



## SMART TOILETS: HYGIENIC FUTURE OF INDIA

V.V. Nagare\* and A. Mahadik

Zeal Institute of Management and Computer Application

Narhe, Pune, Maharashtra, India.

\*Corresponding Author: [vikrant.nagarepatil@gmail.com](mailto:vikrant.nagarepatil@gmail.com)

: [rt.am@gmail.com](mailto:rt.am@gmail.com)

### ABSTRACT:

Developing nations are growing rapidly into various respective fields and there is indeed revolutionary rise in the commercial aspects with the help of government initiatives and economic development. Adding to this, various other factors like growing urbanization, technological advancement has brought a significant change in lifestyle of people. The upgrading lifestyle demands to have adequate comfort, trending fashion, better sanitary facilities and this ultimately has led people towards adoption of new, sophisticated technologies. Increasing sanitary demands have now created a good demand for savvy toilets. The rising concerns regarding hygiene and contagious diseases are boosting the growth of smart toilet market. IT companies have played a significant part in the growth of smart toilet market. The hectic work culture of the IT industry, long working hours and large employee sizes have prevailed enterprise management team has resulted in the demand for more stylish interiors, and hygiene proof smart toilets specifically for the female employees is further fuelling the market growth. A smart toilet is as a toilet device that automatically opens up and flushes a urinal pot when the user finishes using it. It comprises of components such as water jets, bottom washers, blow dryers, and artificial flush sounds. It can be used for checking medical functions such as urine and stool analysis for body monitoring. The Smart Toilet has numerous application in different fields of commercial, residential, and healthcare sector. The growing aging population, increasing urbanization, increased awareness for water and energy conservation, increased people's hygiene needs are some of the major factors increasing the growth of smart. This research paper aims to understand the market scenario & how smart toilets can build a hygienic and healthy future in India.

**Key words:** - *Smart toilets, hygiene, India, technology.*

### INTRODUCTION:

We are living in 21st century the era of Science & Technology, where everything is easy and sophisticated. Everything is changing. So are we and our habits, lifestyle, choices and much more. Earlier man was unaware of his needs but now look he has changed into such an incredible resource that not only learns about the technology but also shares it with the world for betterment of others. Technology has not only evolved since ages but also has turned out the entire world into a "global village".

When all such changes are being experienced the one such aspect which keeps an individual free from all the insalubrious, filthy conditions is "Hygiene". Hygiene is one such parameter of living which monitors one's health and

cleanliness. When it comes to hygiene we all get conscious, we use cleaned towels, wash vegetables, keep our homes clean out of dust, etc. it is seen that now hygiene is considered the most when it comes to maintaining our personal health/care. When hygiene is so vital for living then YES! how come toilet seats will lack behind in this race!!! A study says on an average a human (male/female) goes atleast 7-8 times a day to pee if a person drinks 4-5 litres water a day. Again here, the picture comes of "clean and hygienic" toilets. One might ask WHY? the answer lies in the context of medical terminologies. As a dirty toilet contains harmful germs and bacteria. And its the place where these dangerous germs attack the human body by getting into direct contact through toilet seat.

To control this hazardous action which might create numerous health disorders it's very important to keep the toilet seats, washrooms clean and clear.

Technology has shown wonders and changed millions of lives. Let it be a Smartphone or an electronic device in kitchen. It has made life easy, compatible and surpassing.

When everything is changing then how can Toilets stay back in this race. When it comes to personal care, whatever you use matters a lot. As it is your health that's going to count the number of years you are going to live. Now a days we encounter many outbreak of diseases. And the primary reason is due to spreading of germs they spread vigorously and speedily. If not ceased on time, one experiences huge loss over health issues. Here, it becomes very important to figure out such places from where the germs take birth originally. And toilet is one such place where accumulation of germs is on a high pitch.

#### **OBJECTIVES OF THE STUDY**

1. To explore the current trends in the market related to smart toilets.
2. To study the overall usage of smart toilets all over the world.
3. Understand how smart toilets can build a hygienic and healthy future in India.

#### **RESEARCH METHODOLOGY**

We reviewed the relevant literature and analyzed secondary data available on smart toilet related information. This paper is purely based on exploratory research which used secondary data and information sourced from libraries, relevant books, journals, magazines, articles, media reports and various government portals like Swachh Bharat Mission, Smart Toilet Market research reports etc. The authors adopted to have greater accuracy and in depth analysis of the research study. Available secondary data was extensively used for the study.

#### **GLOBAL SCENARIO OF SMART TOILETS**

The worldwide savvy latrine showcase size was esteemed at USD 6.4 billion out of 2018. The rising need for helpful sterile cleanliness items among the shoppers is relied upon to stay a good factor for the market development in the coming years. These items are accessible in a fired can plan, alongside in-manufactured offices including air dryer and warming water. It has been seen that smart restroom items have become a style proclamation in developed countries including the U.S., U.K., Germany, and France. Besides, the industry members are offering inventive cleanliness advances including UV lighting, auto flush, Bluetooth availability, and auto open seat spread to give better restroom experience to the buyers. In the course of recent years, interest for water preservation has been expanding at a worldwide level. Usage of different government activities in numerous nations on spreading mindfulness among shoppers about the prerequisite of water preservation is driving the individuals to expand spending on cutting edge items, including keen latrine vanities. According to an ongoing report, in the U.S., around 4.8 billion gallons of water are flushed as the day progressed. Keen toilets can utilize the least water with wise latrine seats, making them a sterile and helpful alternative from the purchasers' end. These items can advance the water and electrical vitality utilization in toilets, alongside giving a tasteful intrigue. It has been seen that brilliant toilets are stacked with various highlights including UV bacterial murdering light spout and hostile to bacterial seats. Besides, moving a tendency towards restroom beautification as a piece of the extravagant home stylistic layout is driving the individuals to buy these items. Rising usage of savvy toilets in the business land and neighbourliness areas is assuming a pivotal job in expanding the item's appropriation. Also, developing ubiquity of web

of things innovation and voice-controlled gear at the worldwide level is relied upon to open new market roads throughout the following hardly any years.

The business application section produced an income of USD 4.6 billion out of 2018. The enormous number of top of the line eateries, bars, inns, and shopping centers are introducing brilliant toilets to offer sterile types of assistance to their clients. Also, brilliant can be viewed as an extravagance item, which can be introduced in superior business places. The private application section is relied upon to extend at the quickest CAGR of 10.7% from 2019 to 2025. Rising significance of savvy home because of developing prerequisites relating to vitality conservation, press button control, and moving segment inclinations is relied upon to favourably affect the business development. These shrewd homes are highlighted with in-assembled parts including savvy LED and keen toilets. Such sort of cutting edge toilets are viewed as a significant piece of home stylistic layout. Lodging developers are giving pre-introduced shrewd toilets to their purchasers so as to give increasingly important ideas to them.

#### **MARKET DYNAMICS FOR SMART TOILETS:**

Expanding interest for savvy toilets from present-day patterns of shrewd homes, continuous innovative headways, and expanding selection of keen advancements in families and business and corporate structures are among a portion of the main considerations driving the development of the worldwide brilliant latrine advertise right now. Another factor driving interest in keen toilets is the rising interest from shoppers for helpful clean cleanliness items. Additionally, brilliant and insightful washroom items have become a style proclamation in creating nations, for example, the US, France, and Germany. These countries are offering more, key players in the worldwide smart latrine showcase like inventive cleanliness advances,

for example, auto flush, UV lighting, auto open seat spreads, and Bluetooth network for giving the best restroom experience to clients. As indicated by an ongoing report, it is said that 4.8 billion gallons of water is being utilized in toilets in the US. Looking forward to this concern and interest for water preservation comprehensively in the course of recent years has likewise brought about expanding interest for savvy toilets in the worldwide keen latrine showcase. Brilliant toilets can advance the least water and power utilization. Savvy segments of the can, for example, canny latrine seats make the way toward sparing water and power conceivable. Likewise, expanding fame of voice-controlled hardware and web of things innovation is relied upon to build interest for keen toilets in the worldwide savvy can advertise during the gauge time frame.

#### **CURRENT TRENDS: SMART TOILETS**

Since 1980, Japanese firms have been developing smart, cutting edge toilets for home, corporate, public use with the various relaxing and smart features. All the more as of late, specialists administering a European Union-subsidized venture called iToilet have started testing enhancements for older and incapacitated individuals, including mechanized toilets that modify their situation because of voice orders and profundity sensors that can distinguish if an individual has fallen. Toto's "Flowsky" can seems as though a customary can yet is intended to check for variations from the norm in pee stream that may flag bladder or prostate issues.

Smart toilets for use in private living arrangements using inter connection is one such innovation as this, web associated can that shields wellbeing by utilizing prudently put sensors and man-made consciousness to investigate squander. Such a latrine could identify early indications of infection and assist

individuals with overseeing interminable conditions, for example, diabetes.

Human waste contains loads of pieces of information about our wellbeing. Numerous infirmities leave their imprint in pee and dung, including diabetes, contaminations, kidney ailment, and malignant growth. The indications of difficulty can be recognized through cameras, substance examination, or different procedures, specialists state. You simply need to utilize it like you would some other latrine, yet it's doing such a lot of checking out of sight.

Indications of developing enthusiasm for brilliant toilets have risen as individuals' craving for wellbeing GPS beacons has developed. Google was as of late conceded a patent for a can that would check an individual's circulatory strain as they plunk down, alongside a few other wellbeing following washroom apparatuses.

### **Diminishing water squander**

Smart toilets survey show how much water is needed to flush every time, utilizing as meager as 0.6 gallons of water and actual quantity used by the toilet flush is 1.6 gallons by a standard toilet commode .

The advantages of this innovation increases further than simply singular family units. An ever increasing number of organizations are focusing on eco-accommodating plans of action, and putting resources into brilliant toilets is a simple method to incorporate ecologically well disposed rehearses into the workplace. The proportion of water flushed in a restaurant or open washroom, for example, is much higher than in a single nuclear family. Presenting toilets that save extra water for you with no additional effort could be an uncommon endeavour for associations and washrooms giving off an impression of being naturally insightful.

### **Ecological advantages**

Deforestation has been a natural issue for a long time, yet how standard toilets are contributing on a high level towards cutting down a huge chunk of trees. A dazzling 270,000 trees are either flushed or dumped in landfills each and every day, and 10% of that number is on account of bathroom tissue.

Since keen toilets utilize flexible water planes (or bidets) so as to 'tidy up', tissue is not, at this point a basic thing in the restroom. Regardless of whether a few people don't feel great with depending exclusively on the bidet, the measure of bathroom tissue utilized for cleaning a bidet is gradually decreased.

Moreover, the production of restroom tissue furthermore contributes to water waste, as it takes 37 gallons of water in order to make just one move of washroom tissue. Notwithstanding the way that it may seem, by all accounts, to be absurd to save water by cleaning ourselves with a bidet, the volume of water required by a bidet is simply not proportional to that of washroom tissue creation. Many smart toilets furthermore arranged with a sink consolidated with the top that in like manner finishes off the store. This infers the water you use to wash your hands will be reused to later flush the restroom.

Sanitary pads, moist clothes have furthermore been a characteristic fervently discussed issue starting late as the open cognizance of plastic sullying has gotten progressively imperative. The flushing of plastic down the restroom (or the drawn out use of them with everything taken into account) is essentially not acceptable. Wet dispensable garments are said to make up 93% of the material that causes sewage blockages, costing £100 million every year. Since bidets fundamentally fulfill a comparable limit as a soggy expendable material, this can astonishingly diminish the weight that damp dispensable garments are having on the earth.

### **The Hygienic advantages of savvy toilets**

By utilizing tissue and moist disposable clothes when setting off to the washroom, we can cause bothering just as an expanded danger of disease. This is especially valid for ladies (particularly those having recently conceived an offspring, who may even now be exceptionally delicate), who can have an expanded danger of urinary tract diseases from spreading microbes. Flushing with water as opposed to making pointless grating to delicate zones of the body is just undeniably progressively clean. The bidet cleans at a similar profundity that a shower gently washes off the germs.

### **By what means can a brilliant latrine improve your life?**

Keen toilets are a still an extravagance for some, individuals, despite the fact that they can help set aside cash just as give a more eco-accommodating way of life. Notwithstanding, for a few, smart toilets can be and have been phenomenal. The impact of sharp lavatory development can especially be seen concerning the experiences of people with disabilities. Now and then, smart toilets have changed individuals by offering them newly found independence in their regular day to day existence. For example, a sharp lavatory distributor in Australia has delineated the impact a savvy can made on a man who had lost the two his arms in a setback and required his loved one's steady help to use the washroom. He delineates the customer as 'changed man' considering his as of late found opportunity and trust at all troublesome of consistent endeavours.

Older individuals are likewise prone to profit by the convenience that a savvy can gives. For instance, numerous older individuals may think that it's hard to twist around so as to lift a latrine top, and can't wipe themselves appropriately because of comparable versatility issues. Utilizing a savvy latrine takes out these

issues and can assist with improving somebody's way of life, particularly in places with a high volume of individuals experiencing versatility issues, for example, nursing homes, medical clinics, and specialist's medical procedures.

### **Clean Toilets a beneficial venture**

Much the same as home collaborators, brilliant toilets will probably advance into the standard and become progressively moderate soon. Notwithstanding the way that the western market may even now progress toward this advancement with a specific extent of vulnerability, savvy toilets have the potential, both in the home and noticeable to everybody spaces, to improve individuals.

The 'without hands' demeanor of a smart toilets make it dynamic for individuals with handicaps, or even moms potty setting up their little children. The undeniably persistently sterile procedure of cleaning oneself with water instead of paper has as of late asked those inclined to contaminations that are reliably accomplished by something as major as moment living things make

.What's more, in our developing awareness of water squander and the negative effect on items, for example, moist disposable clothes being flushed down the latrine, the shrewd toilets are fit for decreasing natural strain on different levels.

### **FEATURES OF SMART TOILETS**

#### **i. Remote**

The main incredible element in the keen latrine is that each Smart can accompany a remote. This remote assists in utilizing each element that the insightful can offer.

#### **ii. Music**

It is an invigorating segment in the keen can. The keen restroom goes with preloaded music to play. The splendid can start playing music normally when you go into the bathroom or using the remote you can start the music at

whatever point and moreover you can change the tune using the remote.

### **iii. In Built Led Bulbs:**

Exactly when you enter the bathroom, the drove bulbs will subsequently turn on. This part sanctioned subject to the enveloping light. If it is dull, the LED light will be started normally. The LED light can be started using the remote or the controller.

### **iv. Programmed Cover and Seat opening and Closing:**

A smart toilet has a complete setup programmed for the user. Since the user arrives till he/she departs the entire process completes smoothly. And the user gets no problem operating any of the instruction/function. The smart functions in built perceives when the user approaches the toilet seat, and it will automatically open the can arrange and cover for your need. As same as various other options, you can use the remote to operate. In the wake of using the can, you don't have to close the seat or spread considering the way that the clever lavatory will do that duty regarding you. A couple of individuals reliably disregard to close the can arrange spread, yet the situation will be managed by the smart restroom now. You can be direct.

### **V. Programmed Flushing :**

At the point when you have used the can, it will subsequently flush the restroom. It can flush normally, yet it can flush the can full or eco flush reliant on the time in the can.

### **VI. Warmed Seat:**

The can arrange will be warmed to make you feel better and warm. The temperature can be controlled or set using the remote. The person's powerless zone can value this part.

### **VII. Clever lavatory:**

The warmed seat is the best experience of using a smart toilet. Monitoring temperature, weight, and position of cleaning water is all done spontaneously. The user has the complete

authorisation of taking the decision to set up the cleaning water temperature, weight, and position. The temperature and weight can be extended or decreased with respect to user need by using the remote controllers in the amazing restroom. It is definitely not hard to adjust the setting like water temperature, weight, and position using the remote. These settings can be saved in a particular customer profile so every time a comparative plan can be recouped to use it without setting again.

### **VIII. Warm air Blower and Dryer:**

There is a warm air blower in the can bowl and the foot an area of the can. In the wake of cleaning the warm air blower in the bowl helps with keeping the bowl dry. The warm air blower in the foot zone starts normally when we sit on the can. The temperature of the warmed air blower can be the controller and besides it might be killed or on using the remote.

### **IX. Self-Cleaning :**

The smart toilet can self-clean itself. The Toilet will flush in a perfect manner each time after use. Every 24 hours once or at the pre-decided time the can will use automatic functioning to clean the washroom. The Ultraviolet bars will isolate anything inside the bowl an area and along these lines flush it to clean it. Once cleaned by the striking bars by then water will be flushed to clean and the warm air blowers will dryer the bowl zone. The above procedure ensures the complete cleaning of the smart toilet. In the wake of everything, the toilet cleans up normally to guarantee it is new as new. There is a manual cleaning decision in like manner open in the restroom.

### **X. Water-Saving**

Savvy toilets are the kind of water helpful toilets. These shrewd toilets use less water showed up contrastingly as indicated by the accompanying standard toilets and moreover have choices for full flush and eco flush. With the twofold flush decision and the less water to

flush the restroom, these toilets are water saving toilets. A bit of the savvy toilets use siphonic and similarly as a vacuum to improve the flushing and reduce the water use.

### **MENTIONABLE FACTORS ABOUT THE SMART TOILETS**

#### **• Solid Benefits**

Smart toilets have highlights, for example, aromatic and sickness check which offers success related associations. It updates blood dispersing in the body and ruins gagging of different pains in the body while malady evaluation helps in ailment control. In future advanced toilets may be offering heading to ordinarily contracted ailments through the presentation of Machine learning a field of artificial information.

#### **• Agreeable**

You can't differentiate smart toilets and basic toilets with respect to comfort. A restroom that flushes similarly as plays music; can arrange heats up automatically, cleans, etc offer the best comfort to be anytime found in a toilet/bathroom.

#### **• Sterile**

Bacteria, germs, viruses are not seen by naked human eye. In toilets, we can't see but feel too many invisible creatures are around us. We do clean toilets with auxiliary toilet cleaning equipment, but that's not all by which we can maintain cleanliness and hygiene of our toilets. Smart Toilets with the help of technology using UV lights reach each and every part of the toilet components. Making it sterile with no germs, bacteria or any other dangerous invisible creatures.

#### **Finding of the Study:**

It has been found that through this research, India may have assembled more than one crore toilets in a year under Prime Minister Narendra Modi's pet program Swachh Bharat Abhiyan, anyway it doesn't appear to have accomplished speedy lead change. Not, regardless, a huge part

of the toilets worked under the neatness urgent being used, an all-India study drove by the National Sample Survey Office (NSSO) has revealed. While just 46% of 95 lakh toilets worked in common India are being used, the figure is hardly half even in urban districts.

- It has been found that, Smart toilets can help fill in the gaps giving people more control and awareness of their own health and bodies.

- Smart toilets can also monitor health issues. People can readily take preventive measures to cure their diagnosis as faces and urine give a detailed information of various health concerns.

- Smart toilets can help protect user's health.

### **FUTURE SCOPE OF THE STUDY**

The study highlights the various concerns related to the use of toilets in today's era. A smart toilet is one such solution that will give a positive result towards the emerging hygiene issues. This study can be carried forward by other research members by making a more brief examination of the challenges that are being faced and barriers towards the usage of the smart toilets. Explaining more about the benefits that smart toilets holds with them are being ignored by the people. Researchers can come up with innovative insights that can create urge and need of using savvy toilets.

### **CONCLUSION:**

1. Thus by using technologies in smarter way, we can maintain cleanliness which is next to godliness.
2. Smart toilets suggest several innovative designs for toilet practices.
3. Smart toilets monitor and analyse various signs of diseases and thus it has huge scope in maintaining the health of a person.
4. Smart Toilets are going to make a remarkable and dynamic change into the lifestyle of users and also the hygiene needs of people with a

refreshing experience and maintaining health issues. It is going to change the scenario of traditional toilets giving it a punch of technology.

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Tables and Figure

