CO350: Management and Business for Computing Engineers

FurnishAR

Business Plan

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Executive Summary

Buying furniture can be a very challenging task. Most of the time, a customer evaluates a piece

of furniture only by looking at a picture. Unfortunately, a picture may be a good indicator of

how a product will look in real life, but the customer get assigned the burden of deciding if it

will look good within his/her home environment. Right now, there is no easy way to make this

decision; customers often end up with a bad sales experience as they later decide the product

was not what they wanted. Others give up and do not buy furniture at all or hire interior

designers to do that job for them.

FurnishAR is a mobile app which utilizes cutting-edge, state of the art Augumented Reality

technologies to project furniture into customers' homes, allowing them to easily decide what

piece of furniture looks best in their own environment.

FurnishAR does not manufacture or sell furniture. Instead, our centralized app will:

• Provide the user with a list of furniture sold by world-class home improvement companies,

such as Furniture Village, Habitat and Wayfair.

• Allow the user to project, using the mobile phone's camera, a model of the selected object

in a location of his choosing.

• Give an amazing user experience, by allowing ltering of criteria based on type of furniture,

material, or company. A user will also be able to add objects to his/her wishlist and even

share it to friends.

• Finally, let the user buy the selected piece of furniture by redirecting him/her to the

selected furniture company's web page.

FurnishAR is a service that could revolutionize the home improvement industry. If interested

about being a part of it by investing, email us at invest@furnishar.com

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1 Overview

1.1 Introduction

Technology is part of almost every aspect of our lives and improves most interactions. We are more

connected than we have ever been, we have more knowledge than we ever have had and as a result

we have more time to do the things we love. However, some aspects of the world haven't yet taken

full advantage of the possibilities open to them. We believe that the furniture industry is one of

them.

Buying furniture can be a stressful time and this is heightened by the fact that the items are

cumbersome, and quite often people can buy furniture and not be happy with the way it looks in

the home. With the UK furniture market being worth 10.6billion in 2016 [1] , we believe there is

a fantastic opportunity to break in to and improve this market.

From our research we discovered that a lot of customers were unhappy with the experience received

from furniture companies, one particular customer writing angrily about how OakFurnitureLand

has a sales experience that `utterly sucks'[2]. A lot of this unhappiness seemed to arise from

travelling a long distance only to nd items out of stock, or having items delivered only to be

unhappy with the placement in the room. We believe that there is an opportunity to provide

customers with the ability to quickly and easily preview objects in their homes, using revolutionary

new technology - Augmented Reality.

Our idea is to provide this service to the businesses themselves. We will have a platform where

their furniture will exist. Customers can visit a companies website, select the furniture they wish

to preview and use our application to place and view the furniture in their room. We will provide

the business with all of the support and exposure they need in order for the customers to truly

benet from the new streamlined sales experience.

FurnishAR can have a large impact worldwide. The furniture market is expansive and uniform,

and it is likely that the introduction of our service will cause enough of a positive disruption to

accelerate the market.

1.2 Investment Summary

As explained in detailed in the following sections, FurnishAR will initially focus in development

and customer acquisition, and as a result we do not expect to turn a signicant prot until after

our rst years of operations. We therefore require a total investment of £620000 pounds for the

rst three years, for which we are willing to o  
er 25% equity in the company.

We propose that we hold two investment rounds. A seed funding round for £200000, which will

allow us to develop our product, validate our idea and nd our rst customers, giving us a short

runway of six months. For this initial seed funding we will o  
er 10% of equity. By the end of

our rst six months of operations, we will hold a second investment round with the goal of raising

£420000 for another 15% of the company. This second investment will fund our growth for the

next 2 years of operations.

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Of course, we are always open to other investment plans so please contact us if you are interested

in investing.

2 Market

This business plan focuses on the UK market, however we expect the furniture markets in the rest

of the western developed world to have similar characteristics.

The UK furniture market had revenues of £10.6 Billion in 2016. It is growing at annual rate of

about 2%, which is not very high compared to the UK's GDP growth rate. However, there is data

to suggest that furniture buyers are changing, and the way furniture is bought is changing with

them. Firstly, the young adult segment is the fastest growing customer segment with an annual

growth rate of 6%. Additionally, online sales grew by 10.5% [7] in 2016, and 8 out of 10 customers

have bought furniture online [8] at least once. The fact that more young people are buying furniture

than ever before combined with the growing use of the internet to buy furniture is an indication

that there is an opportunity to use new technologies to change the way people buy furniture even

more.

A characteristic of the furniture retail is that in general, it has huge prot margins compared to

other retail sectors. The average margin is around 40%, and can even be greater than 100% for

upper-end luxury items. These numbers reect the fact that beautiful, well-designed and tting

furniture is worth a lot more to the end customer than it costs to produce it.

2.1 Segmentation

We distinguish between the following market segments for the purpose of this business plan:

• High-end home furniture: Characterized by very high prot margins, luxury furniture

aimed at home owners is commonly produced in the UK or imported from Europe. It is sold

by outlets who often represent one manufacturer exclusively. A dining chair can cost £1200

or more.

• Middle range home furniture: Furniture in this space covers the gap between cheap and

expensive furniture. The brand name of the manufacturer is especially important, and a

dining chair can cost around £400-£700.

• Low end home furniture: Retailers in this segment sell furniture at lower prices. Naturally,

the quality decreases with the price, and items often require some assembly by the end

customer. The items sold must have broad appeal and high production volume. We consider

the popular furniture retailer IKEA to be targeting this segment. Students, young working

professionals and young couples are traditionally buying furniture from this range.

• Oce, workplace and non-home furniture: While there is nothing that prevents Fur-

nishAR from working in an oce environment, we will not target this segment initially. This

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is because the individuals who design workplace interiors are usually professional interior de-

signers who have less of a need for our product, since they know exactly what they need and

are already familiar with what is o  
ered by furniture retailers.

3 Propositions

3.1 The App

FurnishAR is a mobile app which uses Augmented Reality to project furniture in one's home. After

the user logs in, they see a landing page similar to the one in most marketplaces with trending and

recently added furniture items. By using the app they can navigate the app's catalog and select

an item to view. The projection screen, which is the core of the app, uses the smartphone's back

side camera to show the room on on the screen after projecting the furniture item. The user has

the option to add the item to their cart if they want to order. A mockup of the projection screen

can be found in the gure below.

Figure 1: A mockup of the AR projection screen

Aside from the core functionality described above, FurnishAR also has a a social aspect to it. The

user can "love" an item of furniture, adding it to her wishlist. A user can select to make her wishlist

public so that her friends can view it. Also, users can share items they like by making a post on

social media or by sending a message to particular people through the app.

The mobile domain is restricted in computer power, so optimisations must be done to ensure a

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smooth experience. We render scenes with the highest quality such that a smooth framerate can be

maintained. When saving images, this framerate concern is no longer there, so we up the quality

to max. This dynamic rendering process ensures an unparalleled level of smoothness throughout

the usage of the app, currently unseen in other products.

Users can handle positioning with regular-quality rendering, and get the highest quality view after

positioning has been done. These high quality images can be shared through social circles, giving

a better impression of the app.

3.2 Business

We believe we will gain revenue easily as companies will be enticed by our services. These services

include marketing through social networks, for businesses to gain consumer base (sharing wishlists,

images). There will also be advertising through the app as well as selling furniture (FurnishAR's

commission percentage depends on items value). We will also have a trial period for uncertain

furniture companies: businesses can try out and see their furniture in the app as well as superior

customer service and experience to rivals.

As a result we are selling ease of use and a potential larger consumer base to furniture companies.

The revenue itself will be from a monthly subscription model and commissions from furniture sales.

The percentage commission will depend on the base retail price for the item, and will be higher for

higher value items.

3.3 Investor

FurnishAR is attractive to potential investors as we seek to innovate the furniture buying experi-

ence, and become the best alternative to competitive apps. As a software business, it has very low

variable costs and can scale easily and cheaply as our customer base grows.

Initial investor money will go towards testing equipment, salaries, oces and advertising. A lot of

the costs will be handled by the furniture companies themselves, and therefore most of the investor

capital will be invested directly into the application.

4 Competitive Analysis

Other solutions exist on the market, but they are limited by various factors. For market analysis we

heavily utilised the Google Play Store, as Android is the most commonly installed OS for mobiles

in the UK [6]. Our research involved investigating the most popular applications on the Play Store,

trying them out extensively and looking at user reviews.

• Intiaro Interior Design[9]: The most promising of the existing apps reviewed. Limited by

low quality image generation and limited catalogue, particularly for biggest UK brands. User

reviews mentioned bugs, but none were found during our testing.

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• IKEA Catalogue[10]: Technologically advanced, but limited by association to a single

retailer (IKEA). Ran poorly on our low to mid-end phones, which is conrmed by user

reviews.

• iStaging - Interior Design[11]: Frequent glitches, slow loading times. User reviews consis-

tently negative, conrming our experience.

Additionally, the app Augmented Furniture[12] is a strong contender for best application for this

eld, however it is not available for android, signicantly hindering its widespread appeal.

Overall, the existing solutions are inhibited by poor performance, poor UX and limited catalogues.

Missing in all the apps tested is an end-to-end smooth experience of purchasing furniture. Users

would have to browse the furniture through the app and then buy elsewhere, which breaks the

users' ow. Another consistent problem was the constant rendering quality of the virtual furniture.

By rendering at the highest quality, the framerate is low; conversely by rendering at the lowest

quality, the app looks unpolished.

We believe that by improving on the existing solutions in key areas, we can push our product to

being more than just a gimmick.

4.1 IP

As there are existing solutions, fundamentally home augmented reality is not a unique idea. It is

also dicult to patent a mobile application. However as FurnishAR seeks to improve on all the

contenders we believe this will not hinder our success. We will be able to trademark our branding

and our particular implementation of AR which will have improved performance and UX compared

to competitors.

We can mitigate the lack of unique IP by forming close relationships with furniture companies to

ensure sales exclusivity for our app. Our technology team will ensure we will be keeping up with

competitors as well as testing new ideas competitors haven't implemented yet. This will be a key

competency for FurnishAR employees: coming up with innovative ideas.

5 Business Model

Our income will come from selling our services to furniture businesses. We will be investing in

improving our application and support services, as well as expanding the business and improving

di  
erentiation of the service provided to di  
erent kinds of businesses. Our customers will receive

certain access to be able to control the application in a simple way, and will also receive continuous

support services. We will provide a smooth sales experience and use experience and improve their

sales.

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6 Marketing Plan

6.1 Target Market

Our immediate target market is any furniture company wishing to improve their sales experience.

However, when we design our product, we in fact have to not only take the businesses in to

account, but also their potential customers. This means that our target market is twofold, where

the businesses are our target, but the design of the product is very much reliant on it beneting

their customers.

7 Financial Plan

A detailed overview of our nances can be seen here.

7.1 Costs

7.1.1 Cost of Acquisition

The cost of acquisition is equal to the advertising costs of our product. In 2018 we expect to reach

around 1,5 million downloads. From these downloads we expect to have a 10% conversion rate and

therefore 150,000 users buying furniture from our app. The cost of acquisition is calculated using

the formula given below:

CoA = (Advertising costs)/(Users acquired)

In 2018, CoA = (110,000) / (150,000) = £0.73.

7.1.2 Cost of Retention

Because of the huge increase of our customer base the demands are increased and since the compe-

tition will arise our product has to meet the expectations of the customers. For that reason, we will

hire skilled developers that will guarantee the quality of the app and increase the user experience

for our customers. On the other hand, we aim to reward reliable furniture vendors with discounts

and decrease of the charge that we apply per purchase.

7.1.3 Overall costs

The marketing costs will consume a signicant part of our funding during the rst year in order to

make our product known to the public. A similar rise in the marketing costs will occur in 2019 in

our attempt to expand to the European and American market.

Building an app that uses AR technology is a challenging task and it requires very skilful software

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engineers. Nowadays, a very skilful programmer in the UK gets a starting salary of £35,000. In

order to give the incentive for talented software engineers to join the team a starting salary of

£40,000 is given plus some equity.

Our company's oces are based in London and were are currently paying around 100,000 per

annum. The cost of the servers we are renting is expected to be around £500 in 2017 and £30,000

in 2018. Finally, we have legal expenses that are calculated to be £12,000 for 2017 and 2018.

7.2 Revenue

The calculation of our revenue has three main factors:

• ‑, the number of furniture providers use our service, who will contribute an annual fee de-

pending on their size as a company.

• A sale percentage p, which will be taken as a fee at each purchase. The rest of the purchase

money will go to the furniture company.

• The number of sales we do quarterly: s.

The formula that gives therefore the revenue for a given quarter is:

Revenueq = sq p avgFurnitureP rice + ‑ avgAnnualFee

After research in the market we have made an assumption that the average furniture price is 100.

Also, to have the results shown below, we have decided our average annual fee to be 20,000 and

our sale percentage fee to be 4%.

From that formula and we have derived that our revenues for the rst three years are going to be:

• Year 1: £116,800

• Year 2: £1,765,000

• Year 3 (half): £1,820,000

The gures below shows the increase in revenue and the increase in costs as time passes.

The calculated prot, which can be seen in more detail in gure 3, is therefore:

• Year 1: -£342,740

• Year 2: £301,200

• Year 3 (half): £619,600

A huge increase in prots is expected as the increase in costs is very low compared to the increase

in revenues. A peak in costs in late 2019 (as seen in gure 2) is there because of the advertising

campaign that will be launch when our product enters the European market.

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Figure 2: Revenue vs. Costs

8 Risk

In furniture retail, a lot of old companies that have been established for a long period of time.

While this is one of the reasons we're bringing modernisation to the market, it will be dicult to

penetrate the market share of such well established companies. Some companies hold a dominant

position and it is important to assess the e  
ect that these competitors may have on our business

goal.

8.1 Market risks

The success of our business is built around the success of the furniture industry. We have added a

level of complexity on top of initial purchasing methods that users will have to work with. We aim

for a large market, most of which have a smartphone, allowing for large uptake and and a strong

user base. This should continue to grow to ensure success.

8.1.1 Direct Contenders

Contenders and rival applications are a huge issue in terms of Risk. Since mobile applications

and application development is so easily accessible to large companies, they are free to contest our

market share. It is important that we strive to make an application that is both technically ground

breaking and unique enough to make its mark.

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Figure 3: Prots

8.1.2 Consumer mobile and tablet usage

FurnishAR depends on its users having access to mobile devices to run the application on. It

is important that users have consistent access to a device since it is all about improving user

experience and minimising e  
ort to the user. If consumers don't own or more importantly, don't

have the knowledge to operate a device, this causes issues for our user base. We need to make

sure that we alleviate possible risks by making the application as accessible and technically easy as

possible. We estimate that in a population of increasing technical users, this will be less and less

of a problem.

8.1.3 Changing customer needs

From conception to market, we need to make sure that user requirements won't change in such a

way that our application becomes redundant. In such a short period of time, we estimate this won't

be an issue. However, looking further into the future, consumers may no longer want to purchase

furniture at home. Customers in future markets may prefer visiting physical stores, possibly caused

by some innovation for in-store marketing.

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8.2 Other issues

A decrease in mobile usage may result in a smaller user base, forcing us to charge less to companies

for the same services. This change will also reect reduced costs to us due to a smaller user base.

There is also an increase in costs for competitive apps due to keep ahead in features/advertising.

8.3 Impact

Impact of incorrect assumption or change on revenue or costs

Variables Impact on Revenue Impact on Costs Probability

Competitive Apps (CA) 80% +60% 80%

Consumer Tablet/Phone Use (CT) 40% -20% 20%

Consumer Need changes (CN) 60% -25% 40%

CA + CT 20% +25% 5%

CA + CN 40% +25% 40%

CT + CN 20% >-25% 5%

CA + CT + CN <20% >+80% <5%

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9 Launch, Growth and Expansion

The app is currently in the beta phase of testing. The launch date has been set to the 1st of June

2017. Our growth plan is described in the following sections.

9.1 Pre-launch phase (present - 01/06/2017)

Our primary focus during this period is to complete the nal testing phase and use the feedback

from our beta users in order to nalize the product. Our beta testers consist of our rst furniture

providers and the team responsible for the development of the app. Also, we aim to start our

advertising campaign which will peak the week before the launch. Finally, we will start approaching

small local furniture businesses and pitch our product.

9.2 After-launch period (01/06/2017 - 01/01/2019)

This period is crucial for the success of the product. Immediately after the launch, the focus of

the development team will be to use the feedback from our users and resolve any issues that can

potentially a  
ect the user experience. We expect to continue our aggressive advertising campaign

by the end of 2017 where we will have established a customer base of thousands of users. In 2018, we

seek to grow more our customer base and start cooperating with large furniture provider branches

in the UK (e.g Argos). By the end of 2018, we aim to hire 20 people in the development and client

relationships sector and start being protable.

9.3 Expansion period 2019 and after

In 2019, we will make our rst steps in the big markets of the EU, particularly in Germany and

France. Next year, we will expand to the BENELUX countries and by the end of year to the

southern and eastern European countries. In the meantime we plan to enter the market of the US

by 2020 for which we aim to be more aggressive since the customer base is marginally bigger than

that of the other countries.

10 Development Process

The main value that we provide to both retailers and end customers comes from the quality of

our software. We therefore see ourselves more as a technology company than anything else. And

because quality software is only produced as a result of good and consistent development practices,

we feel it is worthwhile mentioning some ideas here.

At the core of our development process and methodology sit the Agile Development Principles,

according to which a software engineering team should be cross-functional, planning adaptively, and

getting feedback from the end users at regular intervals. This practice can be applied particularly

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well to an innovative software tool like FurnishAR, where nothing similar exists and therefore the

idea is to a large part invalidated, making regular feedback cycles even more critical.

More specically, after the rst few weeks we aim to nd a furniture retailer to act as a development

partner. They will then provide feedback at bi-weekly cycles for the most recent version of our app,

in exchange for being the rst to use our product with their customers for a discounted rate.

11 Team

Currently we are in the development stage with a team of seven software engineers with experience

in group projects and in industry. When we reach our deployment stage, we would need to hire for

many areas in the business including:

• Management

• Marketing

• Technology

• Application Design

11.1 Competency

When hiring and during the business lifetime, the main values of FurnishAR are described in the

tables below:

Competency Category 3 Most Relevant Competency 3-5 Most relevant behaviours

Core /

Organisational

Integrity

Keeps trade secrets

Is honest to the customer

Takes responsibility for achievements/mistakes

Quality

Control

Shows eagerness to produce best quality product

Drives for change and improvement

Holds self to high standard

Innovation

Is unafraid to come up with new ideas

Shows courage to break moulds

Tries to think outside the box

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Competency category 3 Most Relevant Competency 3-5 Most relevant behaviours

Behavioural

Cool-

headedness

Remains calm in stressful situations

Is able to form a coherent plan of action

Anticipates conict and helps to defuse it

Tolerance of

mistakes

Can admit own ignorance

O  
ers help to others when they need it

Accepts every team members strengths/weaknesses

Sense of

humour

Takes failure as a learning opportunity

Maintains friendly relations with customers

Willing to partake in company social events

Competency category 3 Most Relevant Competency 3-5 Most relevant behaviours

Professional

/ Functional

Quality of

work

Maintains good standard of work

Keeps to deadlines

Achieves results

Customer

Focus

Listens to customer needs

Follows a customer-oriented ethos

Maintains good customer communication

Adaptability

Keeps a dynamic plan of action

Adjusts to changes to plan

Keeps an open mind about what can change

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Competency category 3 Most Relevant Competency 3-5 Most relevant behaviours

Analytical

and

Technical

Technological

awareness

Uses all technology at their disposal

Researches further material on relevant technology

Willingness to attend technology conventions

Mastery of AR application making

Problem

Solving

Keeps a record of what they are doing

Constantly develops strategies to accomplish goals

Works with others to solve problems

Commitment

to continuous

learning

Seeks to learn about new technology

Aims to improve own expertise

Keeps up with growing industry

Reads up on furniture sales industry

12 Impact

12.1 Environmental Impact

As our business aims to drive away peoples wasted journeys to furniture shops, and wasted deliveries

to peoples homes who later change their minds, we believe that overall we will have a positive

environmental impact. Although this may be minimal, as our business is very technology based we

will not have a negative environmental impact.

As a business as a whole we will aim to be very environmentally conscious. We will do this by

keeping much of our work paper free and digital and by building any oces as green as possible.

12.2 Social Impact

There are a couple of ways in which we will a  
ect the furniture market socially. First, by allowing

people to shop more e  
ectively online using AR, the actual physical stores may be less busy.

However, this is unlikely as customers will probably also want to see potential furniture physically

before they buy it. In fact, we think that our application will actually drive away negative customers

from the stores and make shopping a more positive experience.

To expand on the latter point, customers may feel forced to shop for furniture in person due to

reasons previously discussed of it being cumbersome and expensive. They may be disappointed by

what they see when they arrive, thus inicting anger onto the sta  
 and a  
ecting the experience of

other customers. Our app will allow them to get an idea before they come and therefore improving

their whole experience.

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12.3 Employment Impact

At rst, the employment impact will be minimal due to us being a start up technology business.

We will need around 7 employees to get us up and running nancially, technologically and legally.

However, once we have started to make an impact in the business and decide to go global, we

will need a lot more employees to help us expand. For example, we will need people to help us

understand markets beyond the UK market.

As we deploy the app, we will need to hire more people of di  
erent disciplines: management, design,

marketing, envisioning after 5 years we will have 80 employees. As we are reducing the need for

physical stores, the jobs in those stores will be reduced. However furniture companies will need

more roles to handle communication with the FurnishAR team.

12.4 Economic Impact

As more people use FurnishAR, it will potentially drive more money into the furniture business.

This is due to people (especially people without the time to go to physical furniture shops) making

bigger furniture purchase decisions in their own home. This could also mean physical furniture

stores closing, so the furniture companies save money in rent, employees and maintenance of stores.

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