AUGMENTED REALITY FOR FOOD MARKETERS AND CONSUMERS

Chapter 3
Augmented Reality in Retailing

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The essence of AR

Augmented reality is a technology in which computer-generated images (sometimes sound and textual info is also added) are imposed on reality.
AR does not replace the real world but coexists with it in a particular place and time, enriching it with, among other things, additional information or objects (Azuma, 1997).

In other words, augmented reality can be defined as a technology with the following characteristics (Wróbel, 2013):
• it combines the real world with virtual reality,
• it is interactive in real time,
• it allows freedom of movement in three dimensions.

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Requirements of AR

The technology of augmented reality requires four closely related elements:

- *the marker*, which enables the display of virtual objects; markers can be, for example, product logos, product packaging, bar codes, or arbitrarily chosen graphical symbols or signs ;
- *the hardware*, which enables an analysis of the real environment, and in particular for locating markers. Such devices include smartphones and tablets (i.e. devices with built-in cameras) or special eyeware;
- *the software*, often taking the form of applications installed on mobile devices, whose task is to first search for and identify markers, and then perform the programed actions (depending on the marker) to create the augmented reality;
- *the content*, which augments reality once the appropriate marker has been located. Reality can be augmented by static images, animations, videos, text, etc.

Basic types of AR technology

Generally two basic types of AR technology can be distinguished (Wróbel, 2013):

- *see-through*, in which virtual objects are placed (displayed) on a transparent screen through which the user watches the real environment. This is how devices such as goggles work. A person wearing them can without difficulty move around a specific area (e.g. a store), drive a car or pilot an aircraft, while at the same time observing reality enriched with the information that is necessary in a particular situation,
- *video-mixing*, in which the picture of reality from a camera is supplemented with computer-generated elements and the combined image is displayed on an opaque screen. In this way augmented reality can be generated on smartphones or tablets owing to the built-in cameras and appropriate applications installed. Also, virtual fitting rooms are based on a similar manner of generating AR (this will be discussed later in this chapter.

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The specificity of using augmented reality in retailing

- Significant opportunities can be offered by applying the AR technology to the retail sector.
- The use of this technology is intended to make shopping easier and, above all, to turn it into a form of entertainment.
- Augmented reality has the potential to increase sales by means of, for example, informing customers about special price offers on the products which they most frequently buy, or offering complementary products.
- Moreover, a feature that is particularly emphasized is that AR provides customers with an opportunity to see how a product works before they purchase it.

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The type, form and amount of information within augmented reality

An important issue connected with the use of AR is determining the type, form and amount of information which will be transmitted to the customer within augmented reality.

Therefore, the scope of information reaching the customer should be clearly defined, limited and, most importantly, adjusted to the individual client in three aspects (Zhu *et al.*, 2006):

- the customer's previous shopping history,
- product context (complementary products associated with the focal product),
- the customer's location in the store.

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The customer's previous shopping history

- Adjusting the scope of the provided information to the customer's purchase history, first of all requires collecting data on the purchases made by them.
- The data collected should relate to such issues as the type and amount of products bought; the amount of money spent; the frequency of shopping; etc.
- This data can then be combined with the demographic characteristics of the customer, such as their gender or age.
- Constructing a customer's profile based on their purchase history makes it possible to use augmented reality to provide the customer with adequate information about those products which they are most likely to buy every time they visit the store.

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Product context

One drawback of providing information about the products that a customer usually buys is that these purchases tend to be restricted to a certain permanent list of items.
This state of affairs can be altered by providing the consumer with information on products which are complementary to those which they customarily purchase.
Complementary products can be selected based on the following criteria (Zhu *et al.*, 2006):
• functionality
• aesthetics
• sociocultural factors

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The customer's location in the store

- The location of the shopper in the store can be a reference point for determining the products about which the customer should be informed.
- The location should be a kind of filter which prevents the delivery of information about all the products that are of potential interest to the customer.
- The selection of appropriate information depending on the location of the buyer in the shop can be possible only if highly accurate systems for determining the position of objects in three-dimensional space are used.

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AR as a tool for personalization

- The ability to determine the scope and type of information delivered to the customer makes augmented reality technology a tool for personalizing the buying process inside the store.
- This is possible even in the case of mass-purchased products such as groceries and goods used every day.
- New technologies have also resulted in changing the role of the customer in the personalization process.
- Personalization can be achieved without any active or, above all, conscious participation of the customer.
- All that is necessary is that a consumer uses loyalty cards as well as the smartphone applications which make augmented reality possible. Any such activity will supply data which can be used to create (automatically) an accurate customer profile

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AR in retailing - examples

- As regards, for example retailers offering food products, augmented reality can be used in several areas: offering help in searching for specific products, providing additional information about products for a customer.

- In both cases, augmented reality will be revealed by looking at the surroundings (e.g. the coffee aisle in a grocery store) through a smartphone, and more specifically through the camera built into the smartphone.

- Appropriately placed markers will then indicate, for example, the products of a specific manufacturer, those free of certain substances (e.g. gluten), coming from local suppliers or from a specific country.

- The markers placed on the packaging of specific food items can in augmented reality take the form of a detailed description of the product's composition, a set of recommended complementary products, or a recipe in which a given product is a key ingredient.

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AR in retailing - examples

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AR application can be used not only by customers but also by store employees. In this case they can get an easy and constant access to the information on stock availability or the expire date of offered products, for example.

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AR in retailing - examples

AR in retailing – final remarks

- Being a new technology, augmented reality is in the early stages of use in retailing.

- Therefore, at present it is difficult to judge whether it will become commonly accepted and used by customers or how profitable it will turn out to be for retailers.