

# The Changing Room

## Multimedia Interactive Display System for Retail Stores

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**Abstract.** The Changing Room is a multimedia interactive display system. Digital media is used to make a projection on the walls, the ground and merchandise in the mall's display space, so customers can experience merchandise in the created context of digital images. Within the display space, the customers' various acts such as walking around, touching, and staying can trigger the sensors and then a variety of digital information will show up. For instance, directly projecting the relevant sales information around the merchandise, or producing a variety of different visual transition effects, to guide customers to participate in interaction and imagine the scenario or atmosphere by using this product.

**Keywords:** Interactive display system, shopping experience, projection.

## 1 Introduction

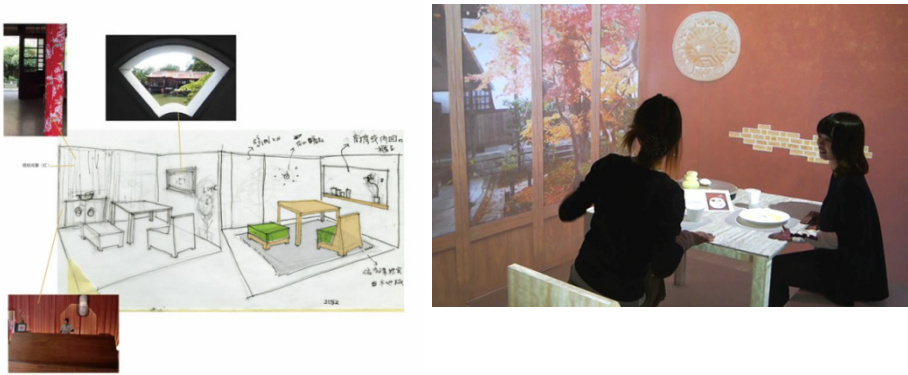
The majority of customers in retail stores, such as furniture and furnishings are often confused about what kinds of goods they should choose. This is mainly because they often cannot imagine the kind of scenario or atmosphere at home that will be created with those home supplies.

The Changing Room attracts customers by its visually interactive user interface. Through the display of a wide range of changing scenes and the instant availability of product details, customers can get sales information, and they can also immediately experience the related scenarios, further identifying their favorite goods and showing purchase intention. The digital content (including product information) can also be customized depending on the need of retailers in order to create miscellaneous experience spaces.

## 2 System Overview

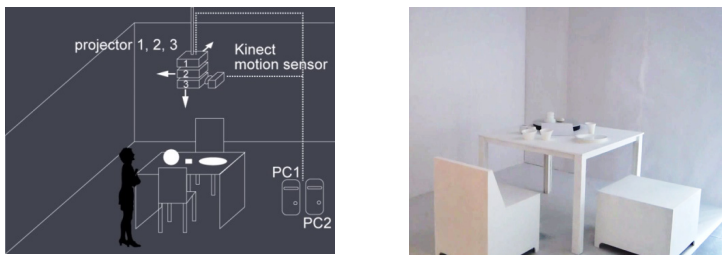
The Changing Room is designed for the annual exhibition at Osaka University of Art and aims to guide people to experience a variety of interior design scenarios based on different themes (see Figure 1). The project proposes a simulation solution by projecting the images to physical space. The appearance of the items in all sizes such as walls, tables, chairs and tableware is all presented through the projector. Visitors are

free to pick a projected scenario similar to their home or an interior design style they prefer, and specify the appearance and color of each item to more precisely determine whether the targeted products meet their requirements. The relevant design details are described as below.



**Fig. 1.** From left to right - the concept image of Japanese elements oriented digital content display, completed works

## 2.1 System Architecture



**Fig. 2.** From left to right - System Configuration, pure white colorless model

As Figure 2 shows, exhibition walls, tables and chairs and desktop objects are pure white colorless model before projection. The overall exhibition spatial configuration is 2.5 x 2.5 x 3 (L x W x H, unit: m); system devices contain three 5000 lumens (lm) of short-focus projector, two PCs, and one Microsoft Kinect motion sensor. The computer system's graphics card with multiple output functions allow three projectors to project images on the two walls, desktops and floors respectively. In addition, a Kinect motion sensor on the ceiling, by detecting the visitors' behaviors such as walking around, touching and staying, triggers the computer system to project a variety of interior design details and change the spatial scenarios.

## 2.2 Edge Blending and Motion Detection

As the exhibition space has three sides of the projection surface (walls on both sides and the desktop and the ground on the same side), the computer system needs to deal with the huge amount of image data, as well as motion detection functions. Therefore, during the virtual image projection, in order to reduce the workload of the display and detection operations, the two computers are connected for the synchronization of data processing to maximize the computer performance. The System will integrate configuration for the display of digital images, and then make edge blending after projecting them on the wall via different projectors. Further, the Kinect motion detector will constantly deliver the movements of the visitors back to the system and then give the visitors different projections of feedback content according to different interactions.

## 3 Future Work

This project has completed building the edge blending function and the visitors' "motion detection." In analysis of this project at the exhibition of the Osaka University of Arts in February 2013, with the experience of interaction with the visitors, this paper suggests that all goods information database should continue to be built and the function of customer image input provided.

### 3.1 Goods Information Database

The ultimate aim of The Changing Room is to provide retailers an exhibition and sales space in order to offer real-time commodity information and create the atmosphere of using products. Therefore, it is very crucial to build a database storing digital commodity information, which can be divided into three parts: the projected image, the narrative of goods, prices and stock quantity. For product images as shown in Figure 3, they must be designed based on the surface of the white projection model, so that customers can have feelings "on the spot." Commodity prices and inventory are also closely integrated with the system. For retailers with many stores, real-time inventory data management will bring great convenience for customers. In addition, the system must also provide product data maintenance interface to help retailers organize and input digital content that system can present in sequence.



Fig. 3. Product digital images projected on the white model

### 3.2 Customers Input Information by Themselves

Web2.0 represents the content is produced due to the participation of each user; by participating in the platform, there will be more diverse content [1]. On the second stage, the system development will focus on the function design, where customers input their own images. The input function can do real-time input through community website platform, or at the exhibition spot. Customers can input their own images at home, allowing The Changing Room to provide more experience. In other words, by replacing the system's built-in indoor scenes with customers' photos provided by them, the home display tends to be more personalized, allowing customers to experience more accurate atmosphere of trial commodities.

## 4 Conclusion

Our society has entered an era of emotion-oriented business, and "purchase of goods" is no longer the sole purpose of the consumption process. Customers often pursue more psychological satisfaction and responses. For instance, "Factory tour" in combination of tourism and manufacturing, attracts a large number of crowds and bring business opportunities, which is exactly the specific marketing model of the commercialization of "experience in person." Therefore, whenever the company puts service on the stage, uses commodities as props and let customers emerge into the setting, the so-called "experience" has been done. To put it in another way, when customers buy the experience, they are spending time on enjoying the feeling "on the spot" offered by the company [2].

Through the exhibition space created by digital images, retailers shape the shopping process as an experience process and use information technology to make "product experience" available. Therefore, The Changing Room rearranges details of consumption process and recreates the customer's shopping experience aiming to encourage them to explore the new implication on consumption, shaping an "experience economy."

## References

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2. Pine, B.J., Gilmore, J.H.: The experience economy: work is theatre & every business a stage. Harvard Business Press (1999)