

FURNIT-SAVER

Smart Augmented and Virtual Reality Marketplace for Furniture Customisation

D5.2 Business case report

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1 Introduction

The FURNIT-SAVER project is business- and scenario-driven, with its validation activities fully focused on end-user and stakeholder interactions via 5 validation scenarios. These scenarios are a useful tool for demonstrating the significance of FURNIT-SAVER not only in terms of technology, but also in terms of providing an added value to its target users and an overall impact on the European furniture industry. We have chosen to use business cases in order to report on this impact.

A **business case** is a document providing a global view of the sum of benefits and costs associated with an investment or a project. It is a common decision making tool used constantly by managers in a variety of industrial sectors.

In the context of FURNIT-SAVER, the purpose of the business cases is two-fold:

- to measure and demonstrate **project impact** by means of quantifying the benefits experienced by our stakeholders
- to act as a **marketing tool**, showcasing benefits to potential clients after the project

It's important to keep in mind that our business cases are tightly linked to our application scenarios and pilots. For this reason, even though the development of the business cases is done in WP5, it very much depends on the requirements and application scenarios described by WP1 (D1.1 and D1.2) and on information collected during the pilots in WP4 (D4.2). We therefore refer the reader to project Deliverable 4.2 for the results of the technical validations, covering aspects such as usability and functionality.

Document structure

The document includes the following sections:

- Methodology: where we provide an overview of the process we followed in the preparation of the business cases
- Business case 1
- Business case 2
- Business case 3
- Business case 4
- Between-cases comparison
- Summary

2 Methodology and end-users

2.1 Methodology overview

Work on the business cases begun early on in the project, following the delivery of D1.1 and D1.2 which defined the project's use case scenarios and targeted users.

The following steps were involved:

1. **Benchmarking:** based on D1.1 and D1.2 the relevant partners produced a description of the current state of the relevant business scenarios and identified bottlenecks and economic metrics. Benchmarking was qualitative and quantitative:
 - **Qualitative:** Description of the current scenario: what is the flow of actions, which role holders within the company are involved, which stakeholders are involved, what are the main challenges and bottlenecks, etc. This was done in the form of story-telling and was presented as an annex in D5.3. The main relevant findings are summarised in each business case.
 - **Quantitative:** a list of critical business and economic indicators that best describe the use-case. For example, these could be related to Marketing, Sales, Production, effort and more. The business indicators are presented in Annex 1.
2. **Recording data:** during the validation activities the pilot partners were requested to record the relevant economic and business data through a set of questions incorporated into the validation questionnaires. The pilot partners were also requested to record any additional feedback of interest that the participants may have mentioned, such as explaining their answer to a certain question.
3. **Analysis:** the data collected during the validation activities was analysed to pinpoint the perceived benefits reported by the use case participants. Results were also analysed across use cases, in order to understand which user group values which feature or benefit more.
4. **Writing:** the conclusions and highlights are summarised in this report, also making an attempt to extrapolate and generalise the meaning of the results for the European furniture industry as a whole.

2.2 End user groups involved

A total of 176 people took part in the validation activities under 5 distinct scenarios. Each business case presented here is linked to one of these test scenarios and provides the perspective of a different end-user group of FURNIT-SAVER: domestic shoppers (shopping online or onsite), professional shoppers, furniture retailers, online furniture shops and

furniture manufacturers. While the data presented in each business case, represents the views and opinions of one group, it may affect additional stakeholders.

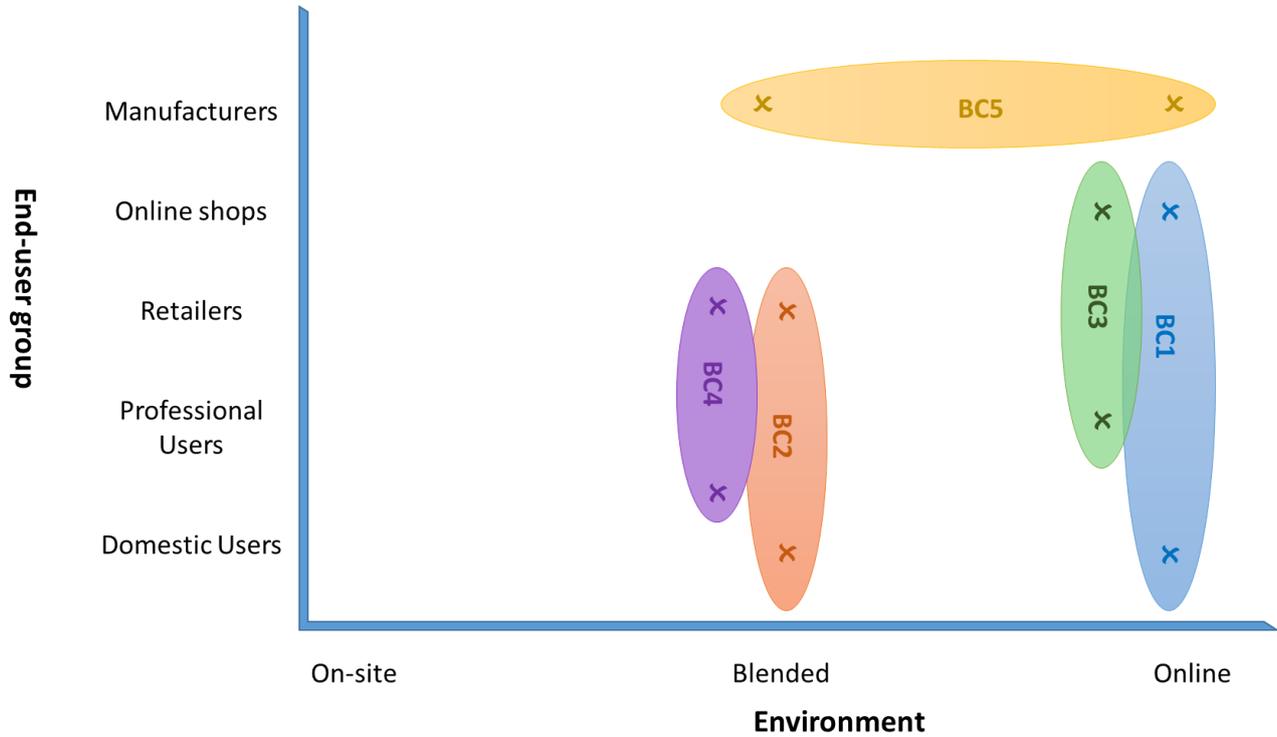


Figure 1: End users and business cases

3 Business case 1: online shopping for domestic clients

3.1 Overview

Based on work performed in WP1, use case 1 is defined as an online scenario wherein a domestic space is being furnished by a domestic user.

The scenario is performed purely online. This use case is focused on a user's shopping online for furniture for her/his home. The information presented in this business case represents the point of view of online shoppers and reflects on how using FURNIT-SAVER may impact online retention rates, purchase value and product returns.

3.2 Benchmarking

3.2.1 Main bottlenecks and challenges

1. The first problem, is that that of **product returns**: the cases of online shoppers who upon receiving the furniture decide that it is not to their liking or does not fit their expectations or their space. This in turn, lowers **client satisfaction** and the probability of clients shopping again at the store.
2. The second problem, is that of **conversion rate**, and getting hesitant users, to convert rather than abandon the cart.
3. The third problem is the need to increase the **total value of each order** and the **furniture/accessories order ratio**: the conversion rate of big furniture vs the cheaper deco and accessory items.

3.2.2 Relevant indicators tested

Indicator	Expected impact
Product returns	Sharp decrease in product return
Conversion rate	Increase in online users becoming online clients
Furniture/accessories order ratio	More sales of furniture versus design accessories

3.3 Results

3.3.1 Descriptive statistics

Sample and recruitment: 50 internet users were recruited by WWING and via the networks of the other partners (27 female, 23 male). The average age was 33, ranging from 20 to 76. Participants were from Spain and Slovenia.

Methodology: participants watched a set of videos presenting FURNIT-SAVER and were then given a login to access the system. Following interaction with the FURNIT-SAVER tools, participants were directed to an online survey.

3.3.2 Findings

Client retention

A number of key factors affect a buyer’s decision to shop again at the same store. Among them, we have examined client satisfaction and likelihood to return to the shop. In the following paragraph we discuss another important factor – that of product returns. Overall, our findings indicate that client retention rates will be positively affected by the introduction of FURNIT-SAVER:

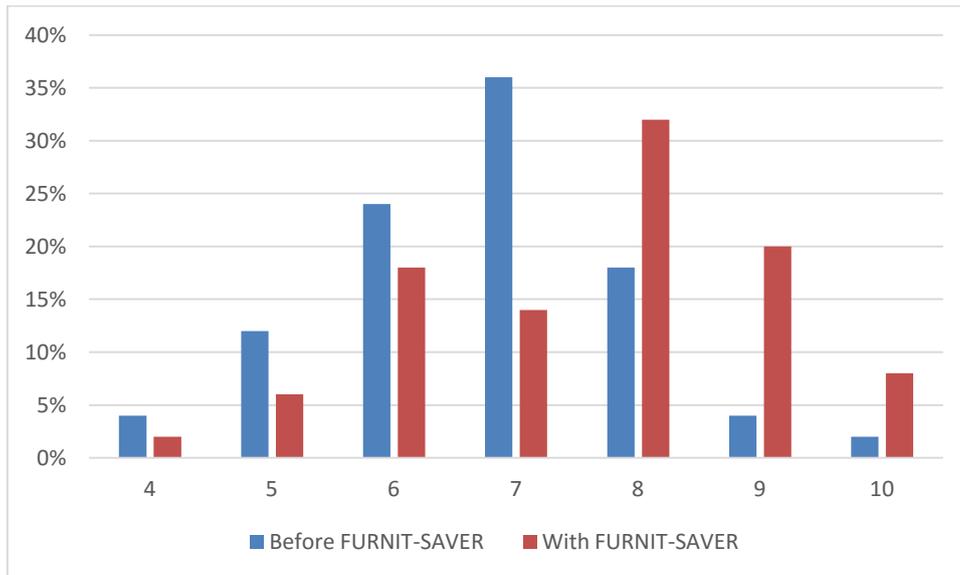


Figure 2: Client satisfaction before and after FURNIT-SAVER

In terms of **client satisfaction**, when asked about their satisfaction with current online shops, the average score given on a scale of 1-10 was 6.7. When asked to estimate their satisfaction with an online shop using FURNIT-SAVER, the score increased to 7.6, representing an 11,3% improvement. When looking those who initially rated the shop below 8.0/10 for client satisfaction (38 participants), then satisfaction score has risen from 6.2/10 to 7.2/10, a 16,3% increase.

In terms of **likelihood to return** to the shops, overall, participants were 11% more positive about shopping again in a shop once FURNIT-SAVER is used. 70% were explicitly positive about FURNIT-SAVER affecting their likelihood to return to the shop (see Figure 3). For these online shoppers, likelihood to return to the shop improves by 14% thanks to FURNIT-SAVER and their client satisfaction improves by 16%.

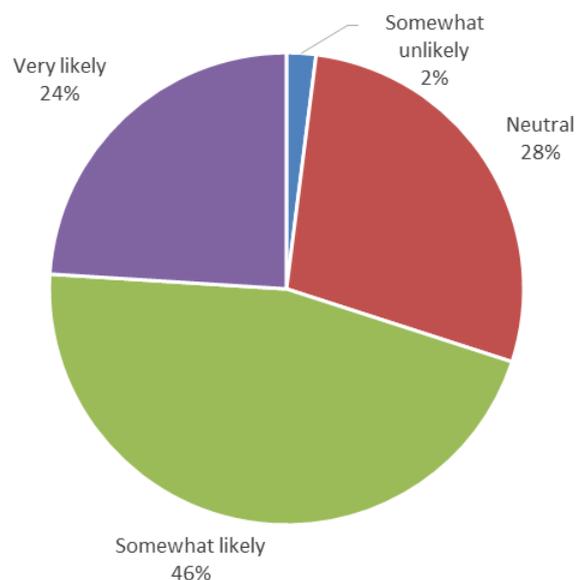


Figure 3: Likelihood of returning to the shop thanks to FURNIT-SAVER

Product returns

Product returns represent a great discomfort for online shoppers especially due to the associated delays and discouragement from shopping online. For some furniture pieces, shipping time may take several weeks or even months; the longer the waiting time, the greater the disappointment in cases the items do not fit the space or do not match the shopper's expectations.

From the point of view of online furniture shops, a high rate of product returns creates a logistic burden as well as a cash-flow problem; most online shops will provide shoppers the choice between a full money refund and a credit for future purchases. It is also detrimental in terms of marketing: product returns greatly decreases client retention and satisfaction rates and the probability of clients recommending the online shop to their peers.

Evidence from other eCommerce categories clearly show the positive influence of visualisation and customisation tools on product returns. For example, US retailer Running Warehouse reported a decrease of 23% in product returns after launching a virtual shoe fitting app¹. We therefore hypothesised that FURNIT-SAVER could potentially have a significant impact on online product returns.

When asked about their *last furniture purchase*, 18% of the participants reported their last furniture purchase was done online, versus 82% - in store. Of those who last bought in store, 17% reported they have returned an item, versus a staggering figure of 55% of those who bought online. This 38% difference is a good indication of the uncertainty facing online shoppers.

When generally asked about *recent furniture purchases*, 24% reported they have recently returned a furniture item they purchased. Of these, 83% agree that "Using FurnIT I will be more confident when buying a furniture and less likely to return it". Interestingly, as shown in **¡Error! No se encuentra el origen de la referencia.**, those who did not return a furniture item recently were less positive (38%) about FURNIT-SAVER's impact on product returns. Thus, we can say that FURNIT-SAVER has the potential to positively affect the majority of product returns and possibly reduce the figure from the current 24% to less than 5%¹.

¹ Importantly, the nature in which FURNIT-SAVER will affect product returns remains to be examined via large scale demonstrations. At the moment, we cannot clearly assert that a lower likelihood to return a product is equivalent to not returning a product.

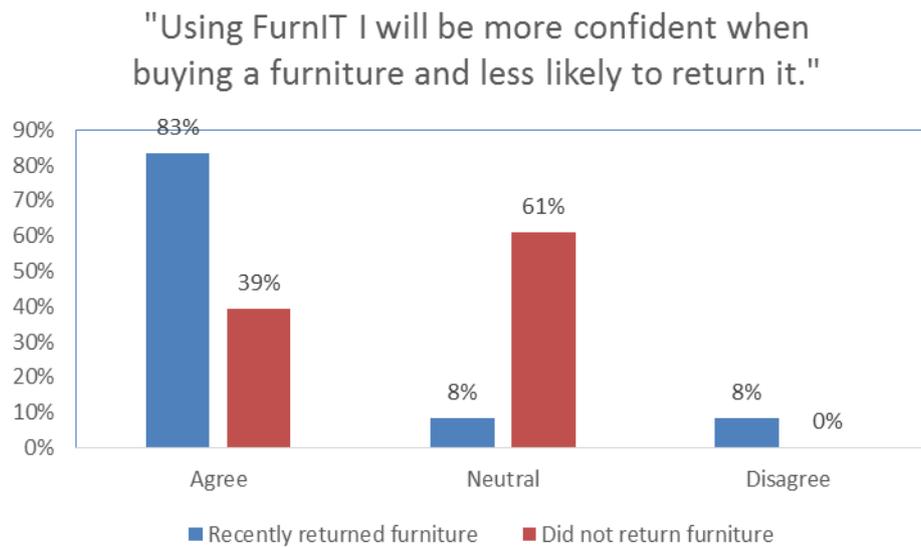


Figure 4: FURNIT-SAVER's potential impact on product return

Conversion rate and order value

One of the FURNIT-SAVER's unique features is that it is capable of providing profile-based recommendations to online shoppers of products in its database. For example, when a user is viewing a sofa, the recommender engine will suggest matching furniture and decorative items, such as a coffee table, cushions, curtains and others. Based on other success stories from the eCommerce sector, such as that of iGoDigital achieving a 23% increase in conversion rate, we hypothesised that the recommendations given by FURNIT-SAVER could increase conversion rates and order valueⁱⁱ.

Indeed, 66% of the pilot participants who have recently purchased furniture online say that with FURNIT-SAVER they are more likely to purchase more items, referring to both furniture and decoration items. On average these users have reported to normally purchase between 1-2 items (1.6). An increase of even 1 item per purchase, situating them in the 2-3 products range (2.6), may have a significant impact on online retailers. In terms of items sold, FURNIT-SAVER could bring about an increase of at least 62%. In terms of order value, according to recent data reporting an average value of 304€ per online furniture purchase, an increase of even 1 items could imply an additional estimated income of 190€ on average per orderⁱⁱⁱ. However, this estimation is based on published market figures. The exact economic impact of the increase in items sold on each business depends largely on the combination of products available on the database and on user preferences.

4 Business case 2: domestic users shopping in a blended environment

4.1 Overview

Based on work performed in WP1, use case 2 is defined as a blended/domestic scenario. This use case is focused on furnishing domestic spaces by a personal purchaser user with the support of a furniture retail shop expert.

Specifically, following the M4 meeting, use case 2 will focus on furnishing a domestic space and will include 3 different styles. Each style will include at least 4 types of tables, 4 types of chairs, 4 types of sofa, 4 types of tea table, 4 types of floor lamps and 4 types of other accessories.

4.2 Benchmarking

4.2.1 Main bottlenecks and challenges

- **Lack of visualisation tools in the shop.** Many retailers result to using printed catalogue and “pencil and paper” sketches of their clients’ designated space. Clients, on the other hand have difficulties imagining how a furniture would fit into their space.
- **Lack of customisation information:** as the possible customisations are not specified, the salesperson needs to contact the manufacturer each time to: 1) inquire about the feasibility of the customisation and delivery date, and 2) inquire about the cost. This introduces an additional step to the process, adding to the frustration of both the client and the salesperson.

4.2.2 Relevant indicators tested

Indicator	Expected impact
Client retention	Improvement in client satisfaction as well as likelihood to return
Product returns	Sharp decrease in product being returned to the shop
Conversion rate	Increase in online users becoming online clients
Order value	Increase in order value due to more items sold per order

4.3 Results

4.3.1 Descriptive statistics

Sample and recruitment: a total of 59 people took part in the pilot (18 male, 41 female). The average age was 43, ranging from 24 to 58. Participants were from Spain and Slovenia.

Participants were visitors of furniture shops who were approached by a FURNIT-SAVER representative as they finished their visit to the shop.

Methodology: participants watched a video presenting FURNIT-SAVER and then, with the help of a FURNIT-SAVER representative, signed into the system and engaged with it following the steps specified in the validation protocols. After that, participants were requested to answer a set of questions regarding their experience engaging with FURNIT-SAVER.

4.3.2 Findings

Client retention

As explained above, user satisfaction and likelihood to shop again at the store are major proxies for client retention.

- Our findings regarding **client satisfaction** in this respect were very positive: 98% of participants who took part in the pilot believe that their satisfaction with the services provided at the store will improve once FURNIT-SAVER is used. On average, user satisfaction is expected to rise from 7.9/10 to 9.1/10, representing a 15% increase in client satisfaction. However, if we consider only those who initially rated the shop below 8.0/10 for client satisfaction (20 participants), then satisfaction score has risen from 6.0/10 to 9.0/10, a 50% increase. Thus, we can argue that FURNIT-SAVER is especially effective at pleasing clients who are dissatisfied with the service given at the shop.
- With respect to **likelihood to return** to the shop, 96% answered that they are more likely to return to a store that uses FURNIT-SAVER. According to the subjective estimations of store visitors taking part in the pilot, on average, likelihood to return to the store increases by 20% thanks to FURNIT-SAVER.

Conversion rates and order value

For furniture retailers, the option to promote cross-sales between departments (furniture, textile, lamps, etc) is very attractive. Many retailers exhibit design concepts combining a number of furniture and decoration items, seeking to inspire their clients to purchase complementary items. FURNIT-SAVER's recommending engine, when used in-store, is aimed at helping salespeople provide better recommendations to their clients and be able to realistically visualise different furniture and decoration combination. Our hypothesis was that this feature when used in-store would help in increasing order value and items bought.

The average items per purchase were 2.1. 30% of the participants reported that they normally purchase one item at the store, while 68% reported to buy 2-3 products and 2% over 5 products. In line with our predictions, the majority of the participants (90%) estimated that the number of items they purchase is likely to increase when FURNIT-SAVER is used in the store.

Similarly to the previous business case, we have used data from the literature indicating the average purchase at a furniture store in Europe has a value of 150€ⁱⁱⁱ. Assuming that 90% of

the store shoppers buy 1 additional item per purchase, this implies an increase of over 70€ in in-store order value. The exact economic impact of the increase in items sold on each business depends largely on the combination of products available in the store and on its target audience.

Taking a gross look at the industry, according to 2010 data, the average annual revenue of SMEs in the furniture sector was 490k€ (this figure includes freelancers). Based on this data, the figure of average purchase value and our results, the introduction of FURNIT-SAVER may increase the average annual revenue of a furniture business to as much as 695k€, an increase of 42%.

Product returns

None of the participants in this pilot has reported to have recently returned a furniture item they have purchased. While this makes it difficult to assess the potential impact of FURNIT-SAVER on product returns, still, 95% agree or strongly agree that the statement that with FURNIT-SAVER they will be more confident when buying a furniture and less likely to return it. In summary, while we cannot present conclusive data, it seems that for the majority of customers, FURNIT-SAVER achieves the aim of reducing the uncertainty associated with buying furniture and decoration items.

5 Business case 3: professional user shopping online

5.1 Overview

Business case 3 analyses the results of an online use case where a professional user or a contract channel is looking to furnish a large office space or a hotel.

5.2 Benchmarking

5.2.1 Main bottlenecks and challenges

- **Lack of customisation information:** Lack of extensive visual information in project catalogues, as well as information about possible product adjustments.
- **Long time-to-order:** Lack of agile tools for creating the outline of space to be designed and for sharing with the final clients the proposed designs. This leads many designers to stick to the time consuming “pen and paper” method.

5.2.2 Relevant indicators tested

Indicator	Expected impact
Client retention	Improvement in client satisfaction as well as likelihood to return . In this case we also expected the final clients (client of the professional clients) to be happier with the service.
Product returns	Sharp decrease in products being returned by the end-users
Order value	Increase in order value due to more items sold per order
Time-to-order	An overall reduction in the time the professional spends until an order is placed

5.3 Results

5.3.1 Descriptive statistics

Sample and recruitment: a total of 20 people took part in the pilot (9 male, 11 female). The average age was 39, ranging from 22 to 54. Participants were from Slovenia.

Participants were professional clients of Slovenian manufacturers and shops Alples d.d., Murales d.d. and Gonzaga-Pro d.o.o.

Methodology: salespeople of the abovementioned companies engaged in a sales process with professional clients. The VR environment was designed following the client’s instructions and an AR marker was created to allow customer to visualize the design remotely using FurnIT AR app. After that, participants were requested to answer a set of questions regarding their experience engaging with FURNIT-SAVER.

5.3.2 Findings

Client satisfaction

We have explored 2 levels of client satisfaction: that of the professional client, and that of their own client. For example, an interior designer and the owner of the office being design. Importantly, the feedback was provided by the professional client and their client was not directly involved.

Our findings regarding **client satisfaction** of the professional user were positive: 65% of the participants in this pilot believe that their satisfaction with the services will improve once FURNIT-SAVER is used.

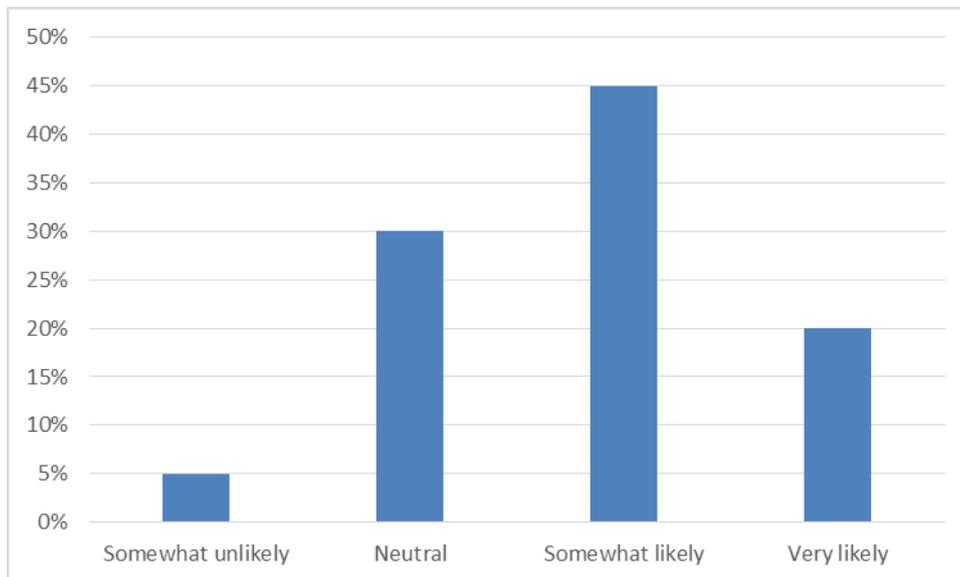


Figure 5: Will FURNIT-SAVER improve your client satisfaction?

On average, user satisfaction is expected to rise from 6,8/10 to 7,65/10, representing a 12,5% increase in client satisfaction. However, if we consider only those who initially rated the shop below 8.0/10 for client satisfaction (12 participants), then satisfaction score has risen from 5.6/10 to 6.9/10, a 24% increase. Thus, as seen with domestic users, we can argue that FURNIT-SAVER is especially effective at pleasing clients who are dissatisfied with the service given at the online shop.

When asked to evaluate how FURNIT-SAVER will affect the satisfaction of their own clients, 85% of participant responded there will be a positive change, while the rest were neutral. Overall, professional clients expected there will be a slight improvement of 6% in client satisfaction.

Client retention

On average, participants ranked their likelihood to shop again at the store at 7,2 out of 10. 75% thought it was somewhat likely or very likely that their likelihood to return improves

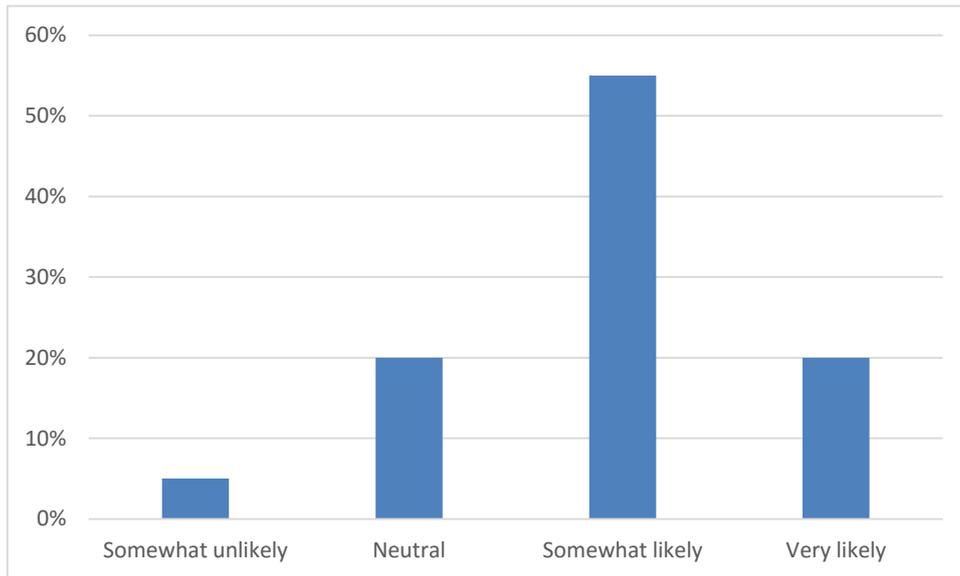


Figure 6: Will FURNIT-SAVER improve likelihood to shop again at this store?

when FURNIT-SAVER is used in the shop.

When participants were asked to quantify the new likelihood of returning to the store, improvement was very small: the average score went up from 7,2 to 7,3. However, if we look at the segment of clients who ranked their initial likelihood to return to the shop at less than 8/10 (8 participants), FURNIT-SAVER will improve their average likelihood to return to the shop by 16% (from 5,37 to 6,25).

Product returns

One of FURNIT-SAVER's intentions was for professional users to be able to showcase a realistic design to their clients using the FURNIT-SAVER app and within the designated space to be designed. Similarly to Business Case 1, we hypothesised that for clients mainly shopping online, our VR/AR tools will significantly reduce the current uncertainty in the purchase process and thus reduce product returns.

However, it seems that the issue of product returns is not a crucial one for professional users as only 10% of the pilot participants reported to have returned a product they bought in the past 2 years. 75% reported they have not returned any furniture in the past 2 years, while the rest preferred not to answer or claimed they bought no furniture.

Still, when asked if with FURNIT-SAVER their clients are happy with the furniture and decoration items delivered and are less likely to return them, 30% answered positively, but

noted a very small quantitative change. Thus, we see some professional users recognise FURNIT-SAVER may have a positive, yet small, impact on product returns.

Order value

Next, we wanted to know if via FURNIT-SAVER professional users expect to see an improvement in order values, especially due to purchasing more items recommended to them by the system. 50% of participants agreed that FURNIT-SAVER is likely or to have a positive impact on purchasing more furniture and decoration items.

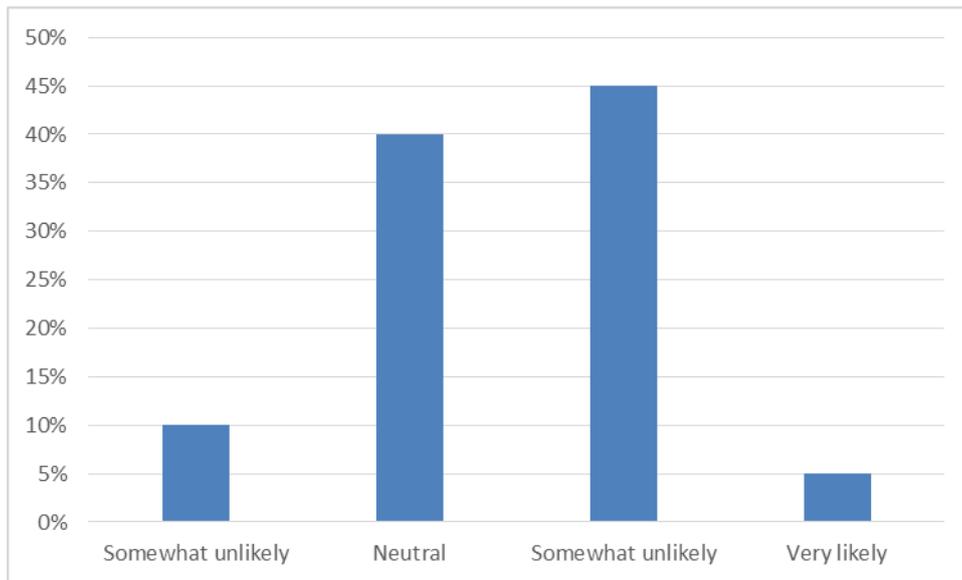


Figure 7: FURNIT-SAVER's likelihood to increase number of items per order

Time-to-order

In many cases professional users are intermediary between their own clients and furniture retailers and manufacturers. As such, they are constantly requested to make inquiries and request information regarding the products themselves, as well as possible adjustments. FURNIT-SAVER can potentially ease this communication by bringing all stakeholders together on the same platform and by defining modification parameters to furniture items. We believe that this, together with saving much of the time professional users currently spend on creating room plans and presenting the final designs to their clients, will bring about an important decrease in the time professional users currently spend in an attempt to place an order.

Interestingly, there were mixed opinions regarding this matter. 35% agreed or strongly agreed that FURNIT-SAVER will decrease time to order, while 35% were neutral and 30% disagreed.

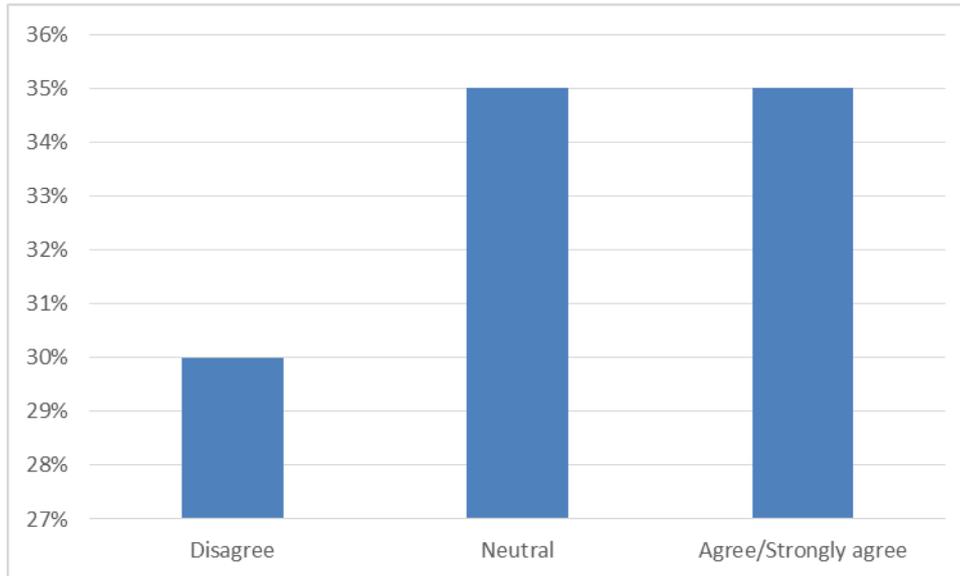


Figure 8: FURNIT-SAVER's likelihood to decrease time of order

However, when asked to quantify this change, 95% chose a change range, rather than answering “on change”. The data in **¡Error! No se encuentra el origen de la referencia.** summarises the expected reduction in time-to-order. If we choose a middle point in each range, the average time-savings indicated by the sample was of approximately 11,5%. As we did not explore in detail the causes of delays in time-to-order, we can only speculate that some delays are caused by factors that cannot be controlled by FURNIT-SAVER, such as end-client decision making processes. Still, an average saving of over 10% of time-to-order can be translated into a more agile sales process and well as for cost savings and higher efficiency of professional clients. This finding means, for example, that thanks to the time saved by FURNIT-SAVER, professional user might be able to take on more clients and thus significantly increase her capacity and income.

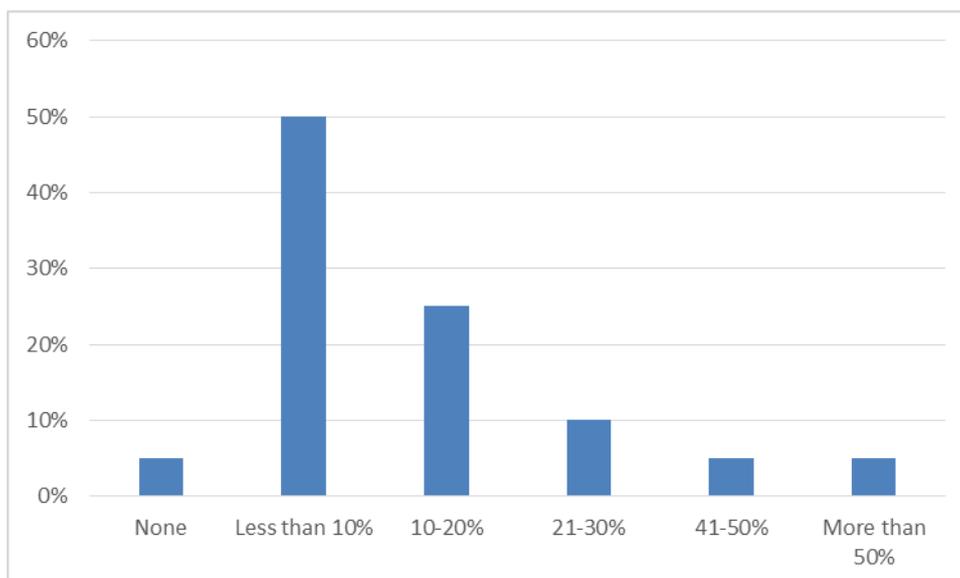


Figure 9: how much of the time you currently spend in the shopping and order process will be saved thanks to FURNIT-SAVER?

6 Business case 4: professional user shopping in a blended environment

6.1 Overview

Based on work performed in WP1, use case 4 is defined as a blended/professional scenario. This use case is focused on furnishing office spaces by a professional user with the support of a retail shop.

6.2 Benchmarking

6.2.1 Main bottlenecks and challenges

- **Long time-to-order:** due to multiple stakeholders involved, the decision making process is slow and overall time-consuming to the salesperson, designer and manufacturer.
- **Lack of customisation information:** as the possible customisations are not specified, the salesperson needs to contact the manufacturer each time to: 1) inquire about the feasibility of the customisation, and 2) inquire about the cost. This adds an additional step to the process, adding to the long time-to-order.
- **Lack of automatic layout and visualisation tools:** the designer has to manually insert the furniture into the layout. However, even when doing so, there is no possibility to visualise how some furniture will look in the space following customisation. This presents a problem to the end-user (not knowing exactly what they are paying for) and may even result in the end-user returning customised goods.

6.2.2 Relevant indicators tested

Indicator	Expected impact
Client retention	Improvement in client satisfaction as well as likelihood to return . In this case we also expected the final clients (client of the professional clients) to be happier with the service.
Product returns	Sharp decrease in products being returned by the end-users
Order value	Increase in order value due to more items sold per order
Time-to-order	An overall reduction in the time the professional spends until an order is placed

6.3 Results

6.3.1 Descriptive statistics

Sample and recruitment: 21 professional clients of the company Murales from Ljutomer, Slovenia, recruited by WIC to take part in this pilot (9 male, 12 female). The average age was 32, ranging from 23 to 45.

Methodology: salespeople of the abovementioned companies engaged in a sales process with professional clients. The VR environment was designed following the client's instructions and an AR marker was created to allow customer to visualize the design remotely using FurnIT AR app. After that, participants were requested to answer a set of questions regarding their experience engaging with FURNIT-SAVER.

6.3.2 Findings

Client satisfaction

As in business case 3, we have explored here 2 levels of client satisfaction: that of the professional client, and that of their own client.

When asked if FURNIT-SAVER will improve their own satisfaction from the service given on-site at the shop, 81% answered positively. The average user satisfaction given on a scale of 1-10 is 6,9 at present, and estimated to increase to 7,7 after the introduction of FURNIT-SAVER, a 12% increase. For those who initially rated their satisfaction lower than 8/10, the increase is a more dramatic one: of 19%. In **¡Error! No se encuentra el origen de la referencia.** the shift in client satisfaction rates are visible as the red bars (client satisfaction with FURNIT-SAVER) are showing a positive trend towards the right (higher scores) as compared to the blue bars (client satisfaction before FURNIT-SAVER).

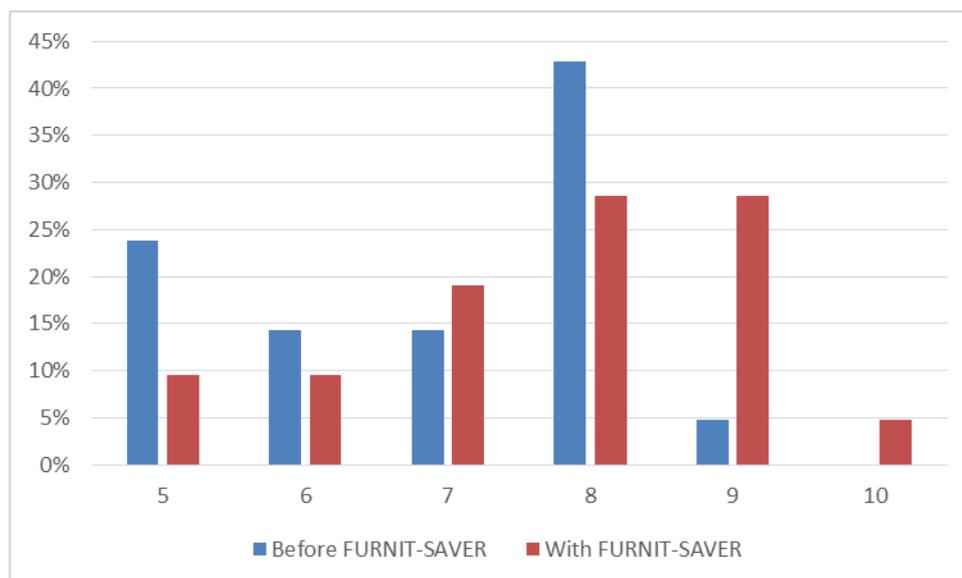


Figure 10: expected change in client satisfaction thanks to FURNIT-SAVER

Next, when asked to estimate the effect FURNIT-SAVER will have on the satisfaction of their clients (hotel owners, house owners, offices, etc), 86% replied that it is likely to improve. The average client satisfaction is expected to increase by 9%: from 6,93 to 7,57 out of 10.

Client retention

When asked about the likelihood of shopping again at the store thanks to FURNIT-SAVER, while most participants (86%) said FURNIT-SAVER will positively affect likelihood to return, the estimated improvement is a small one, only 4,6%.

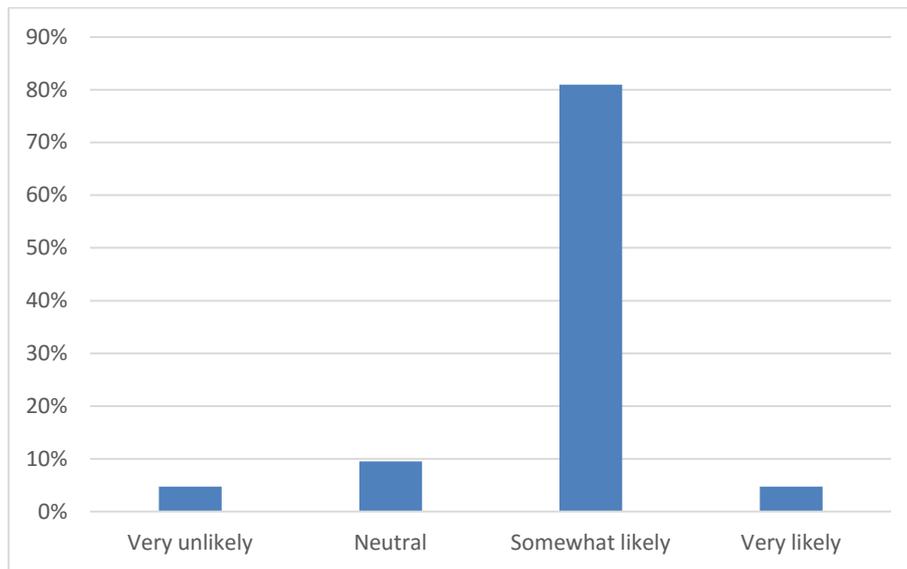


Figure 11: Likelihood of returning to the shop thanks to FURNIT-SAVER?

Product returns

Of the 21 participants, none have indicated having returned any purchases furniture and other design items in the past 2 years. In line with these results, it is not surprising that only 14% thought FURNIT-SAVER could have a positive impact on reducing product returns. Nonetheless, the impact foreseen by these participants is of less than 10% reduction with respect to the current figure.

Order value

Next, we wanted to examine whether professional users thought the FURNIT-SAVER tools, and especially the generated recommendations, could lead to an increase in order value. The majority (76%) thought it was somewhat likely or very likely that using FURNIT-SAVER they will purchase more items. This finding indicates that professional users shopping in

store appreciate the recommender engine and believe they might purchase more items thanks to FURNIT-SAVER, thus leading to an increase of order value.

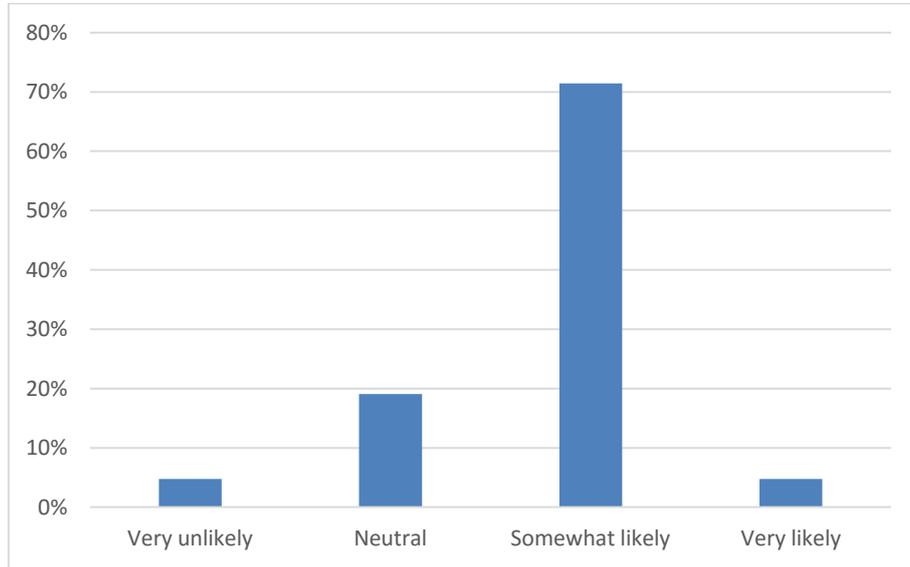


Figure 12: How likely is it that using FurnIT you would purchase more items?

Time-to-order

To our disappointment, only 19% of professional users thought FURNIT-SAVER will help them shorten the time they spend shopping for furniture and design accessories for their clients and when trying to get clients' approval prior to placing an order. 29% disagreed that FURNIT-SAVER will bring about this impact, while the majority (52%) held a neutral opinion.

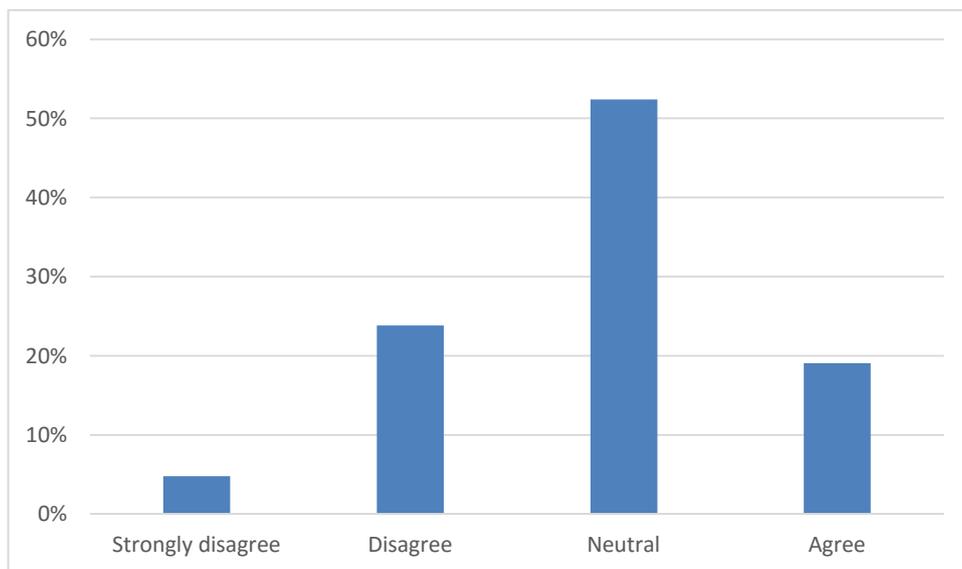


Figure 13: Can FURNIT-SAVER shorten time spent shopping for your clients and obtaining approval prior to placing an order?

However, when asked to quantify the change in time spend on an order thanks to FURNIT-SAVER, 52% chose a change margin, rather than answering “no change”. If we chose the middle value in each of the change ranges, then the average change indicated was a reduction of 4,15% in time-to-order. While this is a relatively small impact, it may still be significant for some professional users.

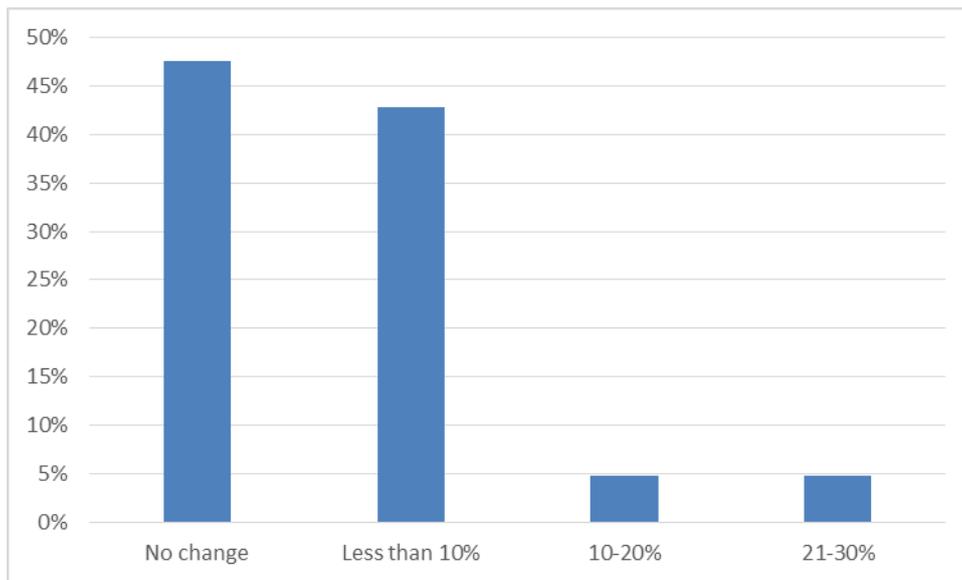


Figure 14: how much of the time you currently spend in the shopping and order process will be saved thanks to FURNIT-SAVER?

7 Business case 5: Manufacturers making their designs available via FURNIT-SAVER

7.1 Overview

While it was not initially foreseen, during the project we have recognised the need to explore the impact on furniture manufacturers and their motivation to collaborate with the platform: upload 3D designs, specify parameters for modifications, etc. Therefore, Business case 5 is defined as a case where a manufacturer interacts with FURNIT-SAVER to upload and sell their designs to retailers and domestic as well as professional clients.

7.2 Benchmarking

7.2.1 Main bottlenecks and challenges

- **Long time-to-order:** due to multiple stakeholders involved, the decision making process is slow and overall time-consuming to the salesperson, designer and manufacturer.
- **Lack of customisation information:** as the possible customisations are not specified, the salesperson needs to contact the manufacturer each time to: 1) inquire about the feasibility of the customisation, and 2) inquire about the cost. This adds an additional step to the process, adding to the long time-to-order.
- **Costly support materials:** At present, manufacturers spend large amount of money on the production, printing and shipping of support material such as catalogues.

7.2.2 Relevant indicators tested

Indicator	Expected impact
Product returns	Sharp decrease in products being returned by the end-users
Order value	Increase in order value due to more items sold per order
Time-to-order	An overall reduction in the time the professional spends until an order is placed
Cost of support material	Less support material, such as printed catalogues, will be needed and so the associated costs will decrease

7.3 Results

7.3.1 Descriptive statistics

Sample and recruitment: 26 individuals representing furniture manufacturers were recruited by CENFIM and WIC to take part in this pilot (21 male, 5 female). The average age was 45, ranging from 25 to 58. Participants were from Spain and Slovenia. All manufacturers taking part in this business case were SMEs.

Methodology: the technology was presented to the participants in a face-to-face meeting by a FURNIT-SAVER representative. They received an overview of the functionalities FURNIT-SAVER offers end-users, such as domestic and professional shoppers and were shown the possibilities of the virtual and augmented reality environments. Next, manufacturers could interact with their dedicated interface in the VR environment and were specifically trained on how to upload their furniture models onto the platform. Next, manufacturers were asked to complete the validation questionnaire, including a part dedicated to business indicators of interest.

7.3.2 Findings

As discussed at length in D4.2, furniture manufacturers have had disappointing experiences with ICT tools developed from the sector and are therefore somewhat suspicious and resistant to change.

Product returns

One of the major advantages of FURNIT-SAVER is that of minimising the uncertainty of purchasing furniture either online or in-store by showing potential shoppers a realistic view of how the items would look in their space. The resulting benefit of reducing this uncertainty, is that of decreasing product returns. However, while in the previous business cases we have seen that product returns are a concern for retailers and a discomfort for shoppers, we were uncertain as per the relevance of this challenge to manufacturers.

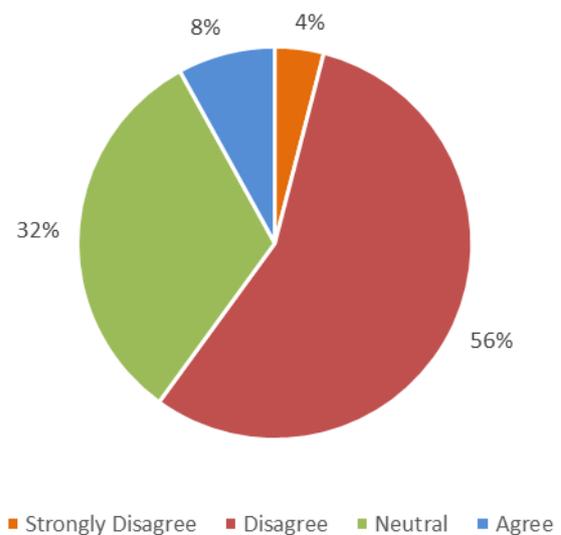


Figure 15: Is product return a concern for your business?

Interestingly, our results show that for most manufacturers (60%) product returns are not a concern. Only 8% agreed that product return is a concern for their business, while 32% maintained a neutral position. We could not find any demographic data indicating that the businesses with a product return problem were any different from the others. In light of this data, it is not surprising that when asked to quantify the impact on product returns, only 15% estimated a change of very small impact. As seen in Figure 16, the category of 10-20% product return rate disappears thanks to FURNIT-SAVER and the “no returns” category slightly grows.

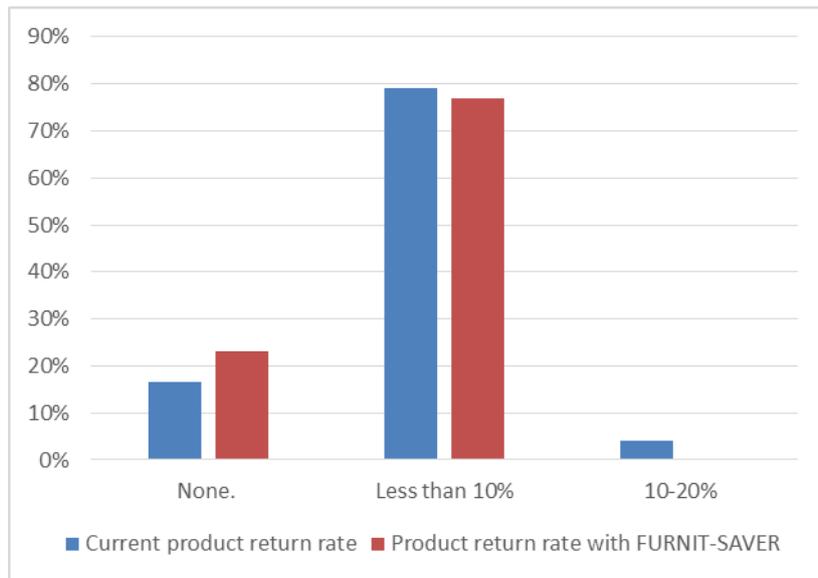


Figure 16: FURNIT-SAVER's impact on product return rate

The participants were specifically asked to elaborate more on product returns and why it poses no concern to them. Most have said that they go through long design discussions with retailers and professional clients to ensure the products match their expectations. In some cases they may even be commissioned to produce furniture by the designing party, thus minimising the risk even more. Moreover, while most manufacturers acknowledge they do have product returns due to uncontrollable factors, they claim it is a small fraction that poses no risk or a challenge to their business. Most ordinary returns are due to product defects, damages caused during shipping and mounting and manufacturing errors. For this reason, manufacturers did not consider our proposition for decreasing product returns to be very relevant or interesting.

Order value

FURNIT-SAVER's recommender engine is expected to encourage clients to purchase more items, as they will be recommended additional items that match their style and items in their shopping cart. We therefore expect FURNIT-SAVER to increase order value. However, when manufacturers were asked about this, 70% expected no positive change in order value. Of the other 30%, the vast majority (87,5%) expected a marginal increase of less than 10% in order value. This may indicate that manufacturers do not understand how in the long run FURNIT-SAVER could increase order value, or they did not understand the functionality of the recommender engine. However, an alternative interpretation is that manufacturers do not see how they would attract orders of higher values, and that this benefit will remain at the retailer level. A retailer may sell more products, coming from different manufacturers, but the number of items sold by a specific manufacturers will remain the same.

Time-to-order

When manufacturers were asked about whether long times-to-order were a concern for them, opinions were mixed though slightly skewed towards disagreement, as in Figure 3. This is interesting especially since, on the other end, retailers did identify this as a concern. In line with these results, only 19% agreed that FURNIT-SAVER may have an impact on lowering time-to-order.

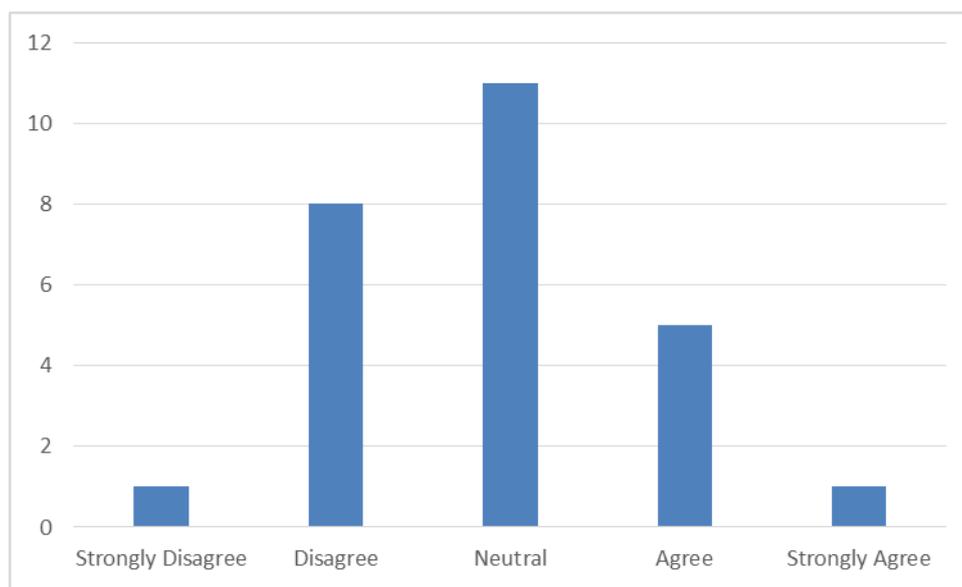


Figure 17: Is time-to-order a concern for your business?

However, when asked to estimate the percentage in which time-to-order may shorten thanks to FURNIT-SAVER, only 46% claimed there would be no change. Of those who did estimate a quantitative range for time savings, the majority (71%) foresaw a very small change: a reduction of less than 10% in time-to-order. This indicates again that manufacturers did not value FURNIT-SAVER's proposition with respect to making the sales process faster.

However, we believe there may be another explanation to this finding: when looking at the findings regarding usability reported in project Deliverable 4.2, a few criticisms regarding ease and speed of use are mentioned by manufacturers that may shed light on this finding; for example, manufacturers have said they would like to upload several products, or even entire catalogues, at once, rather than separately. We therefore suspect that the answers regarding time-to-order were somehow affected by these issues. In other words, manufacturers may have thought, based on their interaction with the prototype, that FURNIT-SAVER was laborious and slow in general and that clouded their ability to envisage that, in the long term, as the product reaches maturity, processes may in fact become faster.

Marketing costs

It is FURNIT-SAVER’s intention for its online catalogues and VR/AR environment to decrease the need for furniture manufacturers to pay for costly printed catalogues. Nonetheless, it seems that most manufacturers do not believe this would be FURNIT-SAVER’s impact; 82% of pilot participants were either neutral or disagreed that FURNIT-SAVER could save expenses on support material.

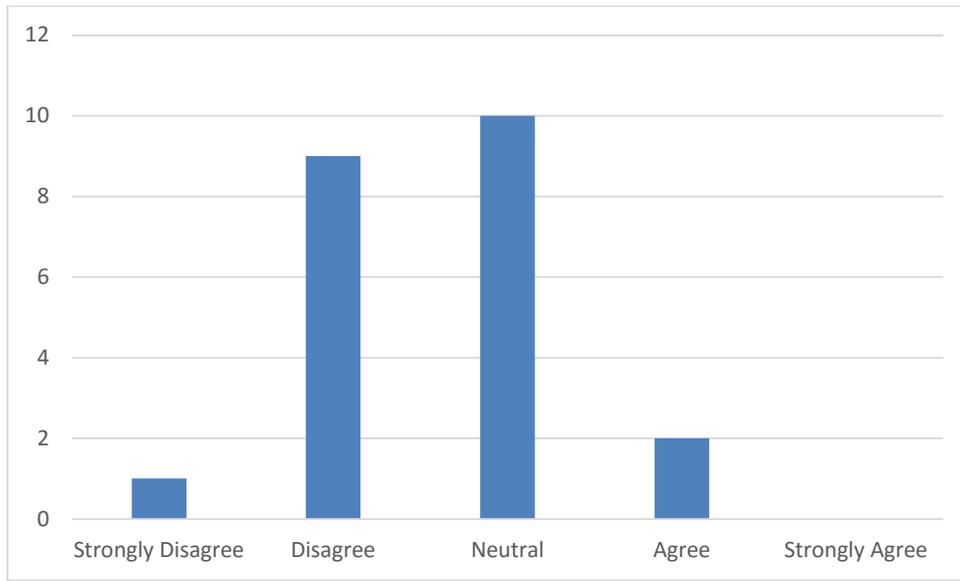


Figure 18: will FURNIT-SAVER reduce your spendings on support material?

Similarly to the issue of time-to-order, when participants were asked to quantify the impact on reducing spending on the production and shipping of support material, such as catalogues, 58% replied they expected no change. Of those who did choose a change range, 82% indicated a very small change of less than 10% in spending. Once again, as above, it seems that our expectations were not met and manufacturers did not agree with FURNIT-SAVER potential for lowering costs of support material.

In summary, the data from our validation activities indicates that manufacturers do not value FURNIT-SAVER features. This is a concern for FURNIT-SAVER’s future market acceptance; however, we believe that if retailers and consumers both recognise the benefits of FURNIT-SAVER and demand it is used, than manufacturers will eventually have to embrace it as followers. In addition, as we did not initially plan for this pilot to be included in the validation activities, it may be the case that we failed to provide an engaging testing scenario and attractive support material. While we are aware that, as discussed in D4.2, some usability problem exist especially on the manufacturers’ side, we still believe FURNIT-SAVER has the potential of generating economic benefits for this group. As our post-project development activities continue, we will have to repeat the validation activities with this user group in an attempt to confirm FURNIT-SAVER’s value for manufacturers.

8 Summary

The following table summarises in general lines the main impacts we have identified in the different business cases, as per the examined indicators²:

Business case #	User group	Client retention	Product returns	Order Value	Time-to-order	Support material
1	Online domestic buyers	↑ 11% user satisfaction ↑ 11% likelihood to return	↓ product returns	↑ 62% items sold ↑ +190€ per order		
2	In-store domestic buyers	↑ 15% user satisfaction ↑ 20% likelihood to return	↓ product returns	↑ 47% items sold ↑ +70€ per order		
3	Online professional buyers	↑ 12,5% user satisfaction ↑ 1,4% likelihood to return	(↓ product returns)	↑ items sold	↓ 11,5% time-to-order	
4	In-store professional buyers	↑ 12% user satisfaction ↑ 4,6% likelihood to return	(↓ product returns)	↑ items sold	(↓ 4,15% time-to-order)	
5	Manufacturers		x	x	(↓ time-to-order)	x

Table 1: Summary of impacts per business case

From this table it is evident that FURNIT-SAVER has a strong value proposition for **domestic and professional users** in terms of increasing user satisfaction. This, together with the detected increase in likelihood to return to the shop will have a major positive impact on **furniture retailers**. Furthermore, the feedback from domestic clients foresee a sharp decrease in product return and an increase in order value –these impacts are expected to benefit retailers and manufacturers alike. We were able to estimate an expected increase of 190€ and 70€ in order value in **online and onsite stores**, respectively.

While we have expected **professional users** to identify a greater potential for shortening time-to-order, our findings still suggest professionals can speed up the selling process thanks to FURNIT-SAVER.

Finally, the most concerning data comes from **manufacturers** for which we could not detect the impacts we were hoping for. As the collaboration and participation of manufacturers in the future market uptake of FURNIT-SAVER is crucial, it is therefore paramount that this business case is re-examined, or possibly repeated in a future the advanced versions of FURNIT-SAVER so that the benefits offered to manufacturers could be better understood.

² Marked in brackets are indicators with a relatively low impact

Limitations

The validation activities of the FURNIT-SAVER project used a non-commercial prototype of the system, which might have caused hesitation among participants. Despite using accessible animation videos to transmit a feeling of the final product, participants may have still struggled to envisage the product when it reaches market maturity. It is possible that much of the recorded data in fact represents a certain bias caused by limitations of the current prototype which we intend to improve/fix prior to any market launch. For this reason, any positive or negative impact detected in this report should be taken as tentative and pending confirmation via large scale demonstrations.

In terms of sample size and demographics, due to time and effort limitations we mainly used participants from Spain and Slovenia. Although the number of people involved was high (176 participants), we cannot confidently claim that the results are valid for the entire European market. Nonetheless, as the main representation of furniture manufacturers and retailers in the project came from Spain and Slovenia, and this is where the product is expected to be launched at least initially, we believe these results are relevant for our immediate business interests.

Future actions

In the future, we intend to implement the recommendations given during the validation activities by the different user groups (mentioned in deliverable 4.2) so that we cater better to their needs and preferences. A large scale demo will be carried out to re-assess the findings described in this report. An iteration of the business case for manufacturers is expected, in order to obtain a better clarification of the business benefits FURNIT-SAVER is offering this user group.

Albeit the aforementioned limitations, the findings summarised in the table above will be incorporated into our marketing strategy and we believe they will become a useful tool towards promoting market uptake.

Annex 1 Business indicators

8.1 Full list of indicators

Based on the indicators identified by the pilot partners in the business case benchmarking (included in D5.3), the following table names the relevant indicators per pilot:

Indicator	Unit
1. Conversion rate	%
2. Client satisfaction	Scale 1-10
3. Client retention	%
4. Product returns	%
5. User value	€
6. Order value	€
7. Items per purchase	N
8. Furniture/accessories order ratio	%
9. Time-to-order (client to vendor)	Hrs/Days
10. Time-to-order (Vendor to Manufacturer)	Hrs/Days
11. Time-to-shipment	Hrs/Days
12. Salesperson effort	Hrs, €
13. Cost of support materials (catalogue design, print, shipment)	€
14. Storage time retailer	Days
15. Storage time manufacturer	Days
16. Profit on order	€
17. Profit per manufacturer	€

Excluded indicators

Importantly, it was important in choose indicators we can measure.

We report that the following indicators are excluded from the analysis due to confidentiality issues. While they may be interesting to study, they pertain to data that our pilot sites request to maintain confidential:

- Profit on order (#16)
- Profit per manufacturer (#17)

Also, following discussions between WP4 and WP5, the following indicators were excluded from the analysis due to need to shorten the validation questionnaires. These are indicators that were considered to be of less interest and where FURNIT-SAYER is expected to have less impact:

- User value (#5)
- Time to shipment (#11)
- Storage time retailer (#14)
- Storage time manufacturer (#15)

8.2 Mapping indicators per scenario and user group

Next, for each of the user groups in each pilot we have shortlisted the most relevant and insightful indicators. This segmentation includes 5 user groups:

- 1) Manufacturers
- 2) Online shops
- 3) Onsite shops
- 4) Domestic users
- 5) Professional clients: under this group we consider both contract channels (hotels, office buildings, etc) and their internal or external designers, architects, etc.

The pilots took place on 6 different sites, each with a respective pilot manager appointed from the FURNIT-SAVER consortium. Each of the pilot managers, was given the option of choosing 3-5 indicators from the ones identified in the following table:

	Pilot 1 (online-domestic)	Pilot 2 (onsite-domestic)	Pilot 3 (online-prof)	Pilot 4 (onsite-prof)
Manufacturers		✓ 4, 6, 10 (11), 13	✓ 4, 6, 10 (11), 13	✓ 4, 6, 10 (11), 13
Online shop	✓ 1, 4, 6, 8			
Onsite shop		✓ 1, 2, 9, 10, 12, 13, 4, 6		✓ 1, 2, 9, 10, 12, 13, 4, 6
Domestic client		✓ 2, 3, 4, 7		
Professional client			✓ 2 (final client + pro.), 3, 4, 7, 12 (designer effort)	✓ 2 (final client + pro.), 3, 4, 7, 12 (designer effort)

As expected some indicators were common to all use cases, while may be relevant only for a single uses case.

ⁱ Online shoe fitting app reduces returns by 23%. By Graham Charlton. 16 May, 2012, Econsultancy:

<https://econsultancy.com/blog/9896-online-shoe-fitting-app-reduces-returns-by-23>

ⁱⁱ The Impact Of Recommendations And Remarketing On Internet Sales, by iGoDigital. Available from:

https://www.exacttarget.com/system/files_force/en-igodigital-recommendationsremarketing.pdf?download=1&download=1

ⁱⁱⁱ Consumer market study on the functioning of e-commerce and Internet marketing and selling techniques in the retail of goods. Executive Agency for Health and Consumers. Civic Consulting, Berlin-Germany (Subcontractors: TNS opinion – Euromonitor International), 2011.