

# Artificial Smell

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**Abstract:** *Human memory is closely concern with a perfume. A perfume is a liquid mixture used to emit a pleasant odour. It is formed from fragrant of oil that is essentials derived from plants and spices or synthetic aromatic compounds. Some common examples of unforgettable smell are smell of curry made by mother or the specific perfume used by favorite teacher. With some well-known advantages like mood enhancement, boost confidence, aphrodisiac, triggers memory, aroma-therapy and cures headache. A person's fragrance is good indication of his/her personality. Perfume makes us feel good or bad. The very first use of perfumes goes back thousands of years. The Egyptians used plants gum and resins in religious rites. As the years went by, scented substances were used to enhance body attractiveness and make home and public places more pleasant. Application areas of usage of perfumery are education, biotech, medical, cosmetics, housekeeping and many more. We can store, send and receive the perfume digitally by using digital scent synthesizer like devices. This might become interesting for keeping scent in memory, not only human memory but artificial memory also. The perfumes are getting recognized now a day on digital medium and becoming new channel in multimedia. In psychological study it is stated that our emotions are affected by perfume. Up to this moment we are digitally challenged only by sense of sight, touch and sound, now this technology makes us focus on sense of taste and smell.*

**Keywords:** Aphrodisiac, Digital Scent, Olfactometer, Digital Scent Synthesizer

## I. INTRODUCTION

Technology is changing rapidly day by day. Today's trend may not meet tomorrow. In such situations we must move on with the sense that we experience digitally. We only consider the digital sense like touch, vision and audio. Hence, there is new technology called Digital scent technology or artificial smell which makes us smell the things digitally. This may happened by using hardware and software.

Digital smell is one of the concepts of virtual reality. The virtual reality has provided very good features to the computer system. This amazing technology provides huge area of applications in communication which includes websites with scent, in scent-entertainment, games, movies and music [1]. Digi Scents an intuitive media organization, is making digital smell devices, new programming which will empower aromas to be communicated from the Web .

## II. EVALUATION OF ARTIFICIAL SMELL

Virtual Reality is considered as important technology, giving scope for a great leap for adverse fields. This Virtual Reality becomes sizzling topic for researcher since 6 to 7 years. Considering the examples of virtual reality in the form of 3D-goggles, hand-gloves, play stations and many more. By using this artificial smell motion pictures may followed by respective smell. The basic concept behind this to create more opportunities for various industries like advertisement, cosmetics, scent, medical, education and many more.

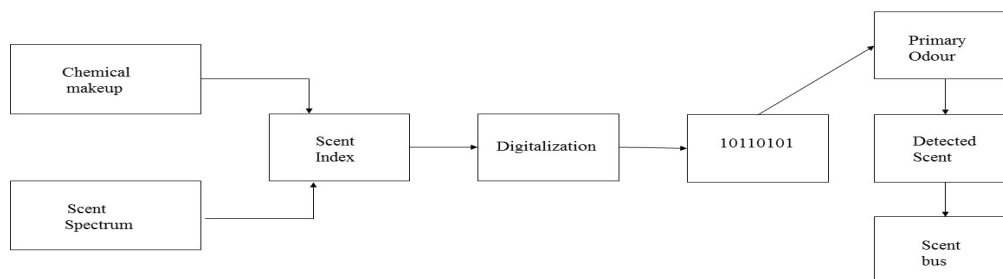
## III. LITERATURE REVIEW

Digital scent technology or artificial smell was firstly known as Analog scent technology. It was introduced in year 1929 when New York City Theater spread perfume in the movie ' Broadway Melody'. In year 1940 two movies namely 'Sea Halk' and 'Boom town' contains the concept of this artificial smell. But unfortunately these movies faced failure

because of asynchronous behavior of video and smell spread during the movie. In late 1950's Hans Laube invented the Smell-O-Vision, a system which released odor during the projection of a film so that the viewer could "smell" the scene in the movie. The Smell-O-Vision faced competition with AromaRama, a similar system invented by Charles Weiss that emitted scents through the air-conditioning system of a theater. *Variety* dubbed the competition "the battle of the smelliest. Mike Todd with his son Jr. Mike Todd again implement digital scent technology in their movie 'Around the world in 80 days'. Approximate in the mid of 1980's John Water come up with the idea of 'Odourama' with a scratch card. Hence this didn't work according to how it was expected. Digi Scents Inc. introduced a Synthesizer called 'iSmell' (122 different scents) in 1999. Due to some financial crisis, Digi Scents was shut down in 2001[3]. In 2003 Trisens develop a scent generating device called 'scentdome' (60 different scents). In 2004 Soo-ji wellness and France Telecom developed a scent generating device called 'Kaori web'. Later in 2010 Israeli company CENTCOM featured their mobile controlled scent generating device but didn't release the same till the date. In 2013 Japanese researcher invented a screen with scent. Recently by using the concept of virtual reality the 'Feel Real' masks (9 different scents) has been developed. Currently this technology is embedded with fashion also, as some researchers are also working on wearable Digi scent synthesizers, just to make their runways fragrant. Though scientists are working on same domain for advancement.

#### IV. METHODOLOGY

For preparation of scent we have to take certain ingredients in a particular quantity. The ingredients may contains essential oil, jojoba oil, alcohol, essence. For development of digital scent or artificial smell we require combination of hardware and software. So that we can store, retrieve, send, receive or broadcast artificial smell. As every color contains spectrum, scent also.



**Figure 1:** Communication model of digital scent technology.

As shown in Fig.1 basic communication model is been given. By using Scent index any digital scent device can identify different smells. Depending upon chemical makeup bonding with scent spectrum scent is been indexed [3]. With the help of olfactometer and indexed scent, artificial scent is been digitalized. The resultant file then embedded with the web content using World Wide Web. This process is done at sender side. At receiver side when user opens this file, the respective device gets activated. The artificial scent synthesizer identifies the file and recreates the same aroma which is sent by the sender. This digitally encoded file is sent by using scent bus. Hence, receiver will receive it in the form of vapor [1].

#### 4.1 Hardware Devices

For implementation of artificial scent one can use combination of hardware and software. Depending upon the triggering of particular smell formulation that particular smell is been ....

#### *Smell o vision scent energizer*

The structure as shown in Fig 2 in the upper right-hand corner connects to tubes that carry the scents to the theater above. Mike Todd Jr. and Hans Laube work together to implement smell o vision.



**Figure 2:** Mike Todd Jr. looks on as Hans Laube fiddles with his scent energizer on the night of its world premiere.

In late 1950's Hans Laube introduced the concept of smell o vision in his movie know as 'Scent of mystery'. There is a publicity picture of Mike Todd Jr. and Laube sitting either side of the Smell-O-Vision master control system, or "scent energizer," which resembled a complex piece of scientific machinery. It was described in the souvenir program as a "mechanical monster": "Made of stainless steel, specially treated rubber, and glass, it looks like something out of an Atomic plant." The device, manufactured by Be lock Instrument Corporation, housed a carousel of eight-inch vials each containing the highly concentrated essence of a specific scent, and had a bank of dials to regulate the concentration of odors.[web ref.1]

***Smell recorder:***

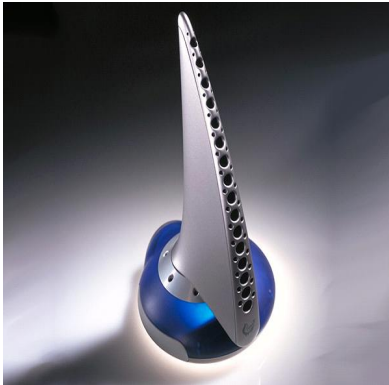
One can use 'Reminiscent' a standard database of all smell. These are standard smell that are licensed to developers for particular game, website, E-mail and so on [4].

***Smell synthesizer:***

Smell synthesizers are devices which are used to generate the smell in accordance with the digitized file that is transmitted through the web. The scent synthesizers are interfaced with our personal computer over a USB port. It can be programmed or installed and it generates a small quantity of smell vapors into the surrounding that is enough to feel the smell.

***iSmell:***

The iSmell technology or iSmell Personal Scent Synthesizer is developed by Digi Scents Inc. in year 1999. The proprietors of this company was Joel Bellenson and Dexter Smith. iSmell is a small device that can be connected to a computer through a USB port and powered using any ordinary electrical outlet. It can synthesize and create new smells by combining certain combinations of other scents. These newly created odors can be used to closely replicate common natural and manmade odors. Around 122 different scents were dispensed whenever there is a trigger, the chemical spectrum dissolve in air and air is directed towards the user. The device appearance is same as shark's fin with different holes on it to dispense scents from it [2]. Whenever this iSmell runs out of stored scents, the cartage like equipment will refill the iSmell full of scents.



**Figure 3:** iSmell (V1)



**Figure 4:** iSmell (V2)



**Figure 5:** Cartridge

**E-nose:**

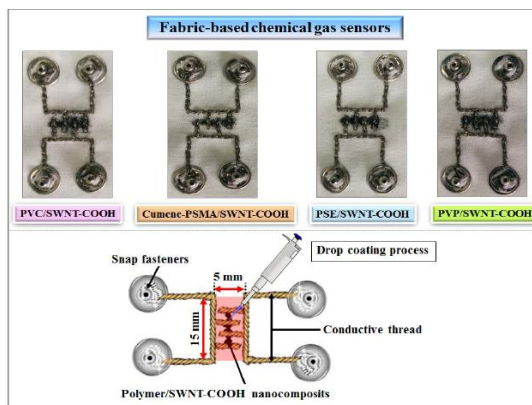
Scentography Electronic noses and tongues are sensors designed to mimic the sensorial abilities of humans in detection of complex mixtures of chemical substances, also of biological origin.

**Scentography**

Scentography is a device that permits incorporation of scents with traditional digital multimedia such as games, DVDs and web sites. The capability to digitize and broadcast scents will enable the dealers and consumers to send scented mail, make and watch scented DVDs, and play scented games.

**Fabric Based Scent Sensors**

Fabric-based chemical gas sensors were fabricated by two main processes: drop coating and embroidery [4]. The sensors were tested with various volatile components such as ammonium hydroxide, ethanol, pyridine, trimethylamine, methanol and acetone which are commonly found in the wastes released from the human body [5]. These sensors were used to detect and discriminate between the body odors of different regions and exist in various forms such as the urine, armpit and exhaled breath odor.



**Figure 6:** Fabric sensor

**V. APPLICATIONS**

Artificial smell is widely applied in various sectors as given below:

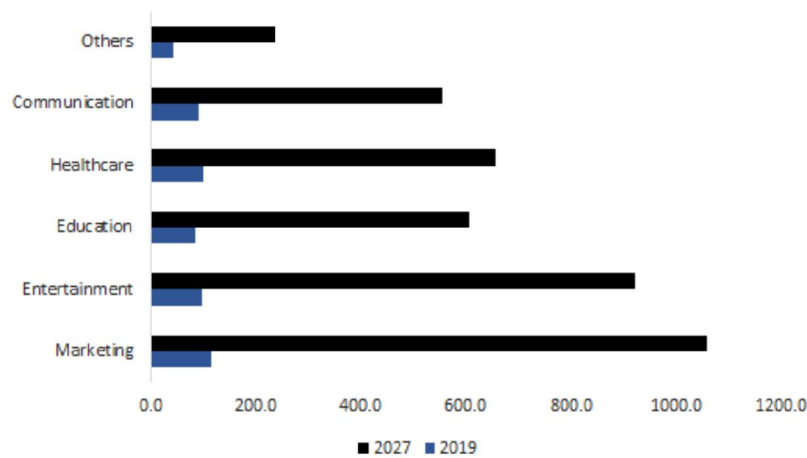
- **Medical:** Aromatherapy is a kind of curing certain disease by using different types of smell. It helps in discriminating brain disorders.

- **Education:** Scent is an effective teaching tool for subjects such as Geography, History and Science.
- **E-Commerce:** This technology provides live shopping experiences. This enables to buy perfumes, flowers and food beverages from exotic places.
- **Military:** Artificial smell is used in defense so that soldiers and officers can detect explosives, gun powder, and grenade in order to detect suspicious activity and to prevent any loss
- **Cosmetics:** Mostly in every cosmetic product there is a small part of perfume is placed, just to feel fresh and energetic. Before buying any product online, one can test its fragrance.

**5.1 Market: Application Dynamic (USD Millions)**

Growing emergence of virtual reality and its applications in the entertainment sector and higher penetration for the highly immersed experience for gaming, videos and movies are deliberately helping in the marker growth. Both the over the theatre and over the television cinema experience can be highly augmented incorporating the digital scent technologies [6].

**DIGITAL SCENT TECHNOLOGIES MARKET: APPLICATION DYNAMICS (USD MILLION)**



**Figure:** Market sales analysis for Artificial Smell.

**VI. CONCLUSION**

A Scent has a strange power over human beings. It can boost energy, mood and confidence. It gives us foreshadowing or ambiance. It can intensify emotions such as fear or love. Digital scent or artificial scent can give the sensation of virtual reality and suspension of disbelief. “The Sense of smell is closely tied to memory and emotion, making scent a powerful way to reinforce ideas”. So that Digital scent or Artificial scent also get remembered by any individual, this will help mainly in domains like, advertisement, entertainment, health, education and many more. Hence I conclude that this Digital scent or artificial scent will revolutionized the world. In creation of product, at any level we will require this device, such as for sending a scented mail, projecting scented movies and songs, advertisement of any cosmetics, healthcare product, we must requires Digital scent or Artificial scent. This technology will become our need in future.

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