conditions that can be accessed by the link at the bottom of the screen.

If a user already has an account, they can log into RentSpot by entering their unique username and password that they used when they created the account.

Tenant Portal - Tenant Profile - see Appendix F

Tenants can access the tenant portal by clicking ‘Profile’ that can be found in the navigation bar. Tenant users of the RentSpot will have the ability to set their profiles criteria and upload supporting documentation to aid them in renting a property. The documentation that they tenants can upload is:

- References from previous landlords
- Reference from your current employer
- Recent bank statements / payslips
- Photo ID such as driving license or passport

The documents can be uploaded to their profiles by clicking ‘Update Profile’ within the tenant portal. Tenants can also see the properties they have applied for and their upcoming scheduled property viewings.

Browse Available Listings function - Landlord Profile/Tenant Profile - see Appendix G

Users can browse available property listings on the site by using the homepage. They will also have an ability to refine their search by using the filtering system implemented that allows users to refine by county, type of property, number of bedrooms and bathrooms.

View Property function - Tenant Profile - see Appendix H

Tenant users can view a property listing that they are interested in by clicking ‘View Property’.

Tenants will see general information about the property. This information includes:

- Property description
- Property location
- Type of the property
- Rent price per month
- Number of bedrooms and bathrooms
- Criteria set out by the landlord

Apply for property viewing function - Tenant Profile - see Appendix I

Tenants can apply for properties that are listed by landlords by clicking ‘Spot On’. Tenants can only apply for the property if they are logged into their tenant account and meet the requirements set out by the landlord. Tenants will be told if they don’t meet the requirements.

Add a Guarantor function - Tenant Profile - see Appendix J

For properties that a tenant wishes to apply but does not meet the required criteria , they have the functionality to add a guarantor and add in the required fields. This data will then be added to the tenants profile broadening their application constraints.



Property Review function - Tenant Profile - see Appendix K

Tenants can leave reviews on the properties that are listed by landlords by clicking ‘Leave a Review’ . This allows tenants to leave reviews about the properties and gives other tenants a look at previous reviews left by other tenants.

Landlord Portal - Landlord Profile - see Appendix L

Landlords can access the landlord portal by clicking ‘Profile’ that can be found in the navigation bar. Landlord users can upload identification documents such as a driving license or passport by clicking ‘Update Profile’ within the landlord portal.

In the landlord portal, landlords have a clear view of their active listings and applications that they have received for their properties. Landlords can also see property viewings that have come up at the bottom of the page.

View Profile function - Landlord Profiles - see Appendix M

In the landlords portal under the heading applications, where all the tenants that have applied for their listing. The landlord user will be able to view the profile of the applicants to their property. In the view property function we have added an information carousel displaying the tenants supporting documents all in one place for the landlord

Schedule Viewing function - Landlords - see Appendix N

After a review of the profile the Landlords will be prompted to schedule a viewing time and date with the tenant . This will then appear on a tile in both the landlord and tenants profile displaying appointment date and the address of the property.

Manage Property - Landlord Profile - see Appendix O

If the landlord is viewing the property that he has listed, he can click ‘Manage My Spot’ to amend information about the property. Information that landlord can change about the property is:

- Edit property description
- Change the rent price
- Amend requirements
- Add more photos

Create a listing - Landlord Profile - see Appendix P

Landlord profiles can list properties through the homepage. To get started, landlords need to click the ‘Create Listing’ button that will be displayed in their navigation bar. Landlords will then be prompted to enter general information about the property, such as address, type of property, number of bedrooms and the rent price. Landlords will then be prompted to add in property overview/description, lease duration, property availability, facilities and photos. Landlords will also enter their own requirements for possible tenants.

Tools and Technologies Used

Python - 3.7.3

Python is an object-orientated, high level programming language. We chose to develop RentSpot using python as we both had some experience working with it and because of its



flexibility. There are also a number of different frameworks available to python for web development.

Django - 3.0.3

We chose to use this Python open source web-framework, as both of us have had the most experience working with it in the past. We got introduced to Django during CA229 - Developing Internet Applications and got a real taste of it in CA377 - Programming Fundamentals (Project). Django follows MTV Architecture (Model, Template and View) and using this architecture “encourages rapid development and clean, pragmatic design”. This framework also is very secure and achieves this by providing tools to prevent any common security mistakes. Django is exceedingly scalable and well thought out framework....

Django-crispy-forms - 1.8.1

This made the management of Django forms much more easier. This library allowed us to adjust form properties in the backend without having to re-write it in the template.

Django-filter - 2.2.0

Django-filter allowed us to implement a dynamic QuerySet filtering system based on the URL parameters

Django-storages - 1.9.1

This is the collection of custom storage backends for Django. In this case it was used to support a backend that interacts with Amazon Simple Storage Services (S3).

Boto3 - 1.12.42

Boto3 is the AWS Software Development Kit for Python, this package allows us to connect our application to AWS Simple Storage Services (S3) and use that as default storage for static files.

Psycopg2 - 2.8.5

Psycopg2 is PostgresQL database adapter for the Python programming language. This package needed to be installed in order for our Django application to connect to PostgreSQL database.

PostgreSQL - 11

PostgreSQL was the database of our choice. It is an open-source object Relational Database Management System RDBMS. PostgreSQL uses a client/server database model and server process that handles the client communication and manages database operations. One of the main reasons for choosing this database was that using default SQLite DB wouldn't work in the long run.

HTML

HTML was used to provide structure to the content displayed by the use of different tags, elements and attributes.



Bootstrap

Bootstrap is a free and open-source CSS framework, which is responsible for responsive, mobile front-end web development. This allowed us for faster web design using predefined classes to display our HTML web pages.

CSS

CSS was used for further describing the presentation of a document written in markup language like HTML. We used some CSS to help compliment the predefined bootstrap classes and design our application in further detail.

AWS - Simple Storage Services (S3)

AWS S3 is an object storage service that you can use to store and retrieve any amount of data, at any time from anywhere on the web. We used this service to store objects in pre-defined S3 buckets. Files in these buckets could be retrieved by anyone that had the right access. S3 is configured automatically to scale up or down based on the need.

Google Cloud Platform - App Engine

App Engine is a cloud computing platform that was used to host the application on Google's managed servers. App Engine offers automatic scaling for web applications, which means that if the number of requests increased for application it would automatically allocate more resources. Using this service allowed us to deploy our application in the matter of minutes without having to worry about managing the underlying infrastructure.

Google Cloud Platform - Cloud SQL

Google's Cloud SQL provides a fully-managed database service that allows us to run and manage our PostgreSQL database in the cloud. With our migration to PostgreSQL DB, this allows both of us to use the same database during development.

Other Relevant Tools

JIRA

JIRA is a project-management tool that is used for issue/bug tracking and project management purposes. In JIRA we created user stories from the point of view of our two customer segments. From them user stories we then started to assign development tasks to them user stories. If there were any errors in the functionality of our application, we would raise a bug ticket that would allow us to track any bugs/issues that occur during the development process.

PyCharm

PyCharm is an integrated development environment (IDE) used specifically for the Python application development. Main benefits of using this IDE is that it allows us to carry out any programming tasks using one environment.



GIT

GIT is a version control tool for tracking changes during software development. From using GIT we were both able to work on the same code by using different branches, this made for quicker development and ease of code management. It also allowed us to rollback to a version if newly developed features were flagging errors.

Google Hangouts

Google Hangouts is a communication software that allows communication using text, voice, video chat and screen sharing. Google Hangouts was used to collaborate and share knowledge and carry out programming tasks together.

InVision Studio

InVision Studio is a design tool that is used for high quality interactive designs of proposed prototypes. After the functionality development of RentSpot, we started to make design templates using this tool. This helped us to pick the appropriate user interface design for our application and gave us a good idea of what the finished prototype should look like. Once the wireframe was created, it was much easier to design the application by using wireframe as a template.



Logical Database Design

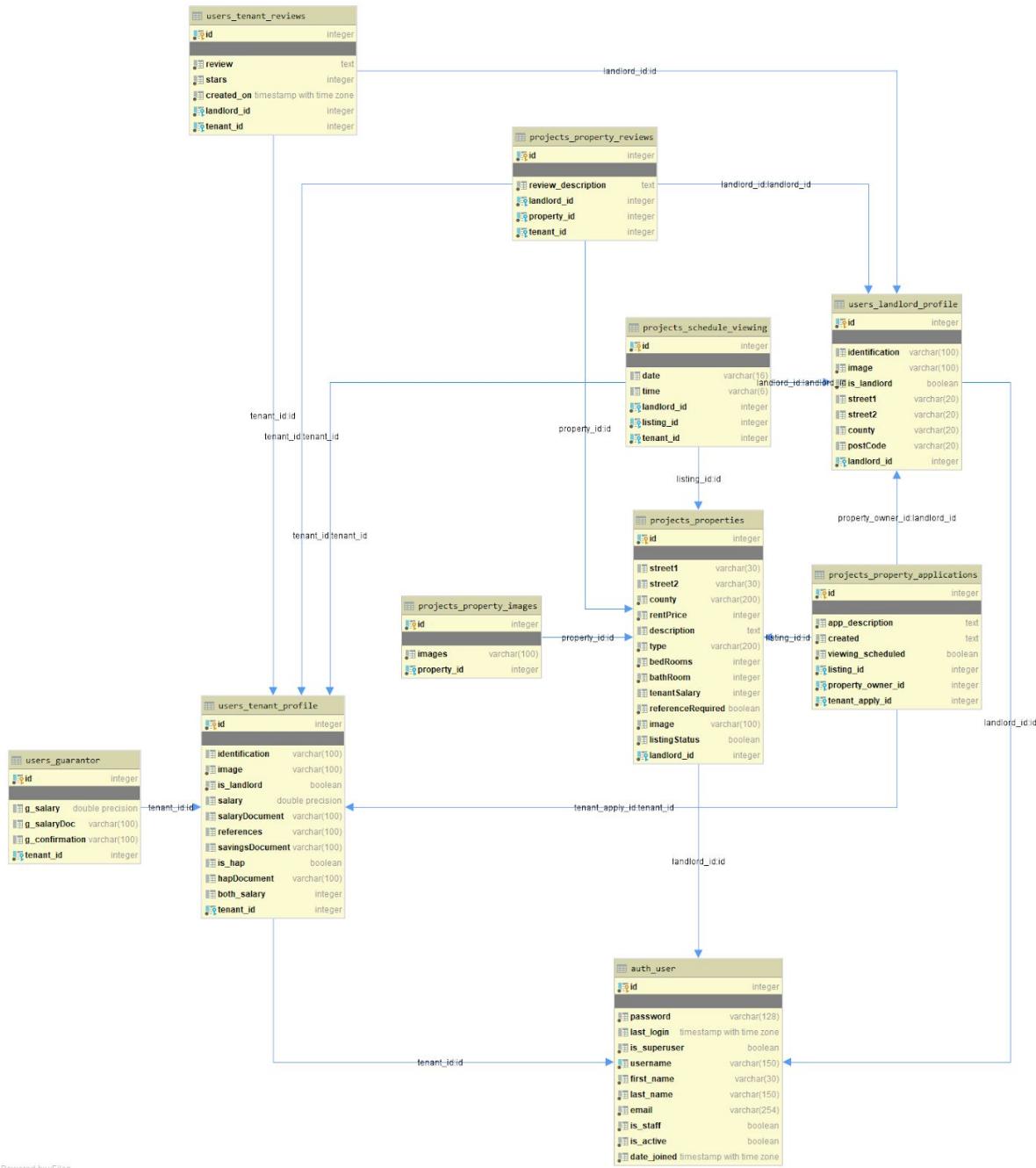


Fig. RentSpot Logical Database Model



Data Storage requirements and security

AWS Simple Storage Services (AWS S3) - sensitive data storage

We implemented AWS S3 cloud storage services in order to store and handle sensitive user uploaded documents. We felt like data security would be the highest priority if we would ever go into full production. AWS S3 provides storage infrastructure for the storage of primary data. All objects stored on multiple devices across multiple regions in an Amazon S3 region.

Data is stored using S3 standard class which suits best for frequently accessed data.

In order for our application to connect to the RentSpot AWS S3 bucket, it has been given temporary access privileges through the identity management panel in AWS. These credentials give specific permissions to the RentSpot application when using AWS S3 services.

We followed the best AWS security practice which allowed us to implement server-side encryption (AES-256). Before storing any documents that users upload to our platform, they are encrypted and then decrypted when it's downloaded. This offers great data security as before data is stored it's encrypted, and the only way the data is decrypted is by using AWS secret access key.

Amazon S3 also offers further data protection by using versioning. This can be used to retrieve and restore every object that has ever been stored in our RentSpot AWS S3 bucket. In the worse case scenario this would allow us to recover any version of any object ever stored.

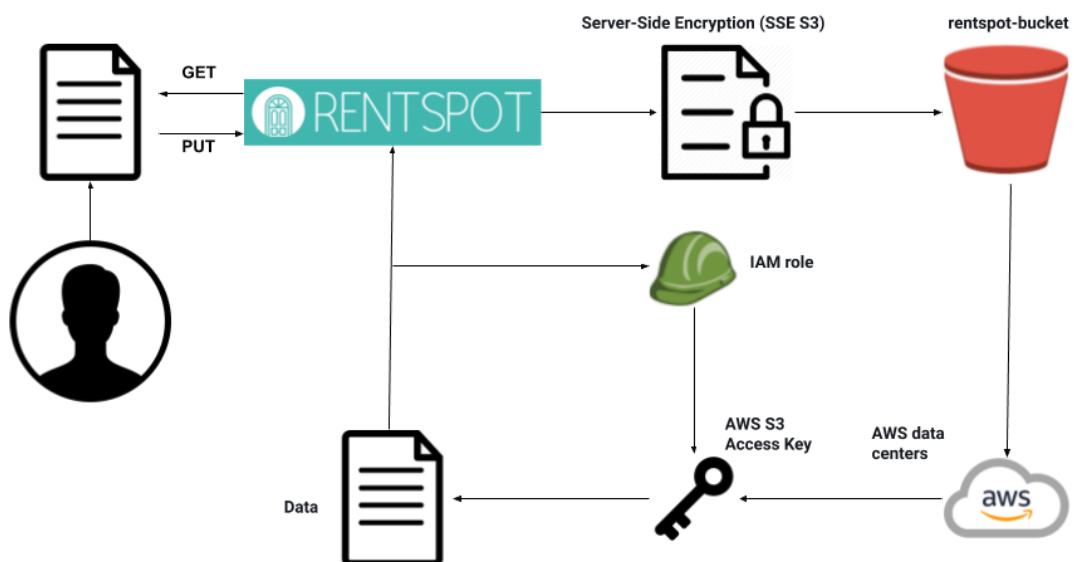


Fig. AWS S3 data storage and server side encryption

Cloud SQL - PostgreSQL - data storage

Cloud SQL is the database service that we used to manage our data using Google Cloud Platform. We chose to use the Cloud SQL instance PostgreSQL relational database for different benefits that it offers. This database lives in the Google Cloud, which means that all the maintenance and support is provided by Google itself.



The storage space starts at 10GB and can be expanded based on demand at extra cost. Instances are configured with 1 CPU with 3.75GB RAM and can be increased on the demand. Cloud SQL made it much easier to manage our database during development stages of the project. This service also offers automated backups, security and easy integration with Google App engine.

Data stored in our database is encrypted using 256-Bit Advanced Encryption Standard, the same key is used to encrypt data when stored and decrypt when it's in use. Additional security measures can be applied like configuring SSL to allow or deny connections to the database.

Dataflow and Use Case diagrams

Tenant Data Flow Diagram

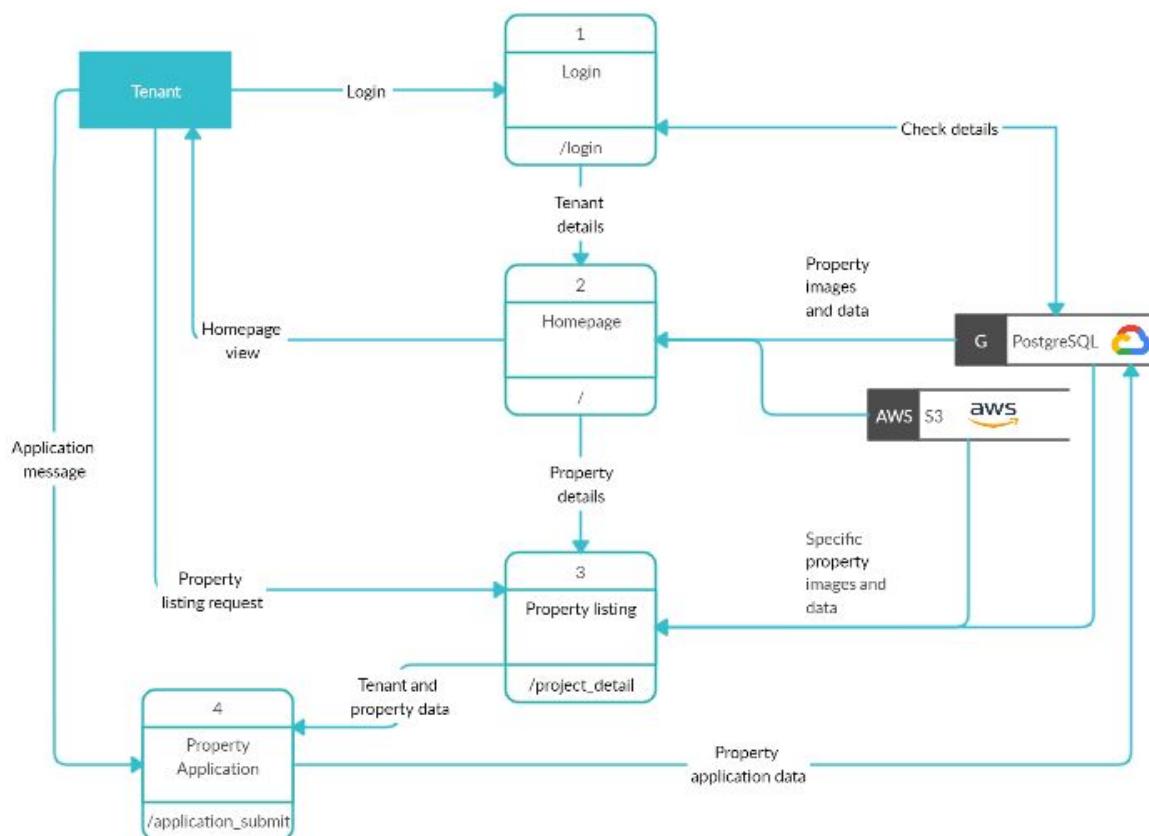


Fig. Tenant property viewing application data flow diagram



Landlord Data Flow Diagram

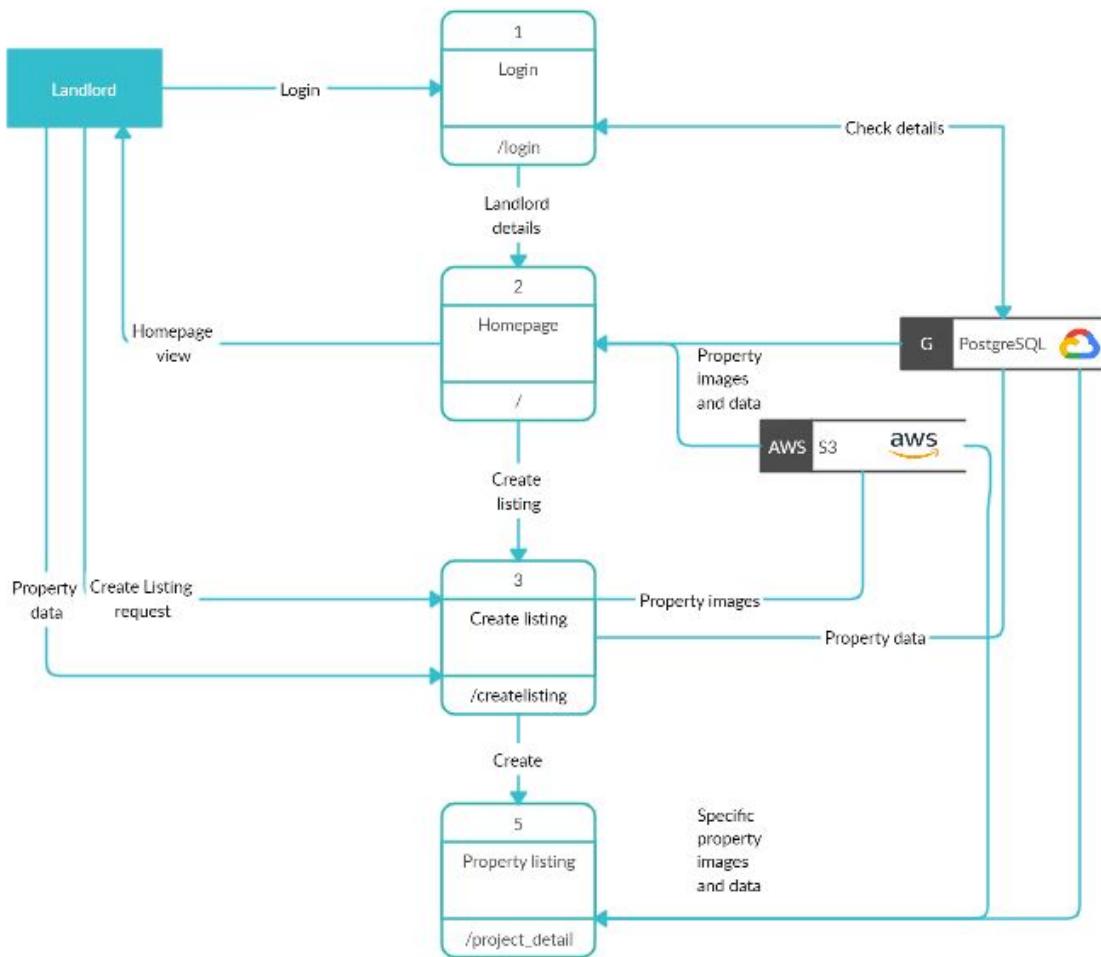


Fig. Landlord create a property listing data flow diagram

Use Case #1

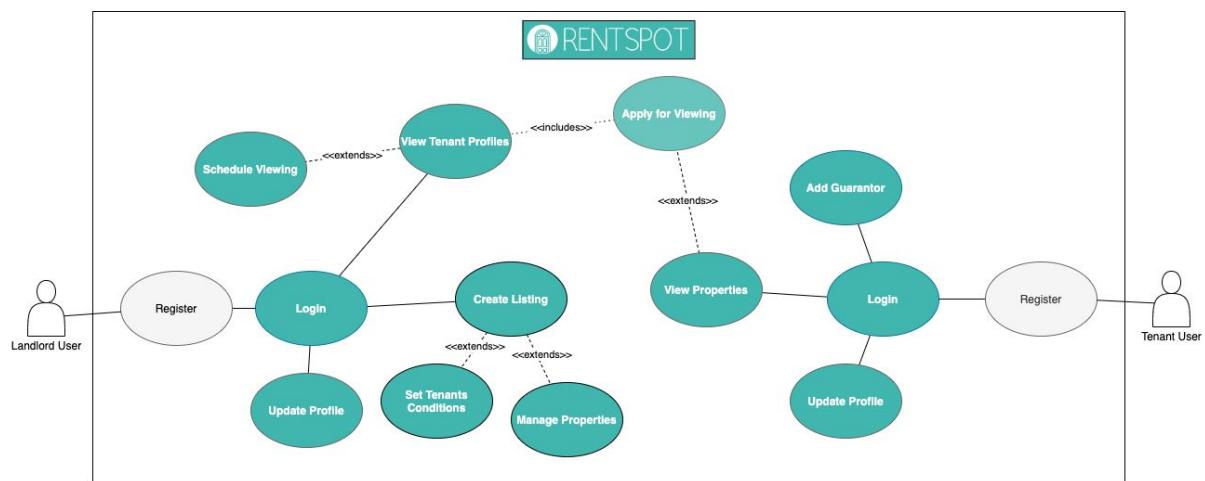


Fig. RentSpot environment use case



Use Case #2

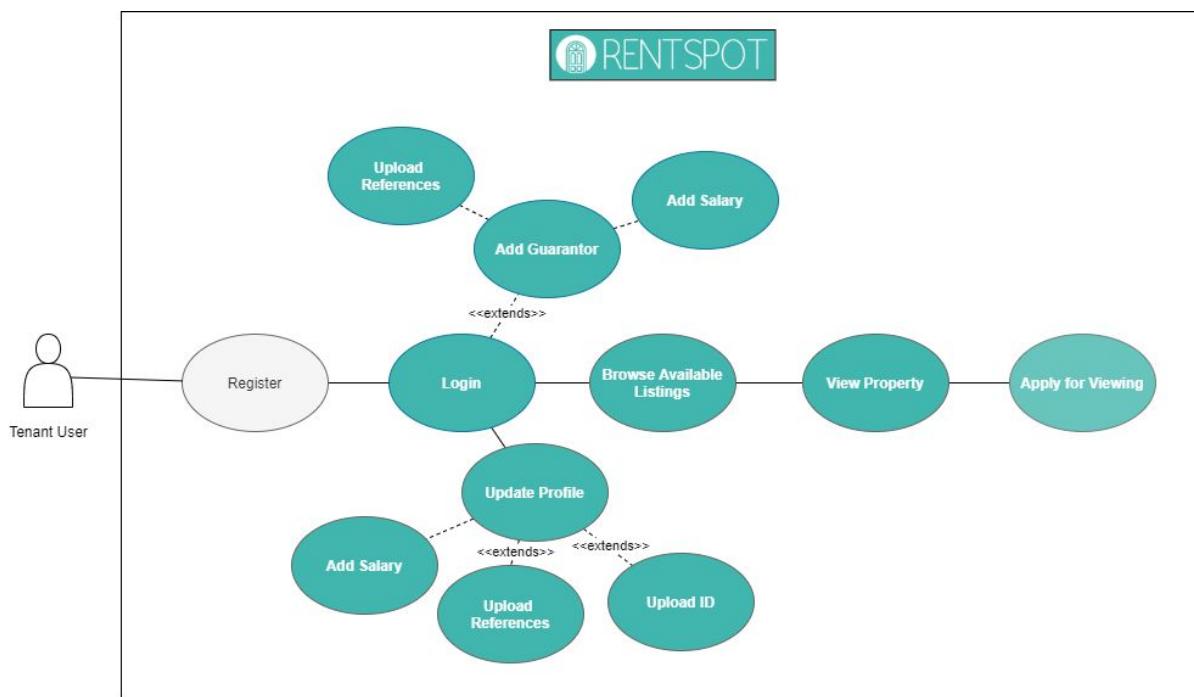


Fig. Tenant applies for a property viewing using a guarantor use case

1. Users will access RentSpot through their web browser.
2. Users will begin the registration by clicking the ‘Register’ button.
3. User will fill out the registration form: email, password and username.
4. Users will complete registration, by clicking the ‘Register’ button. By clicking ‘Register’, the user agrees to RentSpot’s Privacy Policy and Terms of Use.
5. User will verify his email address by signing into their email and clicking the verification link.
6. User will navigate to their portal by clicking ‘Profile’ in the navigation bar.
7. User will click ‘Update Profile’ to add any supporting documentation.
8. User will click the “Add Guarantor” button in their portal.
9. User will upload Guarantors supporting documents
 - 9.1. Guarantor Agreement
 - 9.2. Salary Information/Document
 - 9.3. Salary as an integer
10. User add a Guarantor to their profile by clicking ‘Add Guarantor’ profile.
11. Users can browse through different property listings or use dynamic search to satisfy their needs.
12. Users can view properties in more detail and apply, if they meet the requirements.
13. Users will receive a notification, once a viewing has been scheduled.



Use Case #3

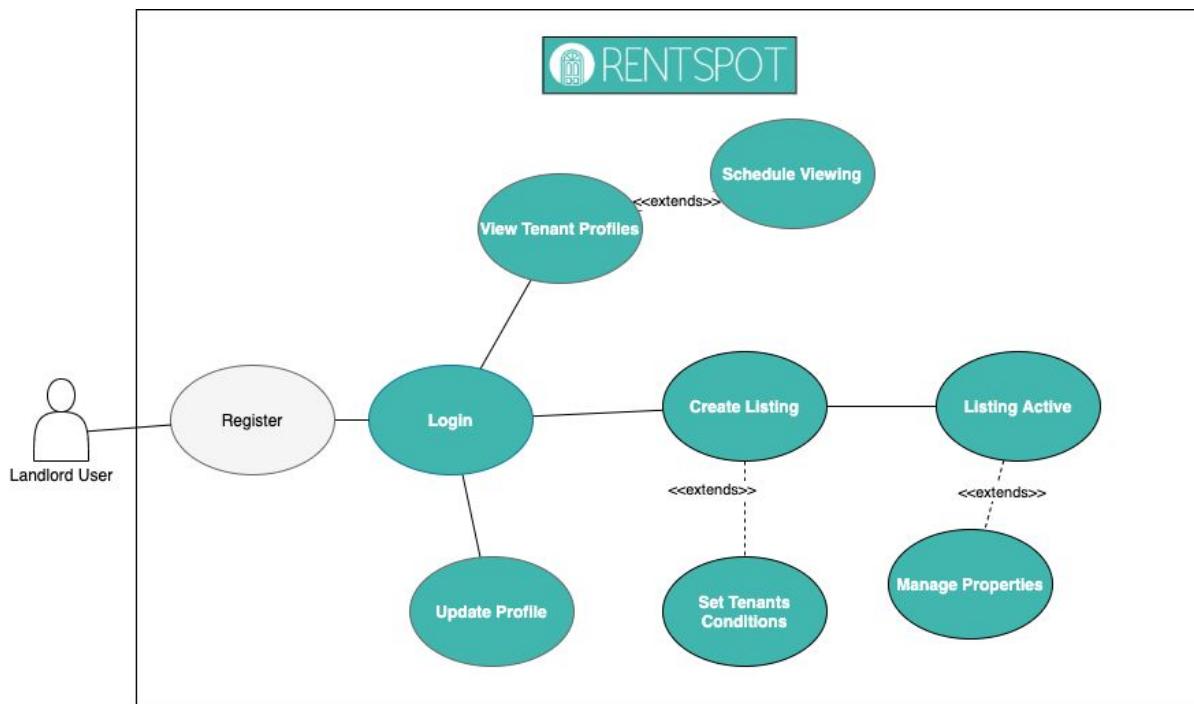


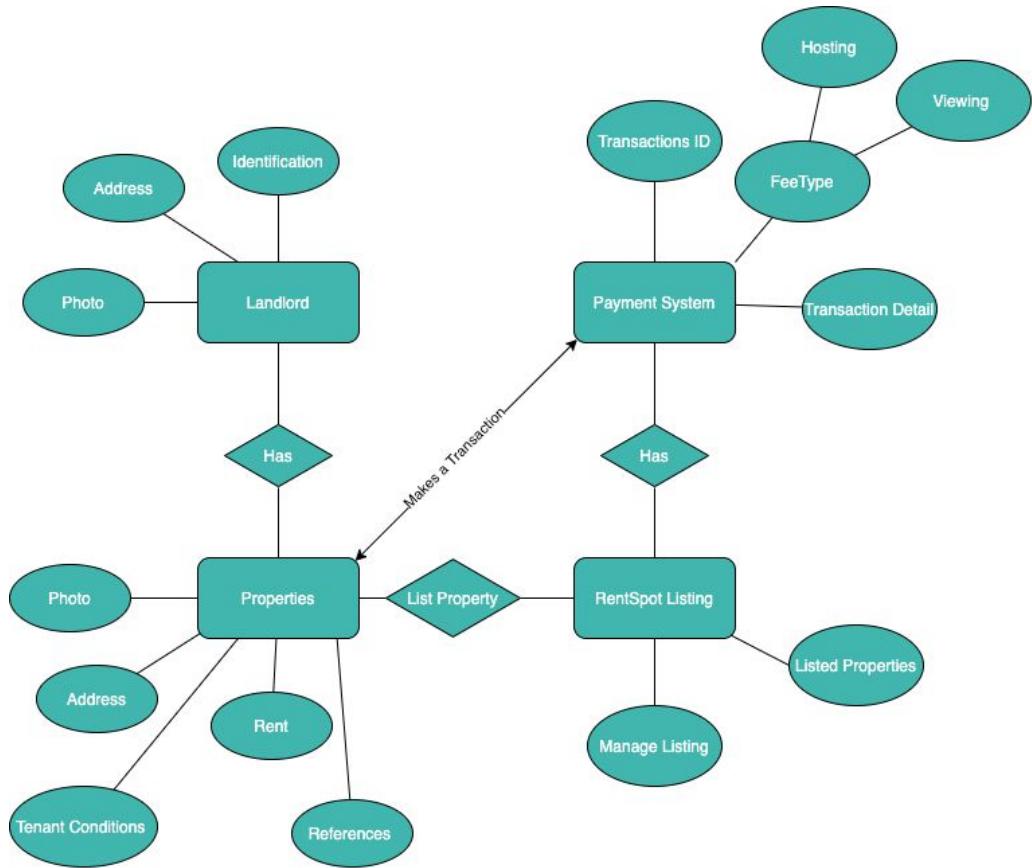
Fig. Landlord creates a property listing use case

1. User will access RentSpot through their web browser.
2. User will begin the registration by clicking the 'Register' button.
3. User will fill out personal information such as email, password and username.
4. User will complete registration, by clicking 'Register' button. By clicking 'Register', user agrees to RentSpot's Privacy Policy and Terms of Use.
5. User will verify his email address by signing into their email and clicking verification link.
6. User is then asked to verify their identity, this can be achieved by uploading a photo of government ID and self-taken picture.
7. User will create an advertisement by uploading photographs and a description of the property and set lease requirements for potential tenants.
8. The user will schedule property viewings with potential tenants when there is a pool of applicants.

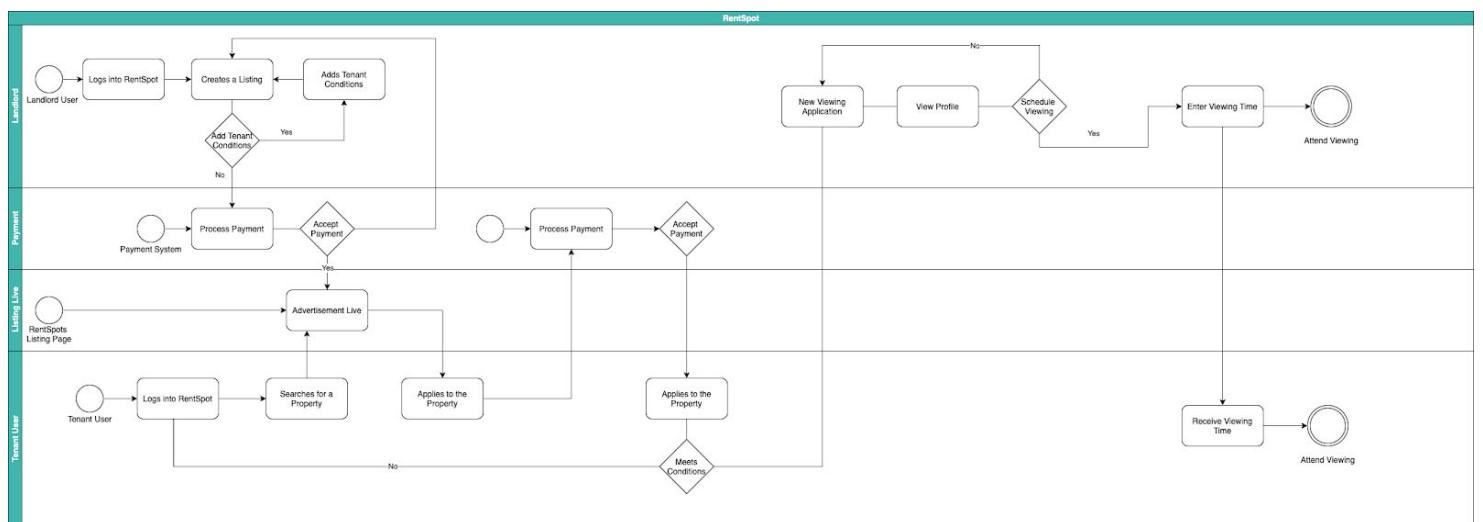


Zachman Framework

Owner - Semantic Model

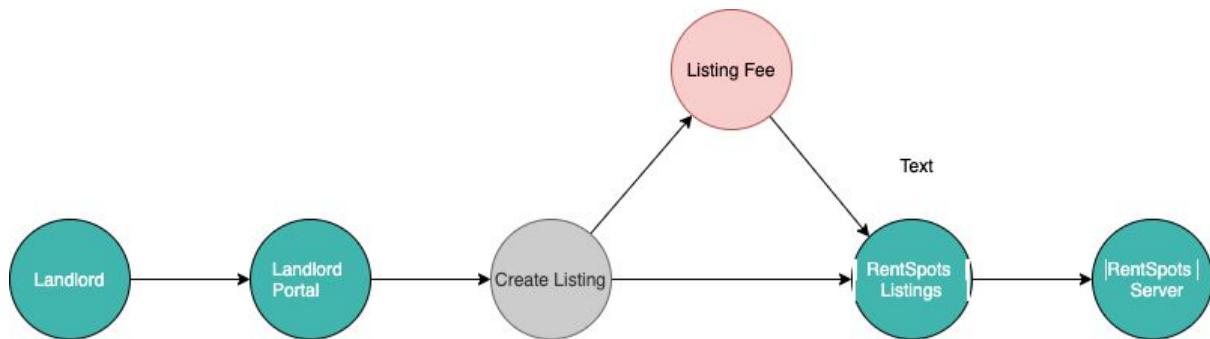


Owner - Business Process Model

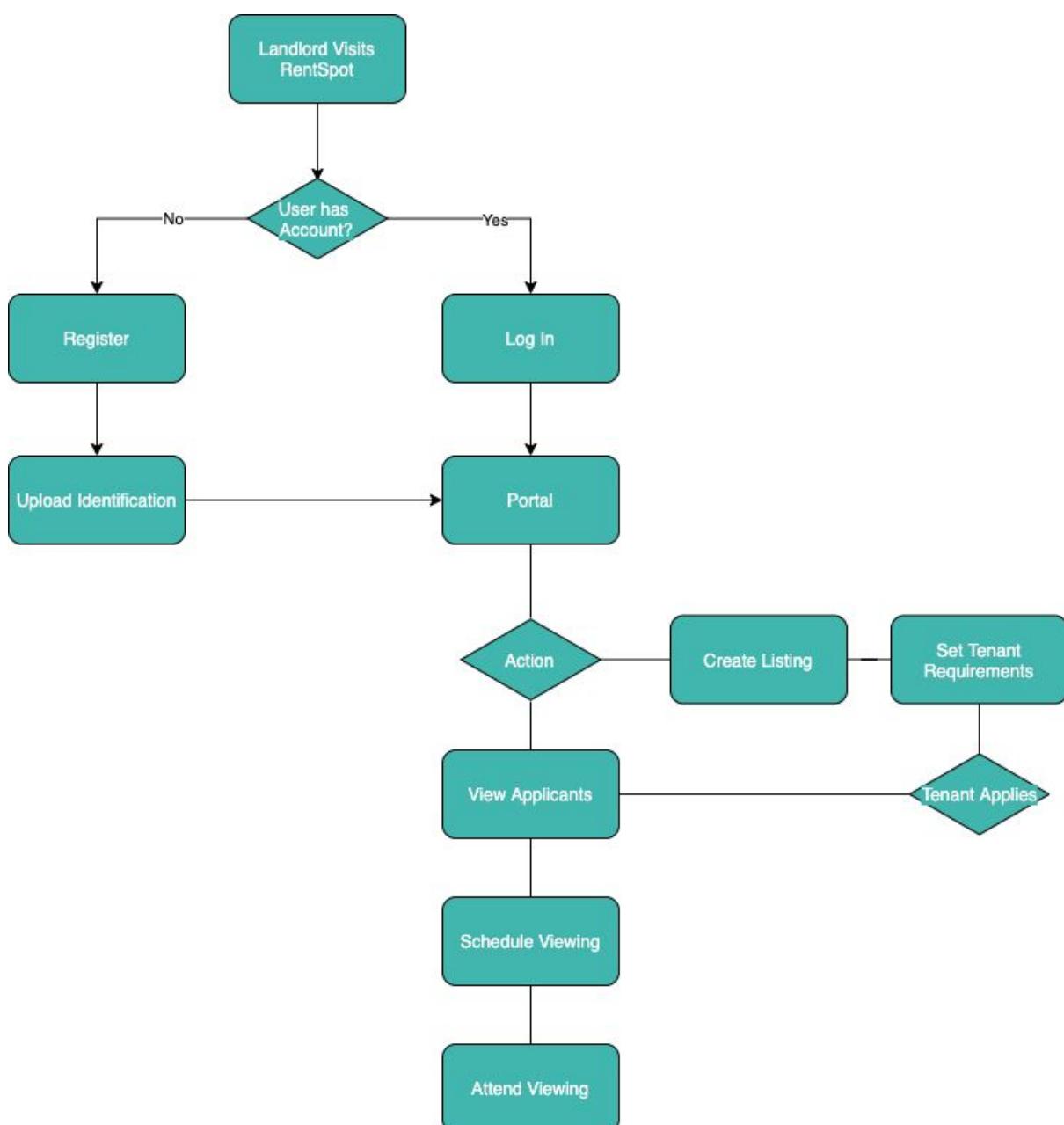




Owner - Logistics Network

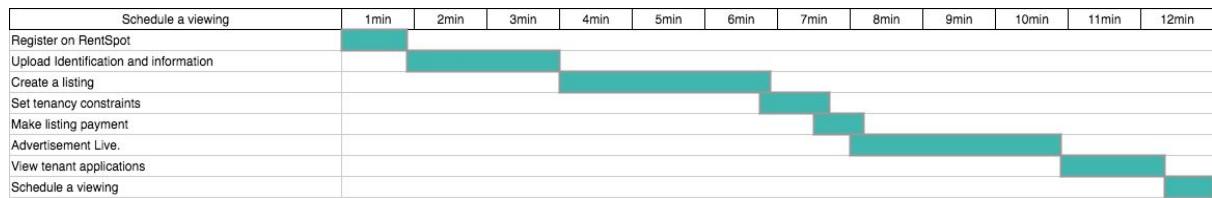


Owner - Workflow Model

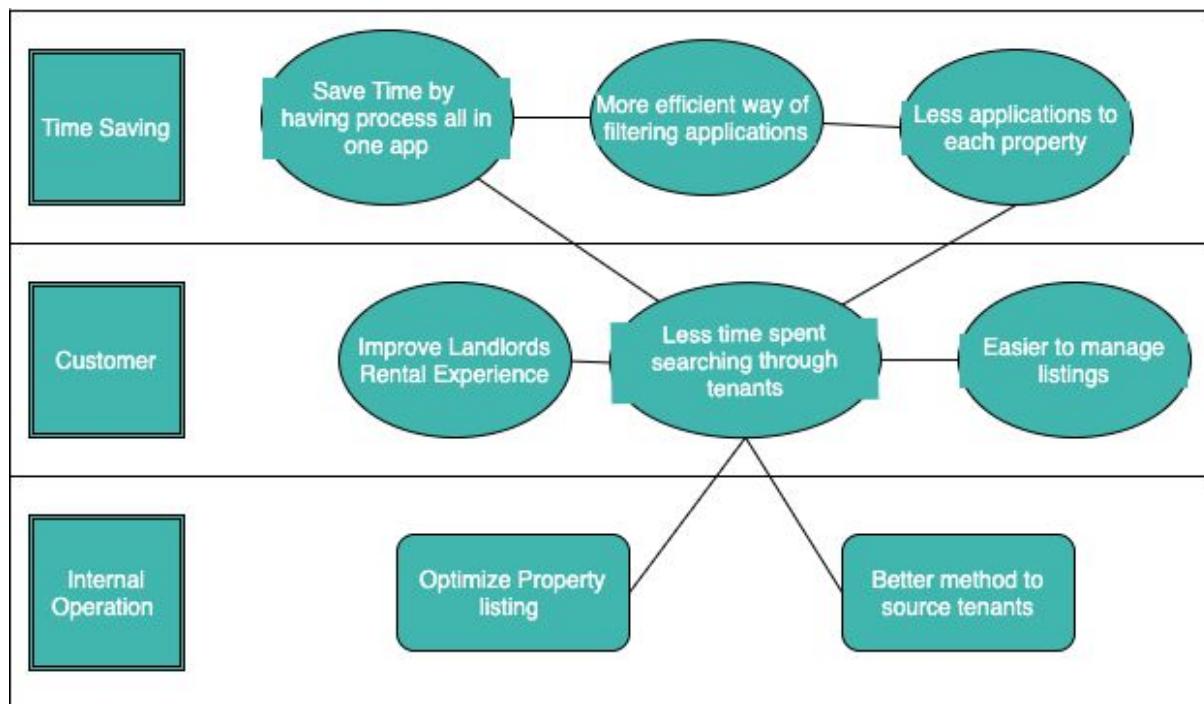




Owner - Gantt Chart

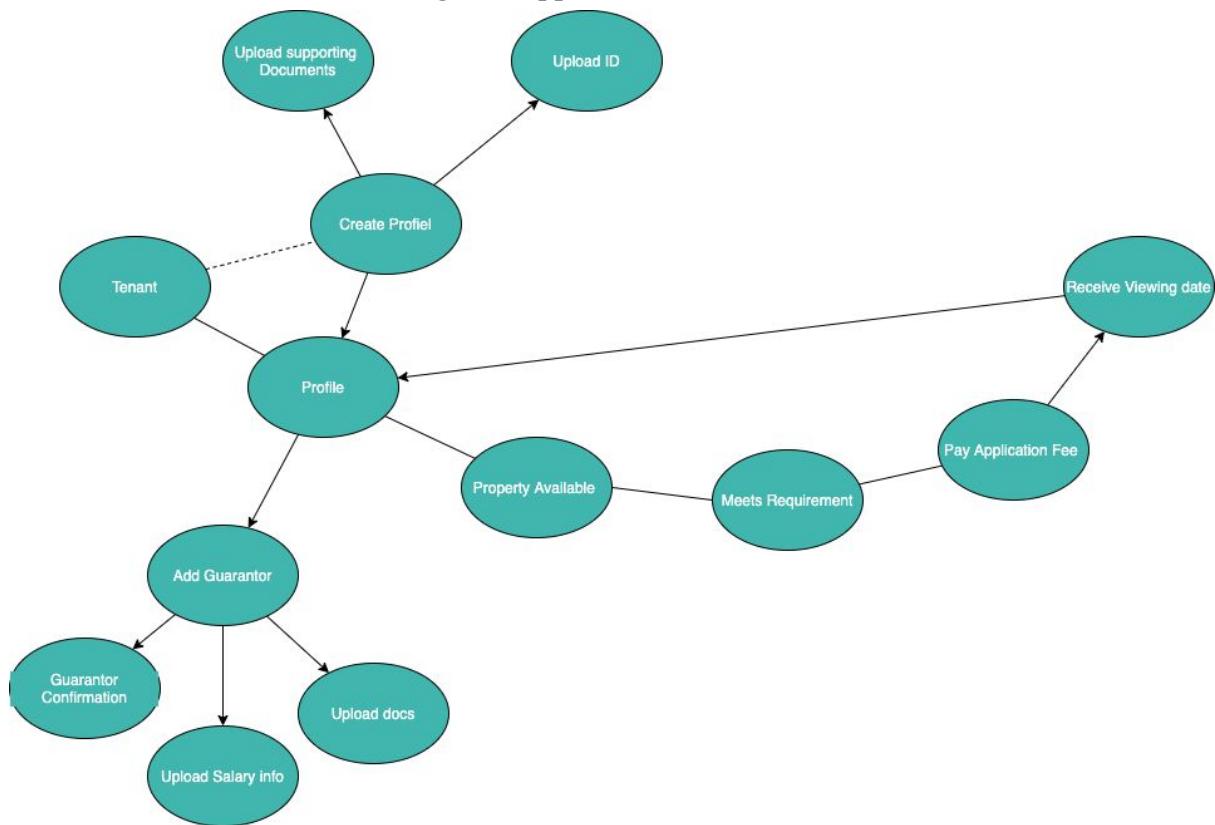


Owner - Strategy Map



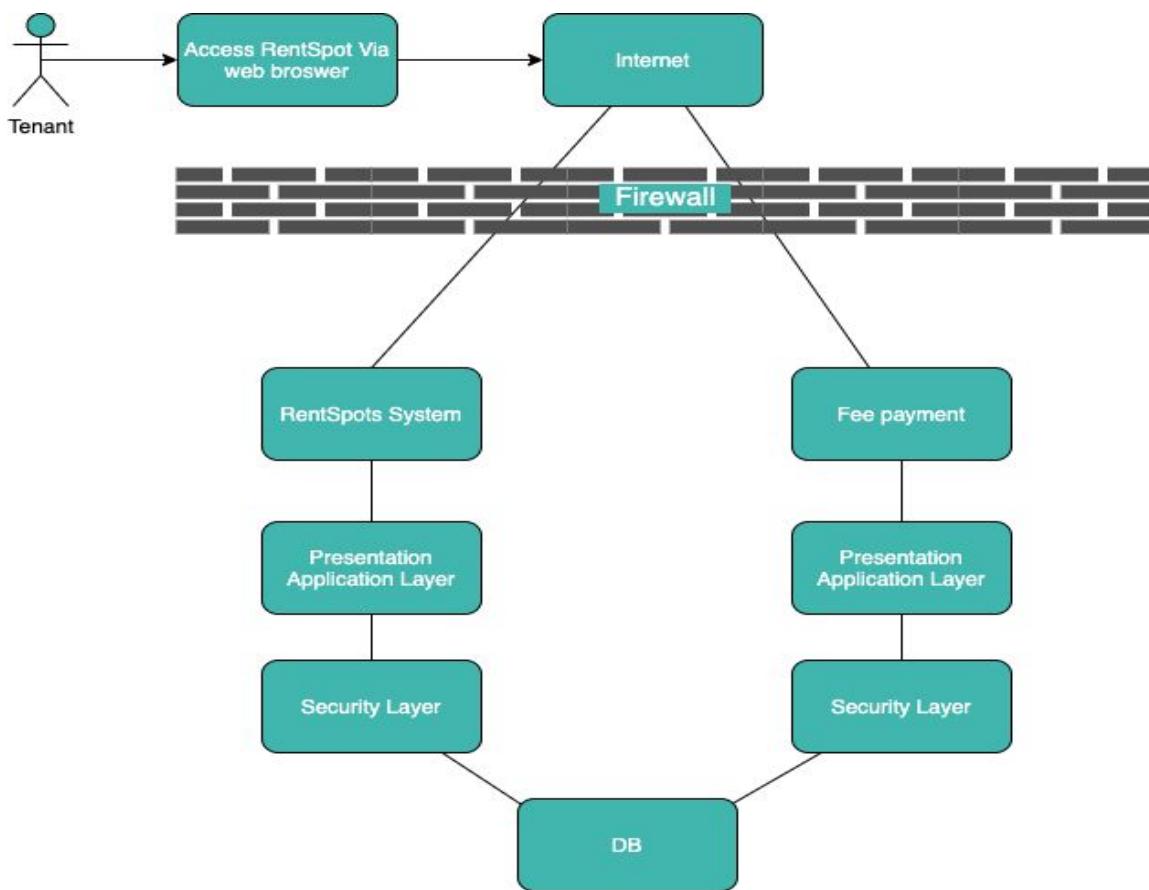


Designer - Application Architecture

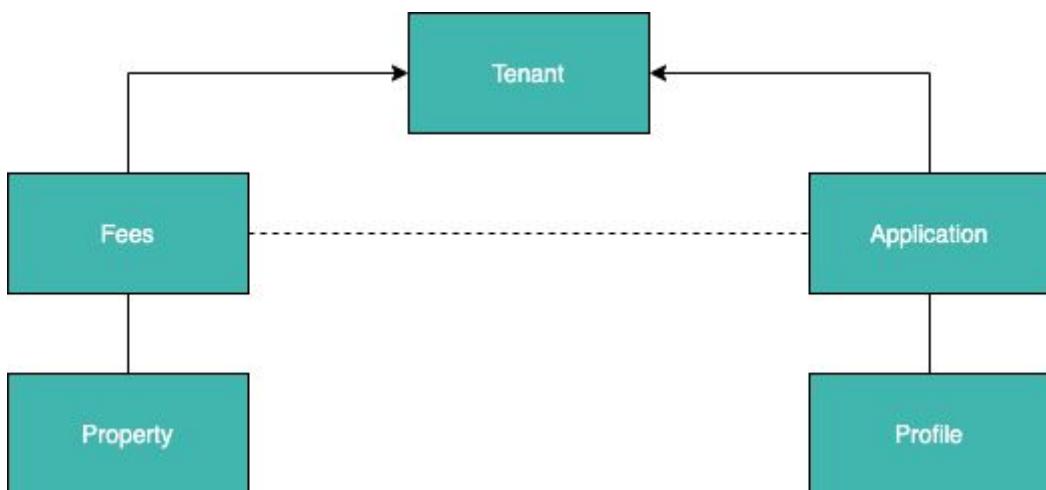




Designer - Distributed System Architecture



Designer - Human Interface Architecture

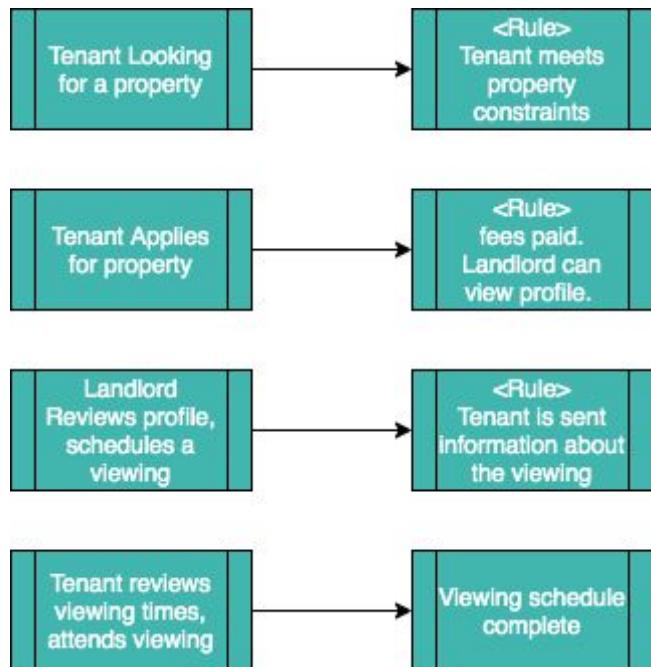




Designer - Processing Structure

Apply for property, attend viewing	1min	2min	3min	4min	5min	6min	7min	8min	9min
Register on RentSpot									
Upload Identification and information									
Search for a listed property									
Add Guarantor									
Meet all the requirements									
Apply for listing									
Receive viewing time									
Attend the scheduled viewing									

Designer - Rule Design





Performance Requirements

A functional version of RentSpot that is fit for property rental search.

Tenants will be provided with information about a property upon a search query

Landlords will be provided with information about tenant upon property application

Information displayed about users/properties will be assumed to be correct

Users information will be stored on their individual profiles and will be accessible for future house applications or tailored searches.

Users will not expect to meet any errors upon registration to RentSpot.

Users will be able to apply for a property if they meet the requirements.

Users are guaranteed a viewing if they meet the requirements.

Technical Challenges

During the development stage of our project. We were faced with some technical challenges as this was our first time developing an application from a business idea into a fully working prototype. Both underestimated how long it would take to develop our prototype. Countless hours were spent on different tutorials and Django documentation to try to learn and understand how we should go about implementing the code and logic that would allow us to build the prototype that we had in mind. There are many features in our prototype that were challenging to implement. Schedule viewing function and Add A Guarantor were definitely the most time consuming, but we couldn't be happier with the outcome as we got to implement all the functionality that we proposed.

Version control was a major challenge at the beginning of the project. We would often work on different features individually and if we tried to commit the code we would run into git merge conflicts. We both realise that this was due to the lack of experience working with version control software and this could be avoided, but we started to research good practices when using GIT. In order to avoid this challenge through the project we started using different branches for development that helped us to avoid this challenge in the future stages of the project and the loss of code when there was a conflict in our master repository.

Deployment was another technical challenge that we came across towards the end of our project lifecycle. Enough research wasn't complete in order to understand what it actually takes to deploy a web application. We quickly realized that using Django SQLite3 default database won't be sufficient for deployment. App Engine instances are read-only and therefore using SQLite wouldn't work long term for our scenario. We overcame this challenge by creating and using Cloud SQL PostgreSQL instance to connect to our application instead of using traditional SQLite3 databases.



Source code highlights

```
@login_required
def createListing(request):
    if request.method == 'POST':
        listing_form = CreatingListingForm(request.POST, request.FILES)
        image_form = ImageForm(request.POST, request.FILES)
        images = request.FILES.getlist('images')
        if listing_form.is_valid() and image_form.is_valid():
            link = listing_form.save(commit=False)
            link.landlord = request.user
            link.save()
            for i in images:
                image_instance = Property_Images(images=i, property=link)
                image_instance.save()
            messages.success(request, f'Your listing has been created!!')
            return redirect('/portal/', args=link.pk)
    else:
        listing_form = CreatingListingForm()
        link = listing_form
        image_form = ImageForm()

    return render(request, 'createListing.html', {'listing_form': link, 'image_form': image_form})
```

Create Listing function allows landlord users to create property listings on the platform. We are particularly proud of this code, as we couldn't figure out for quite some time on how to add in functionality that will allow users to upload multiple property images per listing. This function has two main forms that collect data from the users. **CreatingListingForm** collects all of the general data about property such as cover photo, property description, price, number of bedrooms and stores it within the **Properties** model. **ImageForm** allows users to input as many photos as they like ,which are then displayed in the property listing. The images that are uploaded by the landlord are run through a for loop to link them to a property object and the path to these images is stored separately within the **Property/Images** model.

```
<div class="carousel-inner text-center border border-dark">
    <div class="carousel-item active">
        
    </div>
    {% for p_images in property_images %}
        <div class="carousel-item">
            
        </div>
    {% endfor %}
```

Based on how many images were uploaded by the user these are then displayed in the image carousel in the property detail view. First image displayed in the property view by calling **carousel-item active** class that displays the image that is linked to the **Property** model view. For loop is created and images that are linked to the property within the **Property/Images** model are then displayed by the use of the **carousel-item class**.



```
@login_required
def viewProfile(request, pk, listing):
    landlord_user = request.user.landlord_profile
    tenant = Tenant_Profile.objects.get(pk=pk)
    tenantReview = Tenant_Reviews.objects.filter(tenant=tenant)
    property = Properties.objects.get(pk=listing)
    submitButton = ScheduleViewingForm(request.POST)
    if request.method == 'POST':
        link = submitButton.save(commit=False)
        link.landlord = landlord_user
        link.listing = property
        link.tenant = tenant
        link.save()
        messages.success(request, f'Your scheduled a viewing!')
        viewingApply = Property_Applications.objects.get(pk=pk)
        viewingApply.viewing_scheduled = True
        viewingApply.save()
        return redirect('portal')
    else:
        link = submitButton

    context = {...}
    return render(request, 'users/view_profile.html', context)
```

View Profile function allows landlords users to view profiles of the tenant users that have applied for their property listings. View profile functions allow landlords to view the tenant profile documents and they can also choose to schedule the viewing by the use of this function. Two additional arguments **pk** - primary key of the Tenant Profile and **listing** - listing ID of the property that tenants have applied for are passed through this function. Passing these listing ID arguments is especially important, because if a tenant decides to apply for more than one property - **property = Properties.objects.get(pk=listing)** method will return more than one property object. Only one property object is returned when calling this function because when the landlord decides to schedule a viewing with a tenant **link.listing = property** method can only list one property listing ID to one property applications object within **Property_Applications** model.

```
<div class="carousel-item active">
    <h5>Tenants References</h5>
    {% if tenant.references == '' %}
        <p class="text-secondary">
            
            {{tenant.tenant}} has not uploaded a reference to their profile yet</p>
    {% else %}
        <iframe src="{{ tenant.references.url }}" width="100%" height="500px"></iframe>
    {% endif %}
</div>
```

In the view profile function we used the same strategy to display documents as we did in property detail view, rather than using **** tags in the image carousel, we used **<iframes></iframes>** as it gave us the functionality to display documents on the tenant profile for landlord to review.



```
def guarantor(request):
    tenant_user = request.user.tenant_profile
    if request.method == 'POST':
        # add a guarantor form collects guarantor data such as guarantor salary
        addG = AddGuarantorForm(request.POST, request.FILES)
        if addG.is_valid():
            link = addG.save(commit=False)
            link.tenant = tenant_user
            link.save()
            messages.success(request, f"You've added a guarantor to your profile!")
            # once a guarantor is added to tenant profile
            # guarantors salary and tenants salary float fields are combined
            # both_salary within Tenant_Profile model then contains their salaries
            guarantor = Guarantor.objects.get(tenant=tenant_user).g_salary
            tenant = Tenant_Profile.objects.get(tenant=request.user)
            tenant.both_salary = tenant.salary + guarantor
            tenant.save()
            return redirect('/portal/')
    else:
        addG = AddGuarantorForm()
        link = addG
    return render(request, 'users/documents.html', {'addG': link})
```

A Guarantor function allows tenant users of the platform to add a Guarantor to their profile to expand the range of the properties that they can apply for and to strengthen their viewing application.

AddAGuarantor form collects Guarantor salary figures and two other documents. Once a guarantor is added to the tenant profile a new guarantor object is created within the Guarantor model. A tenant is limited to having one guarantor and this is achieved by Guarantor object being created based on Tenant Profile object and by using One-to-One relationship. Once a Guarantor object is created, **Guarantor.object.g_salary** and **Tenant_Profile.object.salary** are added together and that value is then stored in **Tenant_Profile.object.both_salary**.

```
# this function creates a profile Tenant or Landlord profile
@receiver(post_save, sender=User)
def create_profile(sender, instance, created, **kwargs):
    # once auth_user instance created, Tenant or Landlord profile is created off that
    if created:
        if instance.last_name == 'False':
            # creates a tenant profile
            Tenant_Profile.objects.create(tenant=instance)
        else:
            # creates a landlord profile
            Landlord_Profile.objects.create(landlord=instance)
```

Tenant and Landlord profiles are created based of **auth_user** instance that is created upon registration. We used **auth_user.last_name** to differentiate between landlords and tenants upon registration by adding **BooleanField** within **UserRegistrationForm** where value '**False**' == the generation of a Tenant Profile and '**True**' == Landlord Profile.



Interface rationale

When it came to designing RentSpot's UI we had spent some time thinking how we wanted our applications to look and both felt that our home listing page and property view pages would be the most important to get right. Using Invision Studio we were able to design a few interactive wireframes to get a better understanding of how a user will view our application. We had created a number of different design templates with different colour schemes to help figure out what was the best design template that would highlight all the navigation and make our listed images stand out. For our logo we used turquoise and white which would then be extended into the colour scheme of our design template and, to make sure our buttons were legible against this light scheme, we used dark grey.

Homepage design

For our homepage we gave it a white background with a turquoise navigation bar that extended throughout the site. RentSpots navigation bar sets its nav buttons based on the logged in user type : Anonymous , Landlords or Tenants. At the top of the page we have a container which displays a welcome message asking visitors to sign up along with our logo . We thought the use of a white background and advertisement tiles would make our landlords' listing images stand out better in comparison to the darker colour schemes we were originally considering using. We also thought that the use of the lighter colour scheme made all buttons and navigation clearer to the user.

Fig. Homepage design using InVision Studio



Property view design

The next page we felt that was central to the functionality of RentSpot and needed to be eye catching to our users was the ‘property view’ page. For our property view page we had to consider the placement of the advertisement itself and to make sure that the property reviews section was clear to the user. We decided that we would split a turquoise container in two sections where the listed property would be displayed on 60% of the container in a white media box and the reviews in the remainder. We felt that this was the most logical design to convey all the information to the user without having to scroll as it made all the media displayed stand out clearly and made use of the width we have on the browser.

RENTSPOT Rentals Search... Profile Create Listing Log out

05 Crestfield Dr.
Glasnevin D9
Dublin

Description:
Semi detached house with small garden, there is parking for two cars and is close to the 11 and 9 buses.

Bedrooms: 3 **Bathrooms:** 2

Rent: 1400 **Type:** House

SpotOn!

Property Reviews:

John Parker
Lovely property, easy to heat and Close to public transport.

Fig. Property view design using InVision Studio

Portal design

For our users portal we wanted to make sure that their relevant information was all displayed in one spot, clear and not in multiple pages. We have used a turquoise container for our users profile information to be displayed and accessed to update their profile. For both our user types portals we have split the page into two sections to display properties on the left section on a white background that format in and messages on the right with our trademark turquoise. Our idea was to minimise effort scrolling looking for related information and display it on one screen.

For our landlord users we have added all their properties in rows for the landlord to access and update their listing. On the right side of the page we have added ‘Property Applications’ that have been made to the landlords listing. This is so the applications will be where the landlord can see them quickly and can access the applicants account for review without the need for much navigation. On another turquoise container beneath we have added neat rows where the landlord can view all the viewing appointments they have made with tenant applicants.



For our tenant users we have added all the listed properties which they have applied for in rows where they can easily revisit the listing. On the right side of the portal for messages we have displayed all the upcoming viewing appointments that have been scheduled for them.

RENTSPOT Rentals Search... Profile Create Listing Log out

Bob Downey
Landlord
BobDowney@gmail.com

[Update Profile](#)

Active listings:

5 Artillery Place
Modern house situated 5 minutes from town
[View Property](#)

7 St.Bridgits sq.
Modern house situated 5 minutes from town
[View Property](#)

12 cutterly road
Modern house situated 5 minutes from town
[View Property](#)

Open Applications:

7 St.Bridgits sq.
Maksims Kompaniecs
I am interested in viewing your vacant property.

Up coming viewing appointments:

7 St.Bridgits sq.
You have scheduled a viewing with \$%\$%\$% at 16:00 on apr 31

Fig. Landlord portal design using InVision Studio

RENTSPOT Rentals Search... Profile Create Listing Log out

Anthony McBennet
Tenant
BobDowney@gmail.com

[Update Profile](#)

Open Applications:

5 Artillery Place
Modern house situated 5 minutes from town
[View Property](#)

7 St.Bridgits sq.
Modern house situated 5 minutes from town
[View Property](#)

12 cutterly road
Modern house situated 5 minutes from town
[View Property](#)

Upcoming Viewing:

7 St.Bridgits sq.
Congratulations! %%% has reviewed your profile and scheduled a viewing.
Your viewing is scheduled at 18:00 on April 31st.

Fig. Tenant profile design using InVision Studio



View profile design

For our landlord users we wanted to make the view profile function clear and easy to understand where to navigate to. We have made this page to resemble the users portal but it will display the tenants reference documents in a carousel operated by buttons. Once the landlord has reviewed the tenants uploaded references a schedule viewing box will appear where the landlord can enter the appointment in the form. On the right hand side of the page we have displayed the reviews that tenants have received from past landlords that have listed their properties with RentSpot. We chose this design because we felt that we would make users feel a sense of familiarity when using the view profile function as it is similar to the portal view. We also thought that the use of a '*reference carousel*' which leads onto the '*schedule viewing form*' was neat and all in one place design and maintained clarity for the user.

References:

This contract dated FEBRUARY 2010
Between LONG LAKE CAMP INC. (herein called employer) and MATTHEW FARRELLY
(hereinafter called employee) having at
September 2010

(1) Employer agrees to hire employee in capacity of MISC SPORTS/BUISNESS
COUNSELOR for the summer season of 2010, commencing June 2010, at a
salary of \$2,50 per for the entire season plus \$500 for travel expenses and \$100 for clothing expenses. Salaries will be
payable at the end of the camp season. Reasonable advances on account will be allowed. (2) Employee agrees to
perform his/her duties in a professional manner and to conduct himself/herself in a manner consistent with the general
spirit of the camp and to cooperate with the other employees and management in the operation of the
camp. Employee agrees to work in a spirit of cooperation and good will toward all persons employed by the employer
and interest are the welfare of the camp(s) and the camp. Under certain circumstances it may be necessary for the
employee to take on responsibilities other than those specifically hired for. Employer will be sole and final judge
as to the performance of employee's work and conduct and may terminate employment at any time in its sole
option of the employer. Employee's work and conduct warrants such dismissal. (3) Use or possession of illegal
drugs, alcohol, tobacco, or any other controlled substances or controlled substances by employee while on duty or while
on camp property. The purchase of any of the above items, and/or cigarettes for campers is not allowed, and
will result in immediate termination of employment. (4) Employee agrees to abide by all rules and regulations set forth
above. (4) If employee is absent from the camp without permission, employee shall be forfeited to salary for such
period. Such absence shall be considered a breach of this agreement and employee may be discharged
without notice. (5) If employee is absent from the camp for more than two days, such
loss time shall be charged against "time off". There will be 4 days off - beginning at 10 pm, the night before through
midnight the next day. (6) If employee is absent from the camp for more than four days, such loss time shall be charged
against the employer (minimum and kitchen staff excluded). (5) If, in case of unforeseen conditions, war, illness, government
orders, strikes, or other causes beyond the control of the employer, the employer may cancel the contract, or require
or to terminate the camp season before scheduled closing date, this contract shall automatically be terminated as of the
date of closing and employee shall be paid for actual time of service at camp only as provided herein. (6) If employer
will be unable to provide employment for employee due to reasons beyond the control of the employer, the employer
will be responsible for payment of wages to employee for the period of time that employee is unable to work. (7) The
Workers' Compensation Law. (7) If employee is unable to perform his or her duties for a period of time due to
employment related or non-employment related medical, surgical or dental need, the cost shall be the obligation of the employee
unless covered by the Workers' Compensation insurance. (8) Employee is not responsible for employer's
expenses.

Tenant Reviews:

John Parker
He was a sound lad , good tenant

Schedule a Viewing:

Would you like to schedule a viewing with this applicant?
Enter a time that suits you to host a viewing with \$\$\$\$ below:

Date:	April 26
Time:	18:00
<input type="button" value="Schedule Viewing"/>	

Tenant Reviews:

John Parker
He was a sound lad , good tenant

Fig. View profile and schedule viewings design using InVision Studio



References

- [1] RTB ANNUAL REPORT 2018 [online] Residential Tenancies Board. Available at: https://onestopshop.rtb.ie/images/uploads/general/RTB_Annual_Report_2018_Final.pdf
- [2] Rent Index 2019 [online] Residential Tenancies Board. Available at: https://onestopshop.rtb.ie/images/uploads/Comms%20and%20Research/RTB_Rent_Index_2019_Q4_%284%29_FINAL_WEB.pdf
- [3] PRS and the Irish Rental Market [online] Allied Irish Bank. Available at: <https://aib.ie/content/dam/aib/corporate/docs/real-estate-finance/aib-housing-supply-report-jul-2019.pdf>
- [4] The Daft.ie Rental Price Report [online] Daft.ie. Available at: <https://www.daft.ie/report/2019-Q4-rental-draftreport.pdf>
- [5] About us daft.ie [online] Daft.ie. Available at: <https://www.daft.ie/about/>
- [6] The Covid-19 crisis causes changes to rental supply across the country [online] Available at: <https://www.daft.ie/blog/the-covid-19-crisis-causes-changes-to-rental-supply-across-the-country/>
- [7] "Airbnb laws are being ignored, says TD" [online] Irish Examiner. Available at: <https://www.irishexaminer.com/breakingnews/ireland/airbnb-laws-are-being-ignored-says-td-963020.html>
- [8] Inside Airbnb: Dublin. [online] Inside Airbnb. Available at: <http://insideairbnb.com/dublin/>



Appendices

Appendix A - Matthew Farrelly Curriculum vitae

Matthew Farrelly

Newbridge, Kildare

+353-89-494-7806

Matthew.farrelly2018@gmail.com

<https://www.linkedin.com/in/matthew-farrelly-875813155/>

An IT Analyst who has proven ability to work out clients and organization's needs to increase productivity and ensure the smooth running of operations. My practical experience and Enterprise Computing degree allows me to tackle the IT issues companies experience every day. I see myself as very approachable and patient which definitely helps when testing, training users and creating process guides. I am completing my studies in Dublin in May and look forward to returning to New York and starting my full time employment.

TECHNICAL SKILLS

Python, SQL, Windows / MAC Operating Systems, MS Office – Excel, Word, PP, Power BI, BASH Commands, HTML, CSS, Bootstrap, Workflow Modeling, VMware, Linux, ArgoUML, Django, Git, GitHub, Agile, Jira, InVision , Visual Studio code, Anaconda, Confluence.

EXPERIENCE

Northern Trust

02/19 – 08/19

Data Analyst Intern

- Part of a 12 person strong Agile team in the business evolution lab who designed, developed, tested and configured new programs for the automation of manual tasks.
- Gathered and analysed business requirements from key stakeholders, then plan and implement solutions to improve employee/partners efficiency and external customer satisfaction e.g. reviewing manual computing tasks before automating.
- Developed tools for automating manual computing tasks and gathering data with Python scripts to present data as business intelligence and include in reports.
- Documented technical procedures and created step by step guides to assist both internal and external users with using the system, improving the overall level of support by reducing response times
- Used SQL to pull reports from the system for staff members and to manipulate data.

EDUCATION

Dublin City University, Ireland

2015 – 2020

B.Sc. in Enterprise Computing (Bachelor Honours Degree)

VOLUNTEER EXPERIENCE

Long Lake Camp Adventures

Summer 2016

Cabin Leader

Coordinated activities and supervised children aged between 10 and 16 at a traditional overnight camp in Albany, NY and worked with a large and diverse team to implement a safe and exciting program that the campers would enjoy over a 9-week period.

Ceoil Latton O'Rahillys

2014 – 2016

Musical Instrument Instructor

Committed two evenings a week to teaching young students in the local area how to play musical instruments. This involved providing music learning material and making the lessons as enjoyable as possible for all the students.



Appendix B - Maksims Kompanijecs Curriculum vitae

Maksims Kompanijecs
17 St John's Wood, Clontarf, Dublin 3, Co.Dublin
+353851086221
kompanijecs@gmail.com
<https://www.linkedin.com/in/maksims-kompanijecs-2ba215139/>

A soon to be graduate, who has proven ability to work as a part of a team and build relationships with different stakeholders within an organization to increase productivity and ensure smooth running of daily operations. My previous practical experience and degree have allowed me to understand how software and information systems can tackle real-world business problems that organizations face regularly. I'm a self-motivated individual who has a passion for exploring, learning and working with cutting-edge technologies. I'm graduating from Dublin City University with Bachelors of Science in Enterprise Computing and I'm currently looking for full-time opportunities upon graduation.

TECHNICAL SKILLS

Python, MySQL, HTML, CSS, Django, Flask, Git, Bootstrap, R, ArgoUML, JIRA Core, InVision Studio, LoadRunner, VMWare, G Suite, Google Data Studio, Google Analytics, Google Cloud Platform - Kubernetes, App Engine, Cloud SQL, AWS - S3

LANGUAGE SKILLS

English and Russian - fluent (speaking, reading, writing)
Latvian - intermediate (speaking, reading, writing)

EXPERIENCE

Colgate - Palmolive, Citywest Business Campus, Dublin, Ireland **01/19 - 09/19**
Business Analyst Intern

- Part of small EMEA Marketing, Analytics & eCommerce team
- Gathered and analysed business requirements from key stakeholders and planned and implemented solutions to improve efficiency and satisfaction between key business partners
- Documented technical procedures and created step by step guides to assist users on how to use different internal systems/tools
- Developed interactive dashboard using Google Data Studio and Google Analytics and presented findings to the team
- Organized and ran training session for key business partners within EMEA region
- Deployed applications into Google Cloud Platform using Google Kubernetes and App Engine environments
- Point of contact for team drive, user access and email group
- Coordinator of TY Programme - Colgate You Can Make A Difference Award Q1 winner
- Member of Live Better committee to promote healthy living in the Dublin office

EDUCATION

Dublin City University, Glasnevin, Dublin 9 **2015 - 2020**
Bachelor of Science (Hons) in Enterprise Computing

REFERENCES

Available on request



Appendix C - RentSpot logo



Appendix D - RentSpot icon



Appendix E - RentSpot prototype - Sign in/Register function

Join Today

Username*

Required. 150 characters or fewer. Letters, digits and @/./+/_- only.

Password*

Your password can't be too similar to your other personal information.
Your password must contain at least 8 characters.
Your password can't be a commonly used password.
Your password can't be entirely numeric.

Password confirmation*

Enter the same password as before, for verification.

Last name*

Landlord

Sign Up

Already Have An Account? [Sign In](#)



Appendix F - RentSpot prototype - Tenant Profile

Screenshot of the RentSpot tenant profile page.

The header includes the RENTSPOT logo, 'Rentals' link, 'Profile' and 'Logout' buttons.

The main area shows:

- A profile picture placeholder for 'tenant1'.
- User type: Tenant.
- Buttons: 'Update Profile' and 'Add A Guarantor'.
- A section titled 'Your Applications' with two items:
 - 17 St Johns Wood, Clontarf Property (Status: hello)
 - 63 Grangemore Drive Property (Status: I'd like to apply for this property. I have all document ready to go)
- A section titled 'Upcoming Property Viewings' showing one item: '17 St Johns Wood, Clontarf Property' (Status: Congratulations! landlord1 Landlord Profile has scheduled a viewing with you. Your viewing is on test at test).

Appendix G - RentSpot prototype - Browse Available Listings function

Screenshot of the RentSpot browse available listings page.

The header includes the RENTSPOT logo, 'Rentals' link, 'Profile' and 'Logout' buttons.

The main area shows:

- A welcome message: 'Welcome back to RentSpot, tenant1! Lets find the perfect spot for you!' with search filters for County, Type of property, No. Bedrooms, and No. Bathrooms, and a 'Search' button.
- A section titled 'Available Listings' displaying four property cards:
 - Donaghmede Dublin**: Nice property beside the bea ... €1500 p/m. [View Property](#)
 - Dublin 3 Dublin**: Good property in the city, a ... €1450 p/m. [View Property](#)
 - County Wexford Wexford**: Whitepines is an exclusive n ... €2400 p/m. [View Property](#)
 - Claremorris Mayo**: his home is wonderfully pres ... €1000 p/m. [View Property](#)



Appendix H - RentSpot prototype - View property function

The screenshot shows a property listing for "17 St Johns Wood, Clontarf". The listing includes a large image of a bright, modern bedroom with a double bed, a sofa, and a large window. Below the image are several details:

- Bed Rooms: 1
- Bathrooms: 1
- Property Description: Good property in the city, all major bus routes 5 min walk away.
- Property Location: 17 St Johns Wood, Clontarf, Dublin 3, Dublin.
- Rent Price: €1450
- Type: House

A yellow callout box states: "All applicants must have references to apply for this property. You meet this requirement ✓". Another yellow callout box states: "All applicants must have yearly income of equal or over €11 apply for this property. You meet this requirement ✓". At the bottom right is a "SpotOn" button.

Profile Logout

17 St Johns Wood, Clontarf

Bed Rooms: 1

Bathrooms: 1

Property Description: Good property in the city, all major bus routes 5 min walk away.

Property Location: 17 St Johns Wood, Clontarf, Dublin 3, Dublin.

Rent Price: €1450

Type: House

All applicants must have references to apply for this property.
You meet this requirement ✓

All applicants must have yearly income of equal or over €11 apply for this property.
You meet this requirement ✓

SpotOn

Appendix I - RentSpot prototype - Apply for property viewing

The screenshot shows an application form for a property viewing. At the top, a message says: "When you apply you agree to sharing your profile information with the property owner." Below this is a section titled "Property Application".

When you apply you agree to sharing your profile information with the property owner.

Property Application

App description*

This field is required.

Apply



Appendix J - RentSpot prototype - Add a Guarantor function

The screenshot shows a teal header bar with the RENTSPOT logo and 'Rentals' link on the left, and 'Profile' and 'Logout' links on the right. Below the header, a large white box contains the form fields. The form is titled 'Want to add a Guarantor to your profile?'. It includes three input fields: 'G salary*' (with a dropdown arrow), 'G salaryDoc' (with a 'Choose File' button and 'No file chosen' message), and 'G confirmation' (with a 'Choose File' button and 'No file chosen' message). A dark blue 'Add Guarantor' button is at the bottom.

Want to add a Guarantor to your profile?

G salary*

G salaryDoc

G confirmation

Add Guarantor

Appendix K - RentSpot prototype - Property Review function

The screenshot shows a teal header bar with the RENTSPOT logo and 'Rentals' link on the left, and 'Profile' and 'Logout' links on the right. Below the header, a white box contains the form fields. The form is titled 'Property Review'. It has a 'Review description*' field with a red border and a small red 'x' icon in the top right corner. A red error message 'This field is required.' is displayed below the field. A blue 'Apply' button is at the bottom.

Property Review

Review description*

This field is required.

Apply



Appendix L - RentSpot prototype - Landlord Portal function

The screenshot shows the RentSpot Landlord Portal interface. At the top, there's a header with the RENTSPOT logo, a 'Rentals' link, and user navigation links for 'Profile', 'Create Listing', and 'Logout'. Below the header, the user is identified as 'landlord1' with a profile picture placeholder and a 'Update Profile' button.

Your Active Listings: This section displays three property listings with small images, descriptions, and 'View Property' buttons.

- Courthouse Rd.
his home is wonderfully pres ...
€1000
[View Property](#)
- 63 Grangemore Drive
Nice property beside the bea ...
€1500
[View Property](#)
- 17 St Johns Wood, Clontarf
Good property in the city, a ...
€1450
[View Property](#)

New Applications: This sidebar lists four new application requests from tenants.

- 63 Grangemore Drive Property
tenant1 Tenant Profile
I'd like to apply for this property. I have all document ready to go
- 63 Grangemore Drive Property
tenant1 Tenant Profile
i'd like to apply for this property
- 17 St Johns Wood, Clontarf Property
tenant1 Tenant Profile
test
- 17 St Johns Wood, Clontarf Property
tenant1 Tenant Profile

Upcoming Viewing Appointments: This section lists five scheduled viewings with specific details.

- 17 St Johns Wood, Clontarf Property
You have scheduled a viewing with tenant1 Tenant Profile at test on test
- 17 St Johns Wood, Clontarf Property
You have scheduled a viewing with tenant2 Tenant Profile at 15:30 on 15/05/2020
- 17 St Johns Wood, Clontarf Property
You have scheduled a viewing with tenant2 Tenant Profile at 123123 on 1
- 63 Grangemore Drive Property
You have scheduled a viewing with tenant1 Tenant Profile at 15:30 on 21/04/2020
- 63 Grangemore Drive Property
You have scheduled a viewing with tenant1 Tenant Profile at 15:30 on 21/04/2020

Appendix M - RentSpot prototype - Landlord Portal function

The screenshot shows the RentSpot Tenant Profile page for 'tenant3'. The top header includes the RENTSPOT logo, a 'Rentals' link, and user navigation links for 'Profile', 'Create Listing', and 'Logout'. The user is identified as 'tenant3' with a profile picture placeholder and a yellow checkmark icon.

Profile Info: This section displays a 'Tenants Salary' field which shows a red 'X' and the message: 'tenant3 has not uploaded their payslips to their profile yet'.

Tenant Reviews: This section is currently empty, indicated by a large teal background area.



Appendix N - RentSpot prototype - Schedule Viewings function

The screenshot shows a user profile for "tenant1" with a yellow verification badge. The navigation bar includes "Profile", "Create Listing", and "Logout". Below the profile, there are tabs for "References", "Salary", "Savings", "H.A.P.", and "Schedule Viewing". A section titled "Profile Info:" contains a message asking if you want to schedule a viewing with this tenant. It includes fields for "Date*" and "Time*", both of which have validation errors ("This field is required."). A "Schedule a Viewing" button is present. To the right, a sidebar titled "Tenant Reviews:" shows a review from "landlord1" with a 5-star rating and the comment "good tenant, left the place spotless".

Appendix O - RentSpot prototype - Manage Property function

The screenshot shows a "Manage your Spot" form. The "Description*" field contains the text "Good property in the city, all major bus routes 5 min walk away". The "Cost of rent per month*" field is set to "1450". The "Tenant expected salary*" field is set to "11". A checkbox labeled "Reference required?" is checked. Below the form, there is a note about selecting an image, currently showing "house_preview/limerick.jpg" and a "Change:" link.



Appendix P - RentSpot prototype - Create Listing function

RENTSPOT Rentals Profile Create Listing Logout

 landlord1

Create New Listing

Select an image that describes this property best*

No file chosen

Street1*

Street2*

County*

Type of property*

Description*

No. Bedrooms*

No. Bathrooms*

Cost of rent per month*

Tenant expected salary*

Reference required?

Select property images*

No file chosen