CLIMBING LOVERS' NEW RETAIL SPACE

Focusing users' new buying experience

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Climbing Lovers' New Retail Space
Focusing on the user's new buying experience

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Picture credits: https://www.sicilyaction.com/de/about/

ABSTRACT

The public pays more and more attention to a healthy lifestyle, and the demand for climbing equipment is increasing. Due to the rapid development of the Internet, consumers consumption habits are gradually changing, otherwise they will face massive debt, and inefficient operations. So the retail of climbing equipments needs to transform to adapt to those changes.

The project aims to create a consumer-centric retail space around climbing equipments that integrates online and offline and focuses on user consumption experience.

The consumer-centric retail model puts the focus of physical stores on experiencing mountaineering products, weakens retail, and studies the current existing consumer-centric retail store models to find a suitable direction for the consumer-centric retail of climbing equipments; Through the analysis of consumer data and the survey of existing retail stores in the market, enriching the consumer experience in the retail space and incorporating elements of climbing; Exploring the application of some new technologies in climbing equipments retail.

The projrct provides a solution to innovative new retail store for climbing equipments led by user experienceand and a thinking direction for the conversion mode of offline physical stores about climbing equipments.

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0.0/ Introduction

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0.2 Objective

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0.1 Problem

Modern-day sports equipments retail is at an inflection point as retailers face massive debt, and inefficient operations, among other issues. Sports retailing is in crisis. This has been caused by high costs, low profitability, and losing sales to online shopping. These problems are felt by most businesses operating from physical stores in high streets, shopping malls or neighbourhoods. The low growth in consumer spending since 2015 has meant that the growth in online sales comes at the expense of the high street.

The continued and widespread growth of e-commerce will inevitably lead to the large-scale closure of many sports retail stores. Department stores are at particular risk, with the pandemic felling iconic names such as Neiman Marcus and JCPenney. Malls saw declining foot traffic even pre-pandemic, but stay-at-home orders further shifted shoppers to online shopping and spending cash on essential goods instead.

Despite this growth, more money is still spent in stores with one of the main reasons being that people prefer to shop for products in person.

So this does not mean that e-commerce will replace physical retail. Physical retail of sports equipments requires changes to adapt to changes in consumer habits.

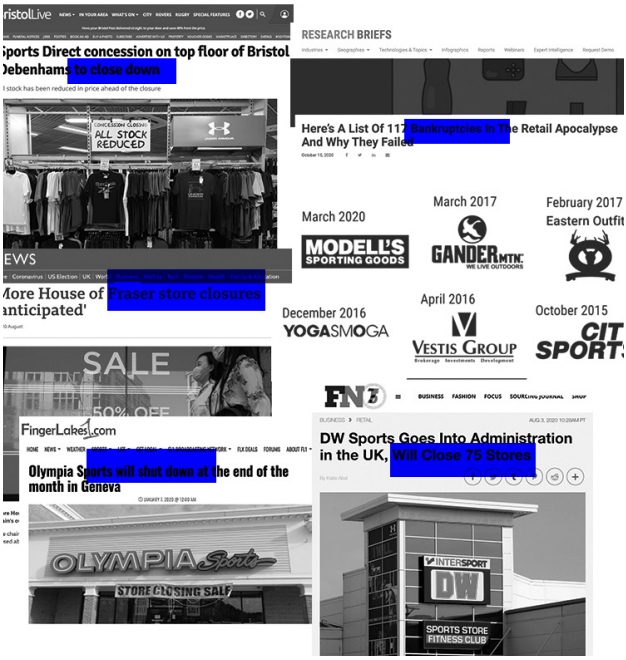


Figure1: News of sports retail store close down collection
"Sports Direct concession on top floor of Bristol Debenhams to close down" -BRISTOLLIVE
"A List Of 117 Bankruptcies In The Retail Apocalypse And Why They Failed" -CBINSIGHTS
"More House of Fraser store closures 'anticipated" -BBC
"Olympia Sports will shut down at the end of the month in Geneva" -FINGERLAKES
"DW Sports Goes Into Administration in the UK, Will Close 75 Stores." -FOOTWEARNEWS

0.2 Objective

The main objective of this thesis is to explore a climbing equipment retail stores that integrates online and offline and has rich shopping experience. The purpose is to adapt to changes in consumers' consumption habits, combine the advantages of online shopping, avoid the shortcomings of traditional offline shopping, and create a comfortable, convenient, and rich shopping experience.

The specific goals are: firstly, to combine space design with shopping experience to create a visually unified space with convenient shopping process; secondly, to combine modern new technologies into the space to create a rich and interesting space experience; finally, to give traditional retail space new life.

Online

Offline

Shopping
Experience

0.3 Methodology

The work is divided in four main parts.

1. Knowledge of Climbing
Have a comprehensive understanding of climbing. Starting from its historical development, clarify its types, as well as the development and upgrade of equipment.

2. Concept of "New Retail"
Starting from the importance of new retail development, research the concept of new retail and explore the technical support behind the realization of "new retail".

3. New Retail of Climbing Equipments
Investigate the application of "new retail" in sports retail industry, summarize the rules and innovate. Explain the main services provided in the project, the targeted consumer groups.

4. Projects
Propose solutions and transform the above theories into design projects.

1.

1.0/ Knowledge of Climbing

1.1 Origin and history of climbing

1.2 Classification of climbing sports

1.3 Introduction of climbing aids

1.4 Indoor climbing

Case Study 01: Augmented Climbing Wall

Case Study 02: Virtual Reality Rock Climbing

Case Study 03: Jukerock_Interactive Climbing Wall

1.1 Origin and history of climbing

Climbing includes mountaineering and rock climbing, they have been closely related since their respective origins at the dawn of the nineteenth century. Rock climbing , which in 1840 was given its first name , varappe' (Le Comte , 2008) , in the Saleve foothills of the French Alps, has often been thought of as a kind of preparation for mountaineering.

The earliest climbers are of course ancient humans. It is conceivable that they jumped at a critical time in order to avoid predators or enemies, thus achieving the sport of rock climbing.The earliest record of human climbing is that in 1492, King Charles III of France ordered Domp Julian de Beaupre and Captain of Montelimar to climb a limestone tower called Inaccessible with a height of 304 meters. At that time, they took simple hooks and ladders, and succeeded with experience and skills. The mountain was later named Mt. Aiguille, and that climb became the first recorded rock climbing event with equipment.

Until the middle of the seventeenth century, people's climbing activities began to be recorded again. The glacial terrain and snow-capped mountains became the challenges that these early climbers took the initiative to meet, and their footprints spread all over the Alps. In 1850, climbers had developed some simple climbing tools to help them navigate through rock walls and some glacial terrain. For example, shoes with claws and modified axes and wooden axes are the predecessors of crampons and ice axes.

The emergence of rock climbing technology has a history of more than 100 years. As early as 1865, the British mountaineer Ed Watt used simple equipment such as steel cones, iron chains and climbing ropes for the first time to successfully climb dangerous peaks, thus becoming the founder of rock climbing

technology and climbing tools. Later, people invented steel cones and steel wire hanging ladders for pumping air, as well as various climbing rope knots, which brought rock climbing technology to a more mature stage.

In the Alps, there are other people who try not to rely too much on tools, but use their own bodies to climb mountains. In 1878 Georg Winkler did not use any tools to successfully climb the west side of Vajolet Tower for the first time. Although Georg Winkler used hooks and improved shoes, he still pioneered free climbing.

Figure2: Mountaineering legend Edmund Hillary and his sherpa Tenzing Norgay were the first people to summit Mt. Everest, the world's tallest mountain, in 1953. Photo: Britannica

[1] Seifert, L. Wolf, P. Schweizer, A.(2017). The Science of Climbing and Mountaineering. 1-17. London: Routledge

1.2 Classification of climbing sports

1.Alpine style mountaineering and expedition style mountaineering.

Alpine mountaineers travel light and move fast. They tend to climb mountains at intermediate altitude (2,100m to 3,700m) and some high altitudes (3,700m to 5,500m). They carry their gear between camps and try to do a single push for a summit.

Expedition mountaineers take a slower pace. They may use porters, pack animals, fixed lines and tend to make multiple climbs to bring supplies up to camps. This style of mountaineering is mainly used in high to extreme altitudes where mountains like Mount Everest can take months to climb.

Alpine mountaineers

Expedition mountaineers

2.Free climbing

The term free solo means the most skilled and boldest person in the rock climbing group. This type of climbing method does not have all safety measures such as ropes and protective equipment. During the climbing process, only the climber faces the line alone.

Free climbing

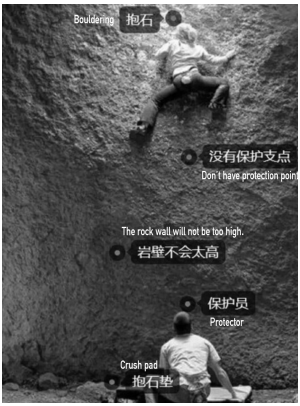
3.Equipment rock climbing

Equipment climbing refers to a climbing method in which climbers use rope ladders and various equipment to assist through difficult passages when they are unable to climb freely. According to the different equipment used, they are divided into two methods: Aid and Cleaning Aid, abbreviated as A and C. The biggest difference between the two methods is the use of the hammer. The potential meaning of the former being able to use the hammer is that climbers have the choice to gouge their eyes when they are poor; the latter is also called Hammerless Aid. The direct result of not using a hammer is that it will not be right. The rock wall causes permanent damage.

4.Bouldering

In the beginning bouldering meant climbing a large independent rock, but now it also includes a short rock face route. The height of bouldering is usually not high, so bouldering does not need a climbing rope for protection. Instead, a crush pad is laid on the ground to reduce the impact of falling. In the past, bouldering was just a training for climbers, but today bouldering has become a unique way of climbing. Compared with traditional climbing and sports climbing, the route is shorter, and the requirements for strength and explosive power are much higher than endurance.

Equipment rock climbing



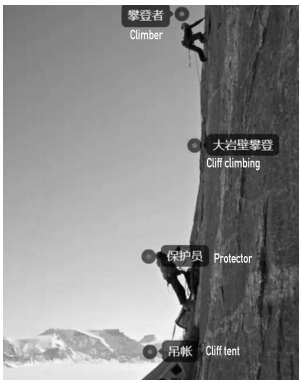
Bouldering

5.Cliff climbing

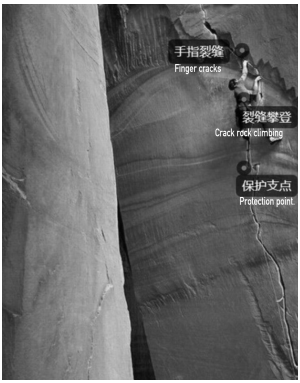
Cliff climbing is a high-level embodiment of climbing. Climbing on technical rocky terrain all day, sometimes even consecutive days. During the climbing process, climbers must face and deal with a variety of physical and psychological challenges, set up protection stations and choose camping sites, and finally complete the route and climb to the top of the rock.

6.Crack climbing

Cracks are cracks that open on the rock wall. Many rock climbing routes basically follow one crack upwards or connect several cracks. Intuitively, there are no so-called rock points for grasping in the cracks, but the body parts need to be inserted into the cracks, the body is stuck by rotation, friction and muscle resistance, and then the force is applied upward. According to the size of the cracks, the rock climbing industry generally divides cracks into hand cracks, fist cracks, finger cracks, and off-width cracks.



Cliff climbing



Crack climbing

7.Indoor rock climbing

The biggest advantage of indoor rock climbing is "risk predictability and difficulty controllability". The route and difficulty index of indoor rock climbing can be controlled artificially by changing the position of the rock point. If you are climbing rocks in the wild, you need to consider the weather, the risk of falling rocks, and the difficulty of the route in your area. Indoors, these are all controllable factors. You don't have to worry about sudden bad weather and the rock climbing gym has complete climbing equipment and safety guarantees. As long as you follow the regulations, your personal safety can be guaranteed.

Indoor rock climbing

Picture credits: The pictures in this chapter1.2 are from bibliography[2].

[2] Fan, L.Y.(2017).What exactly is rock climbing?. Stationery and sports goods and technology(01),20-23. doi:CNKI:SUN:WTYP0.2017-01-011.

[3] Musa, G. Higham, J. Thompson, A.(2015). Mountaineering Tourism. London: Routledge

1.3 Introduction of climbing aids

1.Main rope

The main rope is the joint line that runs through the climber, the protection point and the protector, and is an indispensable lifeline in climbing protection. The inside of the main rope is a multi-strand nylon rope entangled together, and the outside is covered with a sheath for fixing and anti-wear.

The main rope can be divided into power rope and static rope. Power rope is the main tool for various rock climbing activities. Static rope is generally used for descent and cave exploration. Only the main rope that has passed the UIAA or CE test and bears its certification mark can be used.

2.Protector

When the main rope passes through the protector in the correct way, its special structure can increase friction, so that the braking end of the main rope can control the greater weight of the stressed end with a small grip. The 8-shaped protector was the most commonly used before, but it caused the main rope to be twisted and twisted repeatedly. ATC solved this problem better. Protectors such as GRIGRI and REVERSO will lock themselves under certain conditions, but they must be used correctly.

3.Rock nails

Rock nails can provide another way to establish a protection point. One end is wedge-shaped, which provides protection by tapping the wedge into the rock joint, and the other end is ring-shaped, which can be connected with iron locks or slings.

Ropes

Protector

Rock nails

4.Harness

The harness is worn on the climber to carry the weight and momentum generated by the climber's falling. The waist belt of the seat belt is the stressed part, and the other leg belts are designed for comfort and convenience.

Before climbing, the climber and the protector should check each other whether the seat belt is worn correctly.The belts and leg belts are equipped with wide and thick foam pads. They are comfortable but bulky. They are suitable for indoor climbing and alignment process. However, lightweight safety belts are required for competitive climbing.

5.Quick-hanging

The two ends of the sling are respectively connected with an iron lock to become a quick-hanging.

When in use, one end is buckled into the protection point, and the other end is connected to the human safety belt or the main rope, which brings convenient operation. The iron locks at both ends of the quick-hook are not equipped with threaded buckles, and there is a danger of accidentally opening or being pressed open by force. Therefore, when there is only one quick-hook, it cannot be used as a fixed protection point.

6.Expansion nails

Using percussion drills and hammers, expansion nails can be driven into a whole piece of rock, and with the hanging piece, it becomes a very stable protection point.

Harness

Quick-hanging

Expansion nails

7.Iron lock

The iron lock is a metal ring that can be opened and closed freely, which connects various protective equipment together.

The threaded iron lock can lock the iron lock door in the closed state when the screw is fastened, avoiding the risk of accidentally opening. The ordinary iron lock does not have a threaded device, is light in weight and convenient to operate, and can be used for temporary protection points. If an ordinary lock is used for fixed protection, the principle of double iron lock and side-opening must be followed.

8.Sling

The sling is a soft ribbon, which is formed into closed loops of different lengths through mechanical stitching or manual knotting, providing a soft connection between protective devices. The strength of mechanical stitching is greater than that of manual knotting. With percussion drills and hammers, expansion nails can be driven into a whole piece of rock, and the hanging pieces become very stable protection points. However, the length of the sling can be adjusted freely by manual method to suit the needs.

9.Hanging piece

One side of the hanging piece is fixed on the rock wall by expansion nails or screws, and the other side can be buckled into an iron lock or quick-hanging, or connected with a flat belt, which is an important part of the protection point.

Iron lock

Sling

Hanging piece

10.Rock plugs

Rock plugs are metal products with different specifications and shapes. They can be placed in rock cracks, stone caves, stone bridges and other terrain and fixed to become a protection point. The rock plug without mechanical parts mainly uses its own anisotropic asymmetry and the shape change inside the rock joint to be fixed in the narrow part of the rock joint. The shape and size of the mechanical plug can be adjusted. It enters the rock gap in a contracted state, and can be stuck after being opened. It is convenient to operate and has a wide range of applications. It is a good choice for climbing traditional routes.

11.Crush pad

The protective means in bouldering, provide cushioning and shock absorption. Inside the bouldering mat are two or more layers of sponges with different textures. The top is the hard closed sponge, and the bottom is the thicker soft open sponge. The soft sponge sinks the shedder instead of dispersing the pressure, which is easy to dampen the wrist and ankle, so the bouldering pad should be placed with the hard sponge layer upward.

12.Helmet

The helmet can effectively prevent head injuries caused by falling rocks and abnormal detachment. The helmet must be worn properly to protect the forehead, back of the head and the side.

Rock plugs

Crush pad

Helmet

13.Chalk bag

Auxiliary equipment, magnesium powder can absorb sweat on hands and water on the surface of rock walls, increasing friction.

14.Rock climbing shoes

Rock climbing shoes are made of special rubber, which greatly increases the friction. From ordinary shoes to climbing shoes is an important change to improve the level of climbing. There are many types of rock climbing shoes, suitable for different rock quality, rock wall angles and different climbing methods.

Chalk bag

Rock climbing shoes

[4] Liu, M. Wu, YH. Pan, WW.(2020). Research on the Safety Guarantee Mechanism of Rock Climbing in Colleges and Universities. Stationery and sports goods and technology(05),245-246. doi:CNKI:SUN:WTYP.0.2020-05-120.

Picture credits: The pictures in this chapter1.3 are from the Internet.

1.4 Indoor climbing

The very first climbing gym in the United States was created in 1987. It was created in Seattle, in an old factory which was later renovated and opened as the first ever American climbing gym. The gym was named Vertical World.The gym is not just in existence but it is also operating in perfect condition. In the 1980's, Metolius started making plastic bolt-on climbing holds. The few gyms in existence then were able to change their routes and made newer climbing walls which were also lighter.

As the time progressed, technology came in with some goodies which helped to enhance indoor climbing tremendously. One of the major movers that brought in technology to the indoor climbing gyms was The TruBlu auto-belay. It allowed the people to ascend top-rope paths without the assistance of a partner. Interestingly, the Augmented Climbing Wall was released recently and this could change the way the gyms operated in so many ways. One of the things Augmented Climbing Wall promised to deliver to the gyms included a combination of projected graphics and proprietary body tracking which created interactive games and training applications. This combination allowed the creation of numerous routes on a smaller space and also gave feedback to assist you with your climbing technique.

These indoor climbing walls have really come a long way since the days of the little beginnings. It is known that they started as a training avenue for seasoned climbers to train themselves and to also serve as a place where people can exercise themselves and meet other people of like minds. Today, statistics show that people influx the indoor climbing gyms in their thousands on a daily basis. These visitors range from people at all levels of indoor climbing, ranging from professionals to newbies and it will be a thing of joy to see how the industry turns out to be in the nearest future. It will be nice to see how the gym adapts to the emerging technologies and ever increasing demands of fans and participants.

CASE STUDY 01: Augmented Climbing Wall

"A new and revolutionary way to practice, learn, and have fun!"

Augmented Climbing Wall combines projected graphics and proprietary body tracking to create interactive games and training applications. It supplied by Axtion Tech. The games and applications make the training fun, motivate kids to move and give feedback to help you become a better climber. Augmented reality climbing is suitable for any skill level and age. Interactive graphics and games maximize the capacity of any wall. Even small walls can have hundreds of distinct routes and games that create new fun challenges for climbers. The highly visual wall is some different types of games.

Hullaballoon: More importantly, it's about popping, swiping, tapping and squeezing as many balloons as you possibly can before the time runs out. Augmented Problems: Climbers can create their own routes suitable for their skill level and body type/ length by using the touch screen. Routes can be saved and shared to other climbers. Climball:An engaging two-player ballgame. Combining the best of pinball, air hockey and climbing, Climball is the coolest (and only) two-player ballgame you can play by climbing. Climball has two basic modes: competitive and collaborative. Sparks: It provides a new form of problem for indoor climbing. Climbers can use any holds they like as long as they don't touch the electricity. Beware, the electricity can move too. Shadowlings: It is Valo Motion's newest game for Augmented Climbing Wall. These fluffy creatures interact with your shadow. The game is about using your shadow to move the Shadowlings through different levels and finally bringing them home. Flash:It is great entertainment for every user group and brings operators not only closer to the Olympics but adds an exciting game for sports and competition oriented audiences. A level-creator will

appeal to groups and enhance the social experience, add an element of creativity and enhance repeatability. It is packed with stunning graphics and sounds that mesmerize both players and audiences in a unique setting.

Adventure Solutions offers an optional freestanding shroud frame system to support climbing wall. The wall panels and shroud system are laminated, not painted, providing a better look and more durable surface.

Figure3: Two kids play interactive games on augmented climbing wall

Figure4: Augmented climbing wall has freestanding shround frame system

Data sources: Augmented Climbing Wall
URL: https://www.climbingsolutions.com/course-styles/augmented-climbing-wall/
https://www.youtube.com/watch?v=AileeYYXwmw

CASE STUDY 02: Virtual Reality Rock Climbing

Uses Play Station and Oculus Rift to augment a real rock climbing experience with a fictitious environment.

This project was done by Dr.Jurgen P. Schulze and his two students David Nuernberger and Noah Martin. They used Oculus Rift and moutain device which allowed virtual reality around users. And they built small climbing wall that can actually climb up on. When users done this with Oculus Rift on their head, they can see a virtual world around and it looked like climbing on the outside.

For physical environment macthing up with reality envrionment, they added two critical elements Leap Motion and Sony Move. Basically, Leap Motion was to see the handholds which were more reflected on the wall. And they converted data which from Leap Motion to using on the virtual world around. Another was a tracking system which was made of Sony Move. It can track users head.

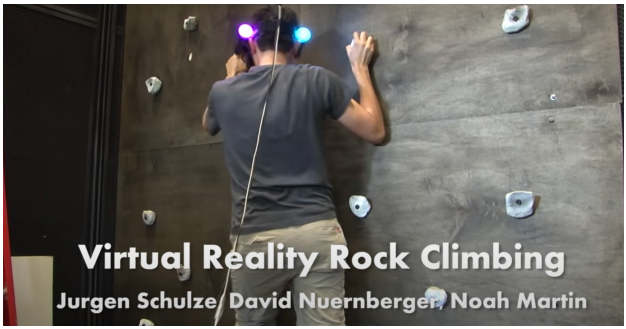


Figure5: The experimenter's real rock climbing scene

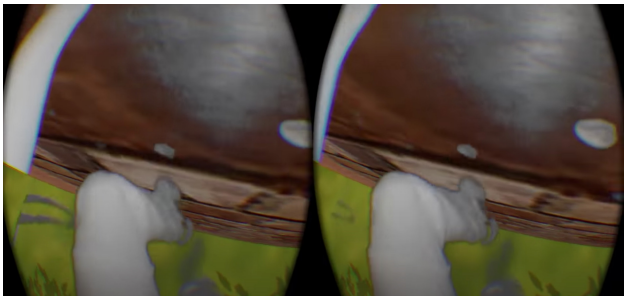


Figure6: The scene seen by the experimenter in vr devices

Data sources: Virtual Reality Rock Climbing URL: https://www.youtube.com/watch?v=cnGIz9kkd_E

2.

2.0/ Concept of "Consumer-centric Retail"

2.1 What is "consumer-centric retail"

2.2 Direction of "consumer-centric retail"

2.3 General "consumer-centric retail" case study

Case Study 01: Freshippo

Case Study 02: New Experience of Buying Car

Case Study 03: "More Mall"

2.1 What is “consumer-centric retail”

Consumer-centric retail uses new technologies, new models, and high-quality services to transform the production, circulation and sales of goods, and uses digital technology to integrate online and offline resources to better serve consumers and improve the service efficiency of the retail industry.

Online, in the “consumer-centric retail” ecosystem, it shoulders important functions such as information collection, sorting, feedback and decision-making for both merchants and consumers. It also assumes channel functions such as payment and communication. It is the main front of retail digital transformation. It plays an important role in optimizing the transaction process. At present, one of the main goals of many commercial enterprises implementing the "consumer-centric retail" strategy is to provide customers with a brand new shopping method that can get rid of the constraints of a specific time, space and form as much as possible, so as to achieve consistent prices, services and rights under different purchase channels and payment methods.

Offline is the basic platform supporting the "consumer-centric retail" ecosystem and plays an important role in optimizing the experience process. Most of the businesses' measures to improve the consumer shopping experience rely on it to promote implementation.In the future "consumer-centric retail" era, offline physical stores will be given more consumer experience functions. For users, offline is far more real and vivid than online. The mainstream retail model in the future represented by the "consumer-centric retail" will definitely place the factor of "people" at the core and key position, and the management of commodities is only the appearance. Through the upgrading and transformation of offline platforms, the traditional retail single and isolated flat sales method is embedded in the multi-dimensional and three-dimensional user consumption scenes, and a retail ecosystem with real life scenes as the experience entrance is constructed.

[5] Liu, JH.(2020).Research on the Countermeasures for the Innovation and Development of the Physical Retail Industry in the New Retail Era. Journal of Jiangsu Vocational and Technical College of Economics and Trade(01),29-31. doi:10.16335/j.cnki.issn1672-2604.2020.01.007.

2.2 Direction of “consumer-centric retail”

When physical stores are facing various problems and bankruptcy, it is particularly important to think about how to transform to adapt to the market, so "new retail" came into being. Through the report of "Centre for Retail Research Report, Retail At Bay" [Figure 7], it can be seen that besides high costs, low profitability, lack of preparation, the most important reason for the issues facing sports retailers with physical shops is the rapid growth of online competition. However, it is found that sports goods account for the largest proportion of online purchases, with 57.6% [Figure 8]. It can be seen that the biggest reason is because most of the consumption is generated online. In order to achieve transformation, the pros and cons of online shopping and offline shopping must be studied, and learning from each other has become the direction of physical store transformation.

Through data analysis on “Global Online Consumer Report, KPMG International, 2017”, we can conclude that the biggest reason why people choose online shopping is convenience, which includes ability to shop 24/7, save time, everything in once place. Ability to shop 24/7 is what consumers value most [Figure 9]. Conversely, consumers who choose to shop in stores rather than online think that being able to touch and try products is the biggest reason [Figure 10]. The "new" of "new retail" lies in avoiding the shortcomings of traditional retail and strengthening its advantages. Through the analysis of data, we can get the direction of retail innovation.

The rapid growth of online competition such that by 2018 online sales accounted for around 18.4% of total retail merchandise sales, with much of online growth achieved at the expense of bricks-and-mortar retailers.

The high costs of running retail outlets, including rents, business rates and high labour costs.

Low profitability caused by high costs, slow growth in sales, squeezed profit margins and heavy price competition.

Lack of preparation: low investment in stores and weak forward planning to meet the challenges of the new retailing.

Figure7: The reasons for the issues facing sports retailers with physical shops.
Data sources: Centre for Retail Research Report, Retail At Bay

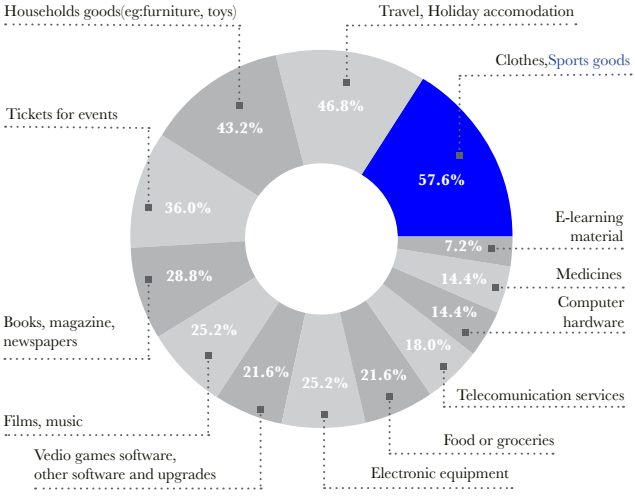


Figure8: Online purchases, EU-28, 2019
Data sources: Eurostat (online data code: isoc_ec_ibuy)

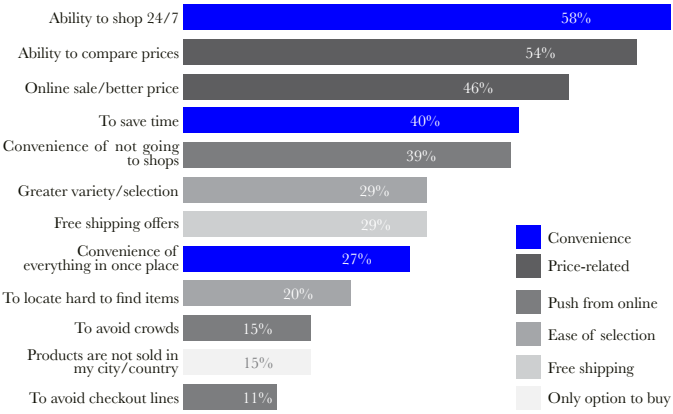


Figure9: Reasons consumers shop online instead of in stores.
Data sources: Global Online Consumer Report, KPMG International, 2017

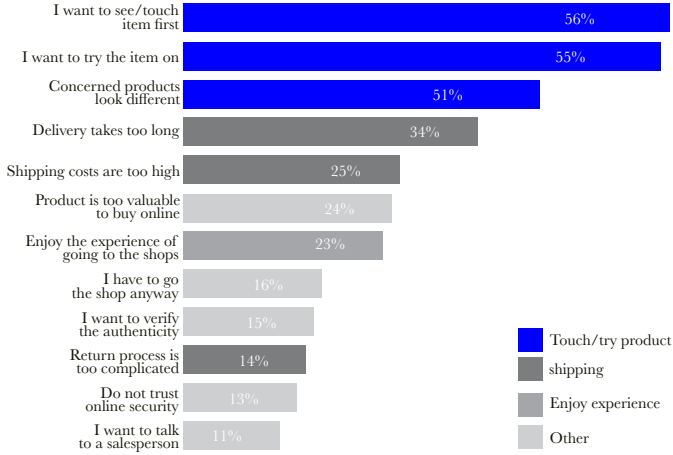


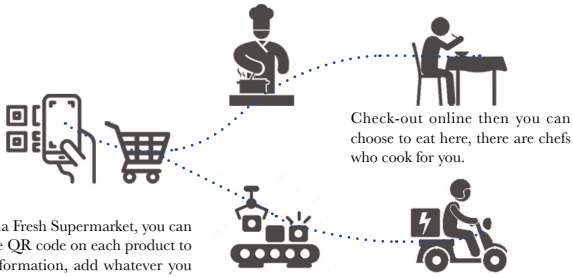
Figure10: Reasons consumers shop in stores instead of online.
Data sources: Global Online Consumer Report, KPMG International, 2017

2.3 General "consumer-centric retail" case study

CASE STUDY 01: Freshippo

Freshippo is a new retail format that Alibaba has completely restructured from offline supermarkets. Hema is a supermarket and a restaurant. The model Hema Fresh adopted is currently the best case of New Retail as it conforms exactly to the three steps in retail's evolutionary process: online and offline integration, experiential consumption and the industrial ecological chain.

"Retail + catering" (experiential consumption) is a megatrend and now government is also promoting integration of the certification of food circulation and catering services. Hema catering has two kinds of operational models: self-run and joint operations. As opposed to conventional "retail + catering", Hema catering also includes home delivery service which is supported by its self-made and crowdsourcing logistics systems. In contrast to the delivery service used by e-commerce, Hema catering has central kitchens and markets its own products. Its impact on the catering industry is considerable and can be viewed as a cross-border attack.



In Hema Fresh Supermarket, you can scan the QR code on each product to view information, add whatever you want to E-shopping cart.

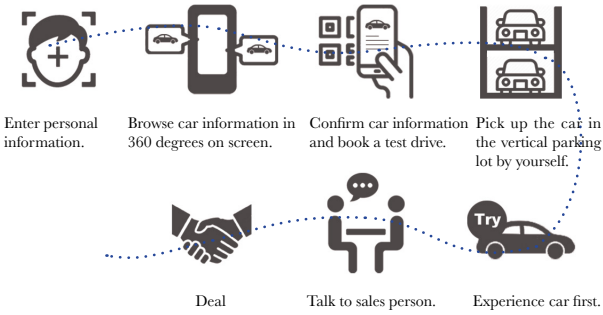
Check-out online then you can choose to eat here, there are chefs who cook for you.

Or deliver to your home, no more than 30 minutes arrived.

CASE STUDY 02: New Experience of Buying Car

Alibaba and Ford signed a deal to form a partnership, the companies have opened a cat-themed car vending machine in Guangzhou, China, that lets customers easily test-drive Ford vehicles they're looking to buy. The "Super Test-Drive Center" is an unstaffed, digital vending machine that works with the Tmall app. Users select the car model they're interested in, put down a deposit electronically, schedule a pickup time, and snap a selfie so the vending machine can recognize them when they pick up the car for a test drive. The test drives are free, as long as customers have a very respectable credit score of 700 or above.

When they get to the vending machine, customers verify their identity, and the car is then dispensed from the multistory structure. The process is quick, and Alibaba says it lasts no longer than 10 minutes. Customers can drive the car for three days, testing the car in different scenarios like a normal commute, a trip to the grocery store, and a road trip if they wish.



CASE STUDY 03: "More Mall"

Alibaba is building the first self-owned shopping mall—"More Mall". The first "More Mall" will build at the Alibaba's headquarter—Xixi Park in Hangzhou province. It will locate at the Taobao town and cover an area of 40,000 square meters with 5 floors.

"More Mall" will equipped with a series of Alibaba's new retail technologies. Tmall opened "new retail showroom", which displayed a series of new retail products driven by technologies including the Tianyanar, "future make-up mirror" and "virtual fitting room" at Kerry Centre and Yintai Center in Hangzhou Province. Tmall aims to normalize these technologies to create smoother O2O. Insiders said that many related technologies were already mature and "More Mall" would provide these technologies platform for large-scale commercial. What's more, some Tmall ideas will "land" at this mall.

Data sources: Alibaba's "New Retail" Explained
URL: https://www.youtube.com/watch?v=336YkwayCD4

Figure11: Freshippo key process collage

Figure12: New experience of buying car key process collage

Figure13: “More Mall” key process collage

3.

3.0/ Consumer-centric Retail of Climbing Equipments

3.1 Technology to support "consumer-centric retail"

3.1.1 Beacons

A beacon is a small wireless device that works based on Bluetooth Low Energy. It's kind of like a lighthouse: it repeatedly transmits a constant signal that other devices can see. Instead of emitting visible light, though, it broadcasts a radio signal that is made up of a combination of letters and numbers transmitted on short, regular intervals. A Bluetooth-equipped device like a smartphone, gateway, or access point can "see" a beacon once its in range, much like sailors looking for a lighthouse to know where they are.

In some cases, such as path finding, beacons can transmit the location data. The location data of the beacon is calculated based on three combined factors: its transmission power; its reference RSSI (the strength that the signal achieves at this set transmission power at the range of one meter from the beacon); the actual RSSI (the signal strength at the location where the signal was picked up by a receiver).

3.1.2 QR Code

Since 1994, Quick Response Codes have come a long way. In the smartphone era, these square-shaped barcodes have found extensive applications.Some of these include inventory management, marketing & advertising, security, mobile payments, education, and personal use.

Application in shopping, Each product has its own QR code, which contains all the information of the product. You can know the inventory, model number, etc. through the QR code. The most important thing is that you can add it to your virtual shopping cart to complete online purchases, so you can avoid queues and improve the shopping experience.

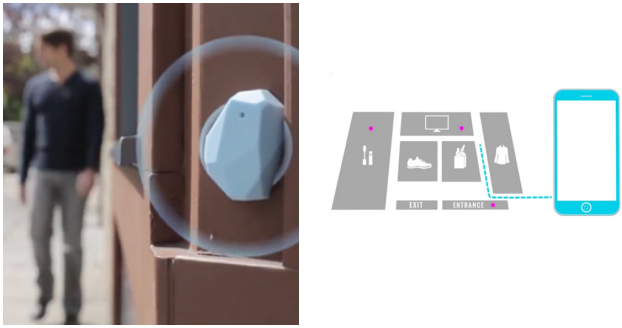


Figure14: Beacons can connect your phone's bluetooth.

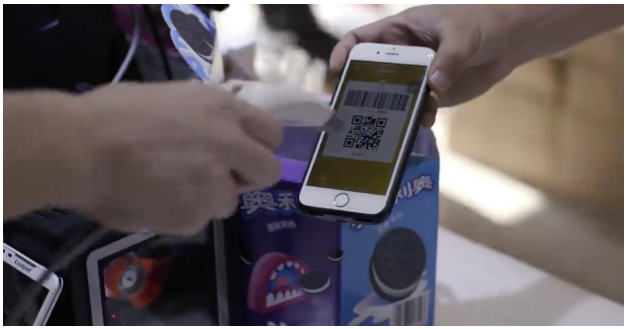


Figure15: QR code can contain any information you want

Data sources:
Beacon buyer's guide URL: https://goto.kontakt.io/beacon-buyers-guide
What is QR code? URL: https://baike.baidu.com/item/QR code/2385673?fr=aladdin

3.1.3 FXMirror

Seoul-based augmented reality brand FXGear unveiled its FXMirror concept which acts as a virtual fitting room platform that aims to take retail technology and experiences to new and exciting heights. Already trialed inside Korea's Lotte Department Store, the AR mirror works by calculating a person's exact height and measurements to showcase the most precise image of what clothing looks like when worn.

The FXMirror is capable of detecting the shape of the person and then overlap virtual clothing. The 3D cloth can be automatically and in real time, adjust to the size of the person. The virtual mirror fitting room has also the capability to collect customers' feedback so it is a cool option to hire it and to be used for events or as a permanent installation in a retail shop as part of the fitting or dressing room mirror. It can also allow users to share in social media their experience and at the same time, promoting your product. This is an engaging and innovative way of shopping that gives an unforgettable experience to the customer. Customers can chose color and type in virtual, when they make sure the suit they can take it and try. It could save more time.

Data sources: FXMirror URL: http://www.fxmirror.net/zh/main

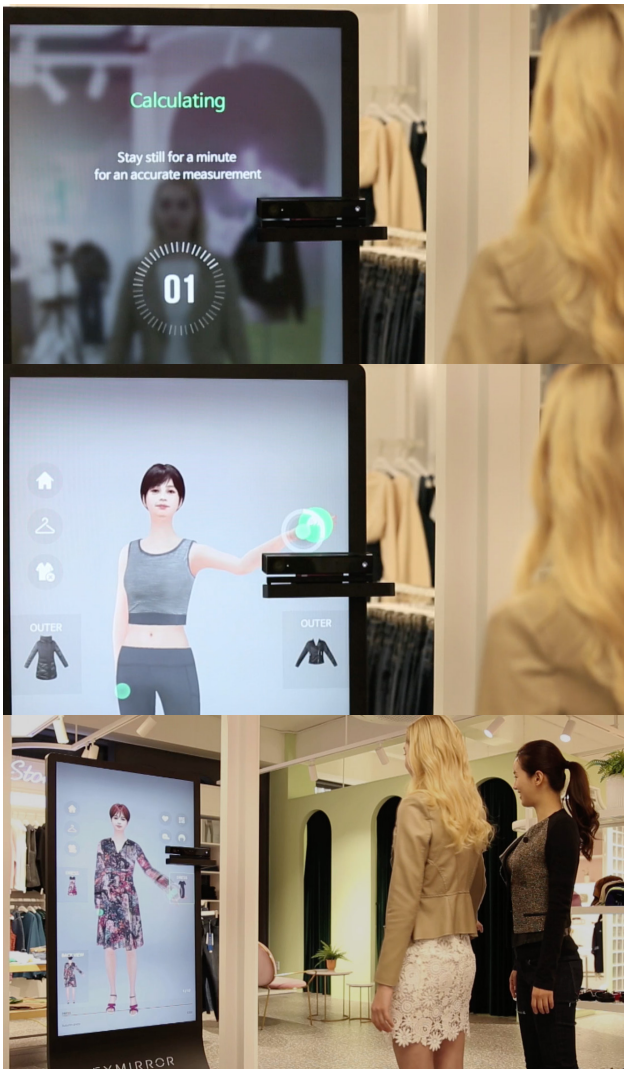


Figure16: Example of using FXMirror

3.2 “Consumer-centric retail” sports store case study

CASE STUDY 01: INNO-BOX

This is the innovative inno box, that redifined the format of new retail. A first prototype that tried to break the limited of space in Shanghai China. Those new device help the store increase sales over 190% up. And all the device connect to internet, help all the management more efficient.This device is just a beginning for explore the possibility of new retail.In INNO-BOX, you only need to touch the screen to make N pieces of TEE perform in turn in front of your eyes. The original forest, personalized graffiti, black and white ink, exotic embroidery, and subtle and interesting naked eye 3D animation tell you that each TEE is unique.

Designer: Itohn Tsao
Producer : Parker Pan

Figure17: Addidas inno-box in the store

Data sources: ADIDAS: Infinite window INNO-BOX, super common sense shopping experience
URL: https://www.digitaling.com/projects/27722.html

CASE STUDY 02: Mammut 3D simulation ski equipment

Beijing SKP Mall Mammut has installed a 3D simulation ski equipment using the latest technology. It simulates the skiing scene in the real environment, and has the same muscle strength feedback as in the ski resort. Through the virtual system, it realizes the real synchronization between virtual and reality, so that customers can experience the incredibly realistic skiing feeling.

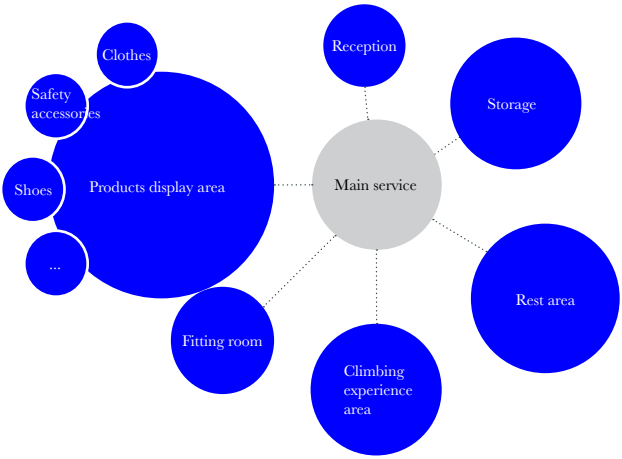
Figure18: 3D simulation ski equipment in Beijing SKP mall Mammut store

Data sources: MAMMUT Beijing SKP professional equipment takes you to experience 3D skiing
URL: https://www.8264.com/viewnews-113934-page-1.html

3.3 Main service framework

The main functions are divided into six parts.

Reception desk, which is responsible for answering customer questions, including the use of equipment and the shopping process.
Rest area, where customers wait and communicate.
Storage area, where can storage commodities and people can take items here.
Climbing experience area, which is used for guests to wear climbing items to test, or to stimulate potential mountaineering interests.
Products display area, which are displayed according to different types of people.
Fitting room, which is used for wearing of guest items.



3.4 Target population

Proficient in climbing
/ Clear purpose
/ New products

Tom is proficient in climbing,they need directly know where are the specific products , buy and check out. And he interests in new technology of climbing and new products.

Mountain enthusiasts
/ How to chose devices
/ More knowledge

Jack is mountain enthusiasts. He have not enough knowledge of climbing. For him, he need know how to chose devices and which devices is more suitable. Also he want to know more information about climbing like during different situation like rainy what should he do to rescue.

Children climbing enthusiasts
/ How to chose child devices
/ More child-protected knowledge

Francesca is a child climbing enthusiasts. He is 12 years old and already has two years climbing experience with his parents. He has willing to select his own equipments, and to learn about how to protect himself during activities.

Potential customers
/ Attract
/ Try

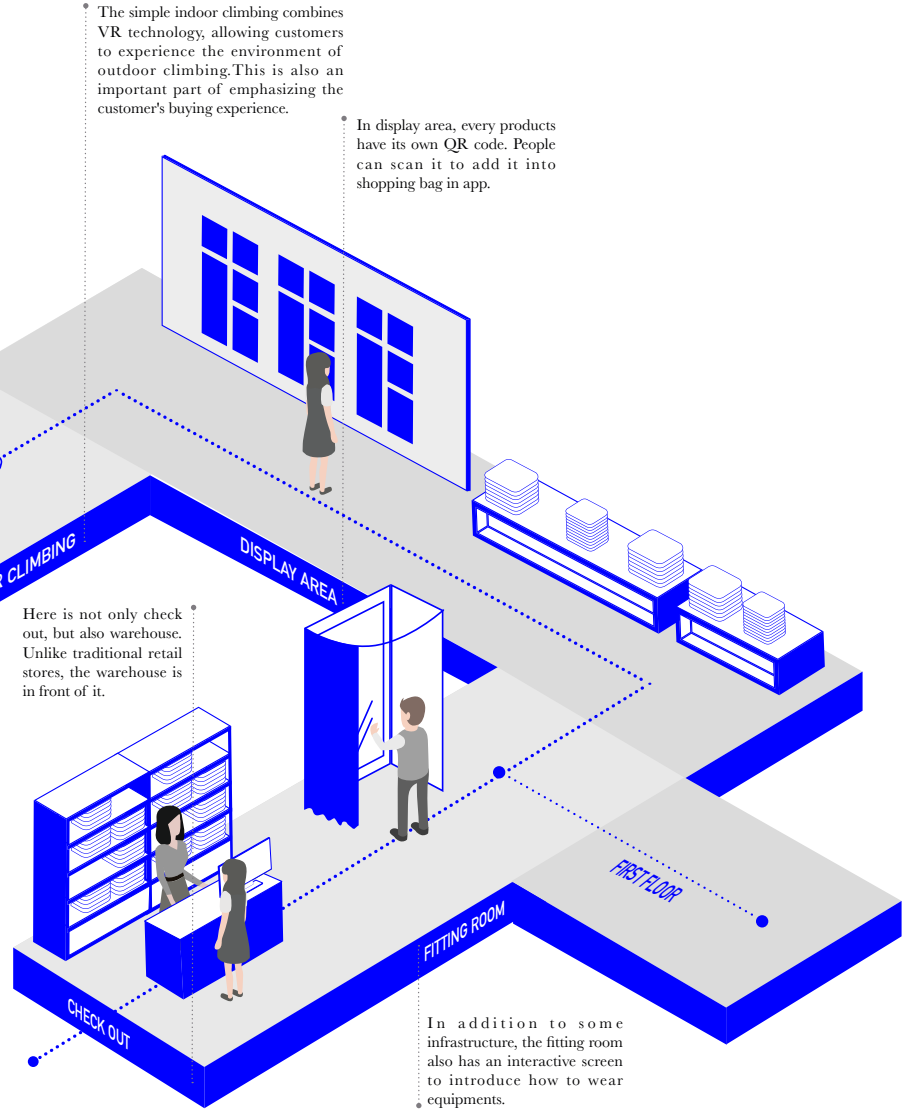
Sarah is potential customers. She would come with friends, but no climbing hobby before. She could be have some simple experience about introducing climbing and equipments.

3.5 User journey map

Place FXMirror and best seller at the entrance to attract customers. This mirror can simulate virtual wearing climbing equipments.

The reception area is mainly to answer customer questions, such as how to buy and how to use devices in space.

This diagram shows how the service we provide is combined with the setting in the space, showing the customer's entire activity flow in the space.



4.

4.0/ Design Studio Proposal

4.1 Location

4.1.1 Relationship with neighbourhood

4.1.2 Exisiting building

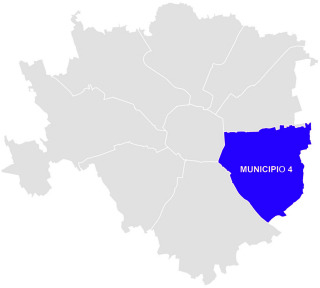
4.2 Layout of deisgn studio proposal

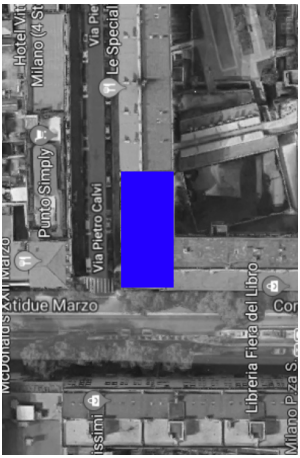
4.3 Highlight on climbing equipments retail

4.4 Connection with firsrt floor

4.1 Location

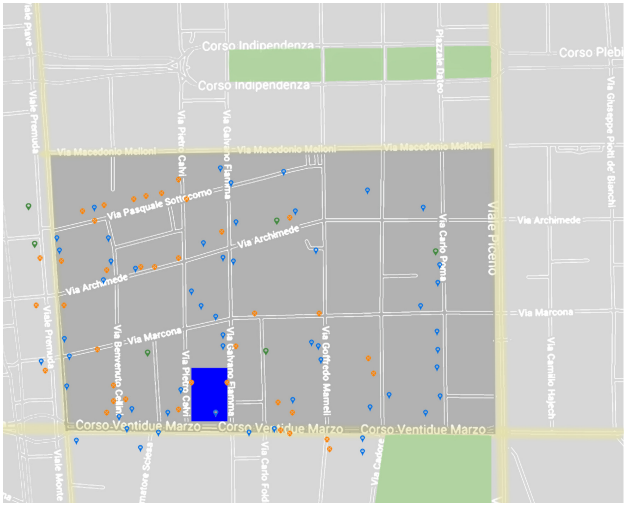
MUNICIPIO 4
Location: Via P. Calvi n. 31, Milan
Type of building: Store
Area: 162,04 square meter
Plan: Two floors
Describe: The site is located on the side of the street, which is close to Dateo station and two bus stations. The living facilities near the site are complete, including restaurants, supermarkets, banks, hotels and schools.





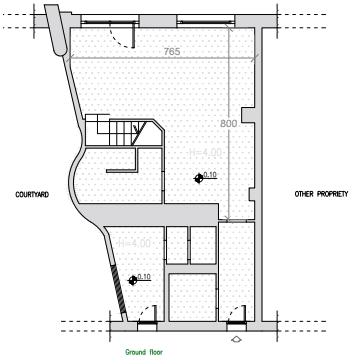
4.1.1 Relationship with neighbourhood

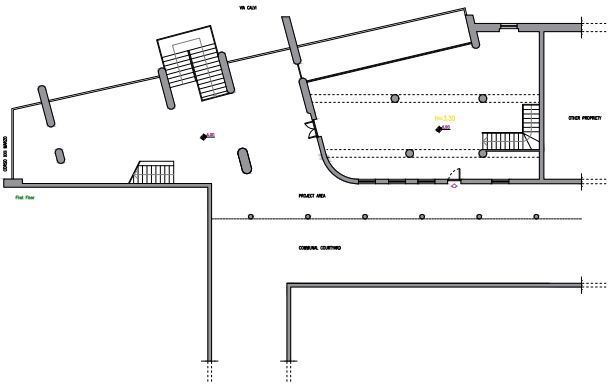
According to the survey, we found many infrastructures such as restaurants, shops, banks, station and schools. There are many local residents live here. The infrastructure is complete. It can meet the daily needs of residents.



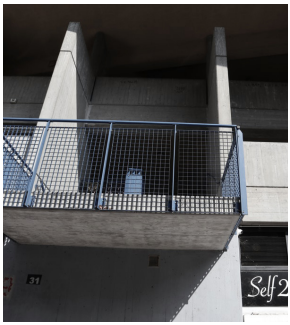
4.1.2 Exisiting building

The venue is divided into two floors. The ground floor area is about 91.8 square meters, and the floor height is 4 meters. There are two entrances, the main entrance can be entered from the street, and the secondary entrance needs to be entered from the community. Facilities such as bar racks are left in the venue.The indoor area on the second floor is approximately 160 square meters. It can be accessed from a staircase or an outdoor staircase. The infrastructure has toilets and storage rooms.



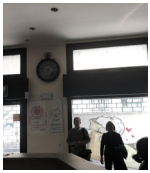


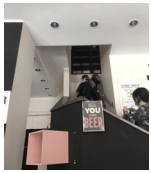
Community entrance



Second floor balcony

External access





Ground floor

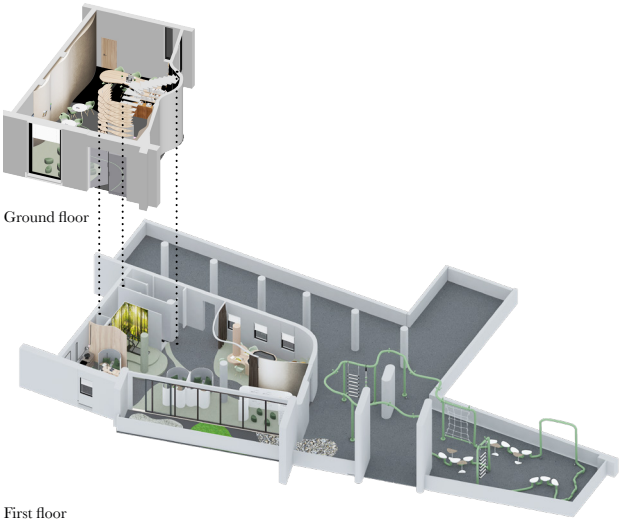
Second floor

Community

4.2 Layout of deisgn studio proposal

In the previous proposal, our group chose trekking travel as the theme. Space is dominated by a fresh and natural atmosphere. The ground floor is mainly for working which include reception service, consulting, display area and storage.

On the first floor, it is a space for testing body data, providing professional equipment, customizeing travel routes, and providing comprehensive personalized services. Outside space is for relaxing and entertainment.



Ground floor

First floor

Outside playground

Training area

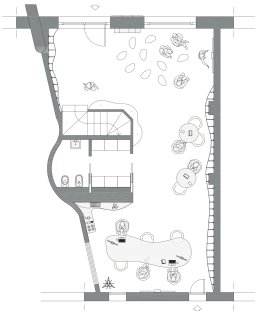
Catography area

Boots fitting area

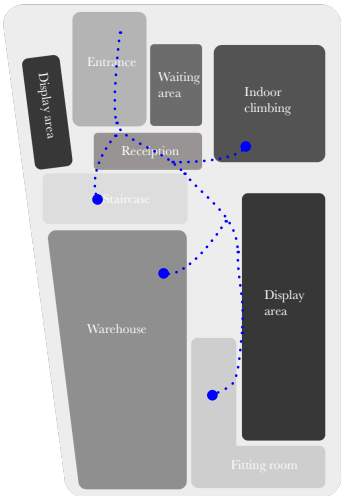
Outside playground

4.3 Highlight on climbing equipments retail

This project is mainly focused on the ground floor, transforming the office area and teaching area of the original space into a retail area for climbing lovers. Combined with the current new retail boom, the project design a retail area centered on the user's purchase experience, weaken the display inventory, and emphasize the display of commodity attributes. The online and offline business model must be a future trend, and the retail of climbing equipments is no exception. This project is an attempt to explore such a space.



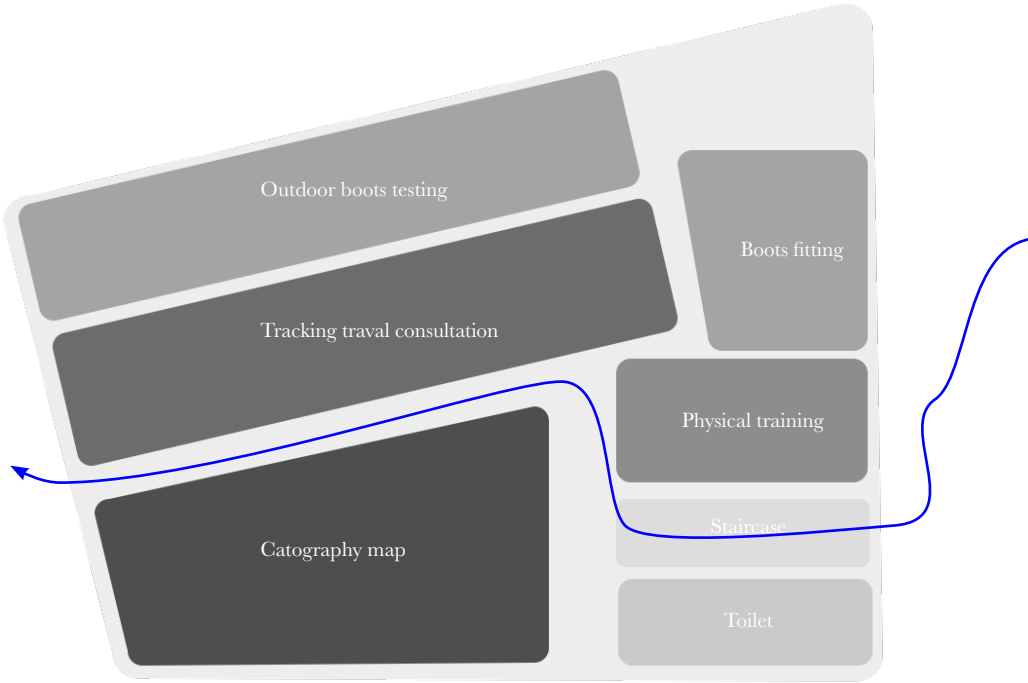
Original ground floor plan



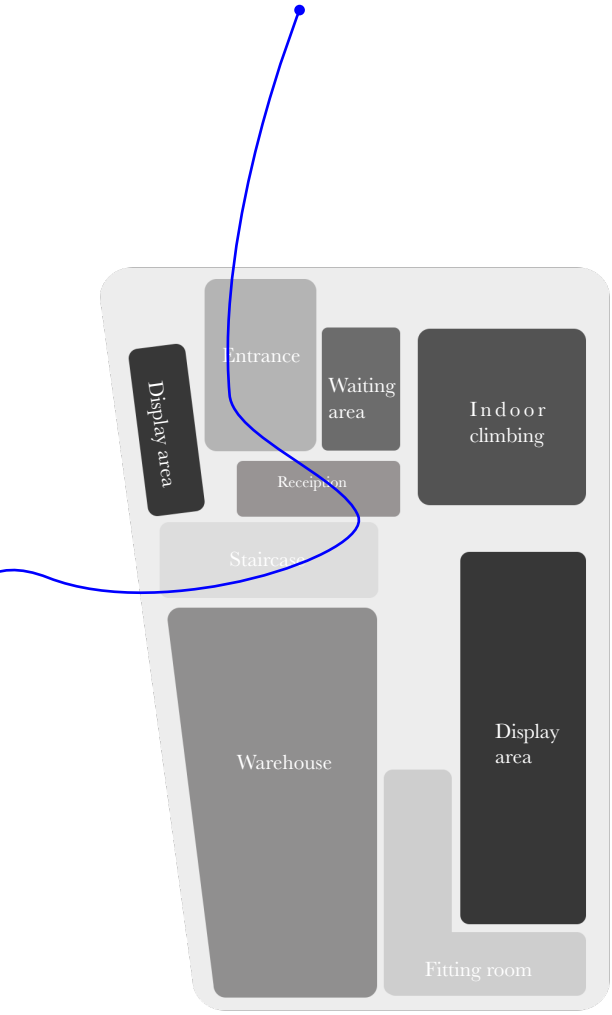
New proposal

4.4 Connection with firsrt floor

The functions of the first floor include these: the products provided on ground floor are for customers to try and buy. When a customer puts on equipments in retail store, he can go to the first floor to test and experience. This longer-term experience can fully consider whether the product is suitable for him.The projects on the first floor enrich the retail experience.



First floor



Ground floor

5.

5.0/ Project

5.1 Space concept

5.1.1 Concept design

The project chose "Undulate" as the conceptual starting point. The rolling mountains and rugged mountain roads always attract countless rock climbers and tracking traveler to find out. This project focuses on the continuous undulations of the mountains, choosing a square mesh structure as the basic unit, and arranging them in an orderly manner to form an overall system. The grid system is conducive to the display of goods.

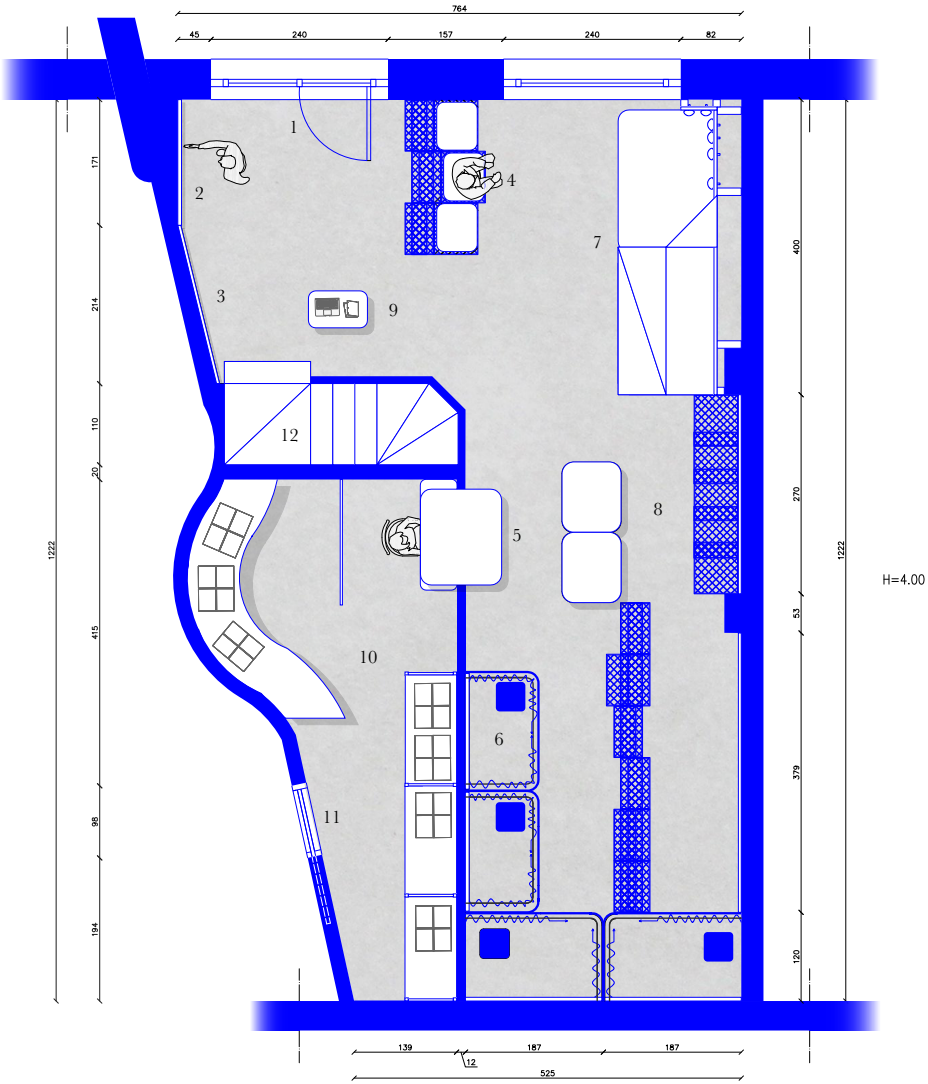
5.1.2 Space atmosphere

The choice of project space atmosphere is different from traditional sports retail stores, which mostly choose rough materials such as wood to create a sense of outdoorness. This project is to convey a concept of "new" retail. In addition to the difference in business model, the space atmosphere will also reflect the keyword "new". The following example is an OTH retail store in Montreal. The main materials of the space are concrete, blue acrylic, and white painted iron plates, which is more like a gallery. This is also the feeling this project wants to create. The main color is blue, white and gray, creating a simple and modern space.

Figure19: OTH store in Montreal designed by Daniel Finkelstein

5.2 Space introduction

5.2.1 Layout



1 Main entrance

2 Fxmirror

3 Best seller

4 Waiting area

5 Check out window

6 Fitting room

7 Indoor climbing

8 Display area

9 Receiption desk

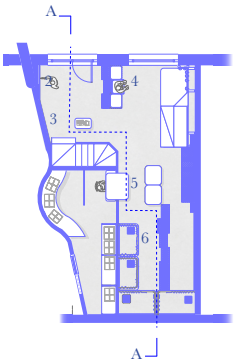
10 Warehouse

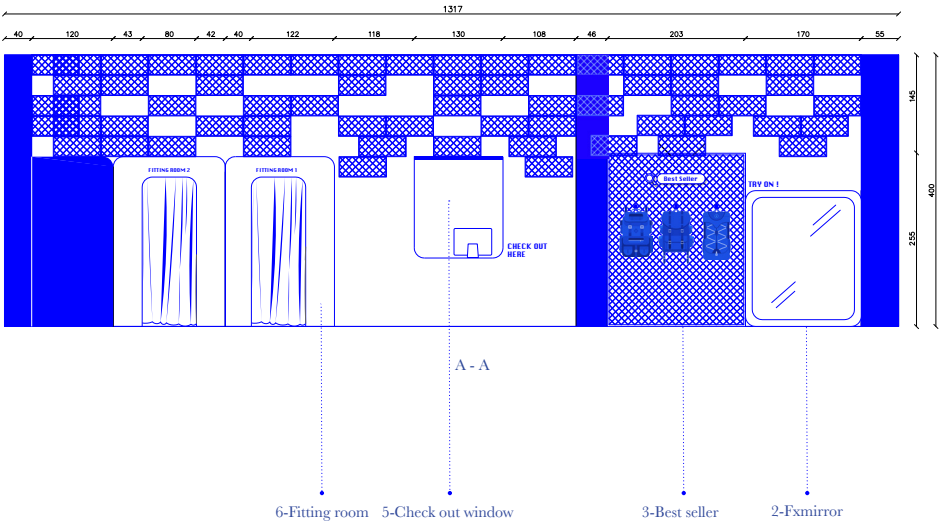
11 Entrance for stuff

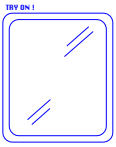
12 Stairs

5.2.2 Function area

This part introduces the details of space. Here we will start from the section, from each serial number to introduce each part of the space in detail, including function, form and so on. As the overall space is not large, mainly to show the use of wall space, so take the fold line section.



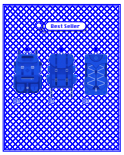




2-Fxmirror

H:200cm W:170cm

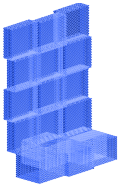
The FXMirror is capable of detecting the shape of the person and then overlap virtual clothing. The 3D cloth can be automatically and in real time, adjust to the size of the person.



3-Best seller

H:255cm W:203cm

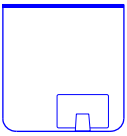
Use the grid to create a best seller display. The combination of the grid and various small accessories can be flexibly changed and adjusted according to the most popular products of the season.



4-Waiting area

CUBE L:60cm W:70cm H:50cm

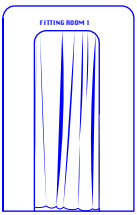
A three-seater waiting area is formed by superimposing grid squares. The grid extends up to the roof. On the back is a reminder board. When the guests come in, they can clearly understand what kind of things can be bought here and how to buy them.



5-Check out window

H:150cm W:130cm

This is the warehouse as well as the checkout window, and customers can raeceive their purchased goods after placing an online order. Select the mirror reflective material for the top surface to divide the space for the window area.



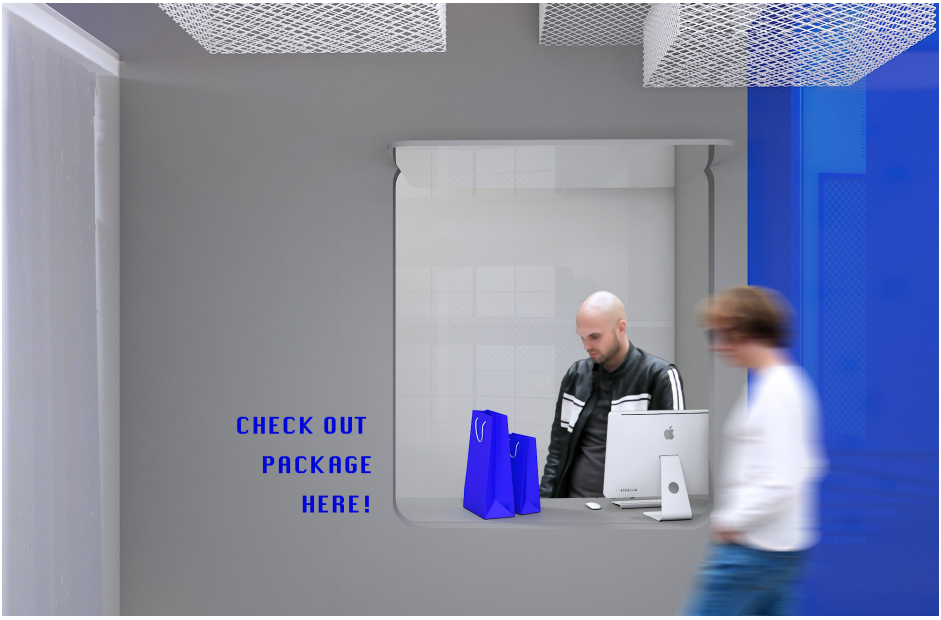
6-Fitting room

H:250cm W:160cm / 180cm

The fitting room chooses semi-permeable glass, combined with blue velvet curtains to ensure privacy. The fitting room contains a mirror, a small sofa and a touchable smart screen. Guests can learn about the knowledge of wearing climbing equipment through the screen.

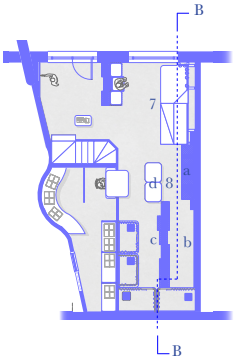
The entrance area seen from the wating area

Back of waiting area



Check out window

The fitting room seen through the grid display wall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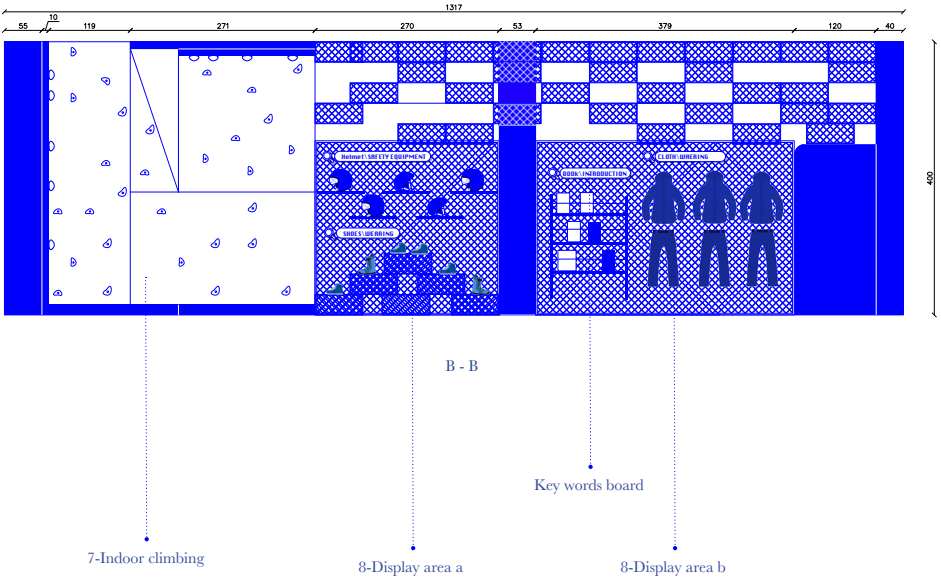
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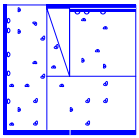
B - B
Key words board
7-Indoor climbing
8-Display area a
8-Display area b



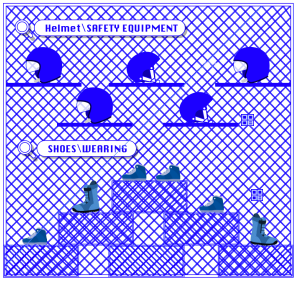
7-Indoor climbing

H:400cm W:400cm

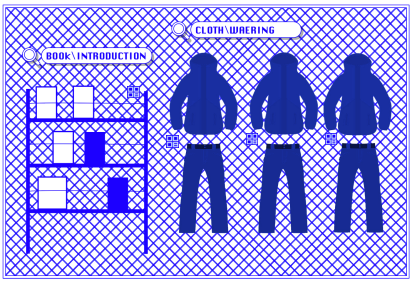
Combination of indoor climbing and VR. Customers can choose a well-worn device and experience it here. The combination with VR expands this limited space, allowing guests to see the outdoor scene.

8-Display area

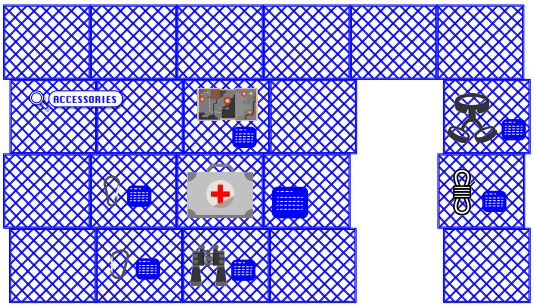
The display area mainly uses grids to construct a display system. In line with the principle of displaying the characteristics of the product, and considering that the overall space is not large, the product is mainly displayed in a tiled manner. The grid system can achieve this flexibly. Combined with the instruction board in the accessories area, the purpose and function of each accessories are stated in detail. Each section has a keyword board, and customers can search for keywords on the app to find similar products and add them to the shopping cart.



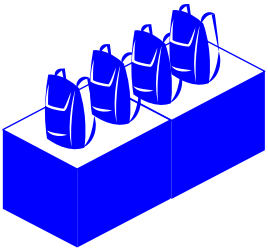
8-Display area a H:255cm W:270cm



8-Display area b H:250cm W:380cm



8-Display area c H:240cm W:420cm



8-Display area d H:70cm W:80cm L:95cm

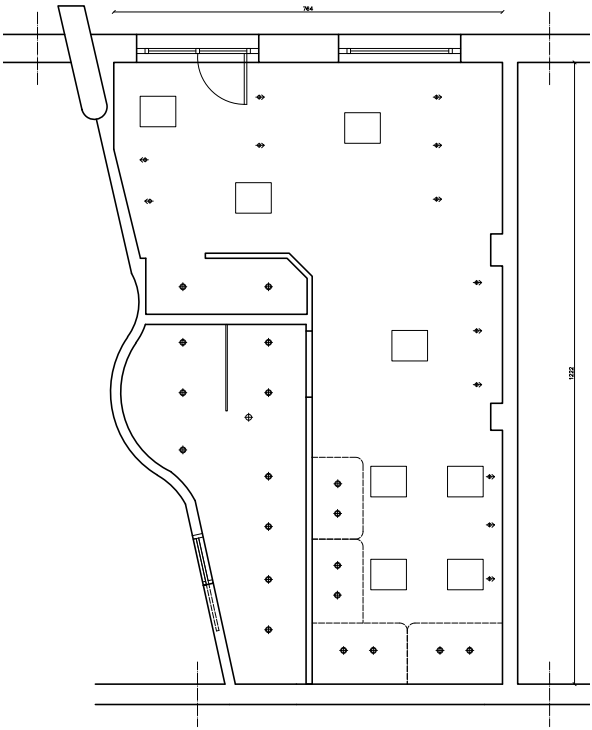
Key words board


SAFETY EQUIPMENT

5.2.3 Lighting system

Lighting is very important for the creation of the atmosphere of the entire space, so that the indoor space reflects the practical value and appreciation value to the greatest extent, and achieves the unity of the use function and the aesthetic function. The lighting of this project is mainly a combination of square ceiling lights and spotlights. The ceiling light uniformly illuminates the space. It is a surface light source. Its advantage is that the light is soft and does not form a strong beam. Square ceiling lights are perfectly combined with the grid system of the roof, keeping the same undulating rhythm with the high and low grids. Spotlights are used for centralized lighting in the display area on the wall to highlight. Light strips are used around the fitting room to create an atmosphere. Regarding the new retail model, the fitting room is the key area of this project. Customers make an appointment to try on the equipment in the fitting room, and the light strip plays an important role.In the warehouse area and inside fitting room, simple downlights can be used.

Rendering of lighting effect



Square ceiling light

Downlight

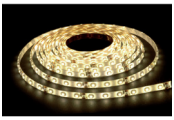
Spotlight

Light strip

Downlight LED
Thin Frame 6W 360Lm 30.000H 4200K

Yeelight YLXD10YL Smart Square LED Ceiling Light IP50 Dustproof
70cm*60cm 3400K

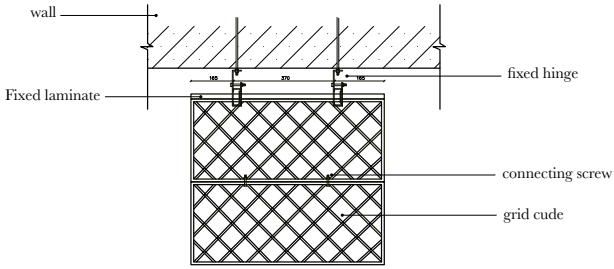
Mawa Seventies mounted spotlight LED switchable
H.ceiling mount 3.6 x H.18.6 x ø 9 x H.head 15 cm 3000K



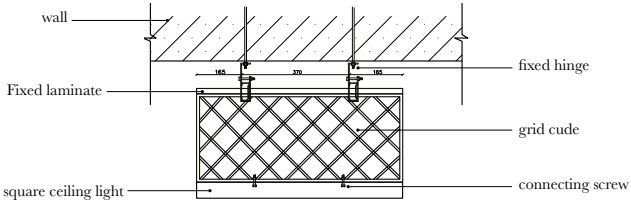
Remote Control LED Light Strip
Warm White

5.2.4 Roof grid system

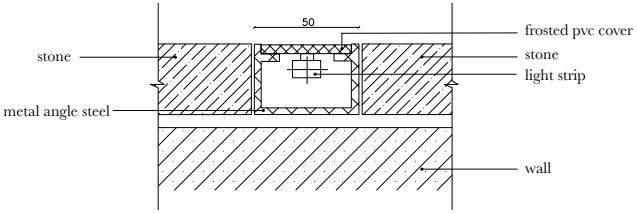
The roof grid system is an element that runs through the entire space. Since the height of the house is 4 meters, it is necessary to develop a roof system. It not only has a good influence on the atmosphere of the whole space, but also has a good integration with the lighting. Considering how to implement it, the following will briefly introduce its feasibility in conjunction with the construction node diagram.



Fixing details between grid cubes



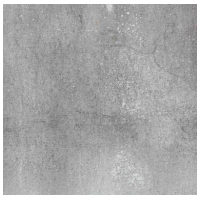
Fixing details of grid cube and ceiling, square ceiling light and grid cube

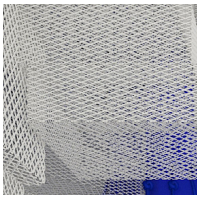


Installation details of the ground light strip around the fitting room

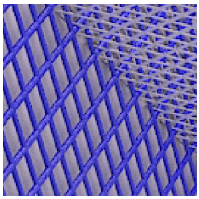
5.2.5 Material board

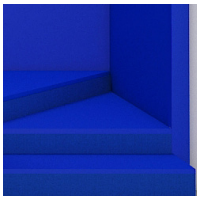
The space is mainly based on white, gray and blue. Simple and modern are preferred in the choice of materials. Mainly cement, blue acrylic, blue velvet, white or blue painted iron, frosted glass, etc.

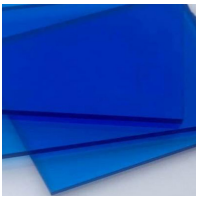

cement


signal white painted iron


telegrey 2 painted blockboard

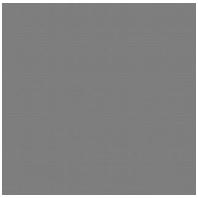

ultramarine blue painted iron


ultramarine blue painted cement

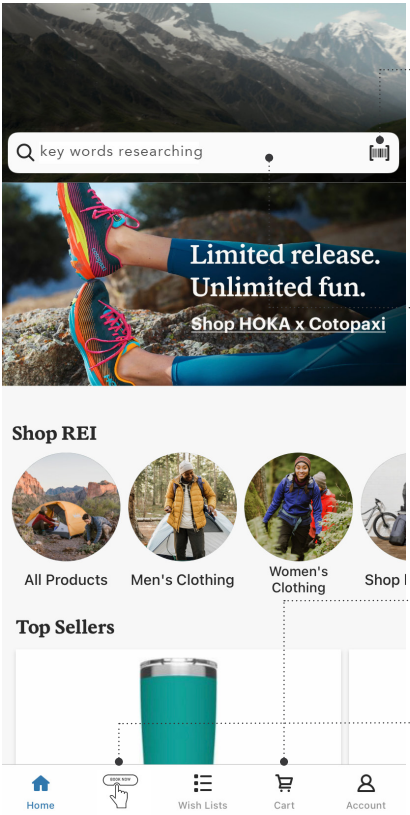

ultramarine blue acrylic


ultramarine blue velvet


frosted glass


telegray 1 latex paint

5.3 Connection with App



Each product in the space has a corresponding QR code, you can scan to view all categories and inventory.

The space display is mostly tiled, which simulates the visual browsing on the mobile phone. There are keywords next to the products, which can be searched in the app so that you can find all the related items.

App online checkout, and then to take away the goods.

Make an appointment for the fitting room and the products you want to try through the app, which is conducive to organization for stuff.

BIBLIOGRAPHY

[1] Seifert, L. Wolf, P. Schweizer, A.(2017). *The Science of Climbing and Mountaineering*. 1-17. London: Routledge

[2] Fan, L.Y.(2017).*What exactly is rock climbing?*Stationery and sports goods and technology(01),20-23doi:CNKI:SUN:WTYP.0.2017-01-011.

[3] Musa, G. Higham, J. Thompson, A.(2015). *Mountaineering Tourism*. London: Routledge

[4] Liu, M. Wu, YH. Pan, WW.(2020).*Research on the Safety Guarantee Mechanism of Rock Climbing in Colleges and Universities*. Stationery and sports goods and technology(05),245-246. doi:CNKI:SUN:WTYP.0.2020-05-120.

[5] Liu, JH.(2020).*Research on the Countermeasures for the Innovation and Development of the Physical Retail Industry in the New Retail Era.* Journal of Jiangsu Vocational and Technical College of Economics and Trade(01),29-31. doi:10.16335/j.cnki.issn1672-2604.2020.01.007.

[6] Lu W.(2009).*The sports goods retail market is in recession.* Modern Marketing (Business Edition) (09), 17. doi:CNKI:SUN:XIXJ.0.2009-09-011.

[7] Shan XZ.Meng J.(2019).*The strategic choice for the transformation of the physical retail industry under the new technology environment-a case study based on "Hema Xiansheng".* Contemporary Economy (09), 90-94. doi:CNKI: SUN:DAJJ.0.2019-09-024.

[8] Kajastila, R. Hämäläinen, P. (2014).*Augmented Climbing: Interacting With Projected Graphics on a Climbing Wall.* CHI 2014, One of a CHInd, Toronto, ON, Canada

[9] Hrušová D. Chaloupská P.(2019). *Experiencing In Climbing And Psychological Effects Of Sport Climbing.* The European Proceedings of Social & Behavioural Sciences EpSBS.ISSN: 2357-1330.

SITOGRAPHY

[1] Augmented Climbing Wall
URL: https://www.climbingsolutions.com/course-styles/augmented-climbing-wall/, https://www.youtube.com/watch?v=AileeYYXwmw

[2] Virtual Reality Rock Climbing
URL: https://www.youtube.com/watch?v=cnGIz9kkd_E

[3] Alibaba's "New Retail" Explained
URL: https://www.youtube.com/watch?v=336YkwayCD4

[4] Beacon buyer's guide
URL: https://goto.kontakt.io/beacon-buyers-guide

[5] What is QR code?
URL: https://baike.baidu.com/item/QR code/2385673?fr=aladdin

[6] FXMirror
URL: http://www.fxmirror.net/zh/main

[7] ADIDAS: Infinite window INNO-BOX, super common sense shopping experience
URL: https://www.digitaling.com/projects/27722.html

[8] MAMMUT Beijing SKP professional equipment takes you to experience 3D skiing
URL: https://www.8264.com/viewnews-113934-page-1.html

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