***Brief Title of the Project (Max. 100 Chars)***

*Human faeces which is 75% water and 25% organic material is flushed using approximately 6 litres of water after each use. If this 75% of water is extracted in the water seal after defecation the water requirement to flush remaining 25% organic materials can be reduced to one full 6 litres flush a day.*

*The main concerns are 1) sighting 2) odour 3) hygiene in achieving the above water saving.*

*RaVikas “KAKOOS” a patent pending innovation combines products & process into one linear function where initial studies have shown that water requirement in flushing is reduced by 90% approximately.*

**Tell us about your project (Max. 2000 Chars)**

*Existing flush based toilets encounter this triad of challenges to stay functional*

*1. Water for flushing after use.*

*2. Waste removal network or system*

*3. Increasing costs to own & maintain the system.*

*Rapid depletion in water as resource is forcing people to buy water for their daily use, where approximately 30 % of water per day is lost in maintaining a water based toilet.Till date no alternatives to water based toilets exist.*

*Flushing water accomplishes a) washes down(often corralates to sanitization) the WC, b)reduces odor(a masking effect caused by wetting) c) moves feces away from visual range.*

*KAKOOS is a simple retrofitted solution which converts existing water based toilets without any civil costs*

*Kakoos aims to fulfill emotional, personal, social, environmental and ethical demands of users*

*Emotional: a visually clean and odorfreetoilet pan*

*Personal: Safe & hygeinic to use*

*Social: Easy to clean & maintain for others to use*

*Environmental: Reduce pollution & use of natural resouces(water)*

*Ethical: Help end manual scavenging & septic/sewer line diving to clean*

*Financial: Cost effective to own and maintain*

*Emotional: a visually clean and odorfreetoilet pan*

***Visually pleasing & Odourless***

*Kakoos, has incorporated a no view flap placed over the water seal at an angle and distance that it completely screens the view of the water seal to the user. The advantage of this design is it screens view even to the user after use offering always clean view.*

*Twin systems control odor by odor suppression and odor reduction. Odor suppression by ozone generation where the insides of the basin is washed with ozonated air, and activated by a proximity sensor switch. Odor reduction is by self populating enzymatic water in flush tanks, which reduce odor by digestion of organic materials in feces & urine when micro flushed.*

*Personal: Safe & hygienic to use*

***Hygienic & safe***

*Fitted with an uV system ensures, user determined irradiated disinfection before & after every use which improves hygeince factor a few times over.Reduction in flush water ensures there is no microphillic spraying of microbial mix found in water seal which settle on every everything within a 5~7 feet radius in the toilets when flushing. The view guard also contains the sparying by its positioning within the toilet basin making it safe for all users.*

*Social: Easy to clean & maintain for others to use*

***Easy to maintain***

*Screwless fixing makes it easy to fix/remove for deep cleaning purposes when required, coupled with an object guard which stops any foreign object from entering the sewer pipe thus providing obstruction less function, which results in reducing maintenance costs.*

*Environmental: Reduce pollution & use of natural resouces(water)*

***Reduce pollution & use of natural resouces(water)***

*The philosophy of design is digestion with human safe microorganisms, derived from edible materials, to mimic digestion to break down solids. In this process feces is rendered almost odorless eliminating the need for toxic chemical deodorizers and sanitizers which pollute environments. Moreoverthis conversion reduces the water for flushing to a bare minimum saving water*

*Ethical: Help end manual scavenging & septic/sewer line diving to clean*

***Help end manual scavenging & septic/sewer line diving to clean***

*These microorganisms start to populate within the septic lines leading from home to septic tanks sewer lines, continue scavenging the feces for food as it travels down the entire feces is digested within the septic lines or in septic/sewer lines eliminating need for scavenging. The object guard placed within the water seal largely prevents any foreign objects entering the septic lines ensuring reduction in need to dive in to clean chocked lines.*

*Financial: Cost effective to own and maintain*

***Cost effective to ownand maintain***

*This one time investment is extremely cost effective, which substantially reduces flushing water demand to less than 5%,with no moving parts, and no regular supply of bio cultures.*

*To sum up*

***Tangible benefits(measurable)***

1. *Aesthetically appealing with no view of water seal even when used*
2. *Functions with 250 ml short flush after each use* ***saving 90% of flushing water daily***
3. *Improves hygiene by offering disinfection before and after each use*
4. *Microphillic spraying of water seal contents when flushing in side toilet is reduced which brings down nasal, oral and physical contaminantion*
5. *Retrofits into existing toilets without any capital costs.*
6. *Eliminates need for harmful chemical cleaners& deodorizers*
7. *Prevents chocking in sewer pipes by foreign objects*
8. *Extends retention capacity of existing septic tanks multifold*
9. *Improves performance of STP with reduced loading and need for additive bio cultures*

**Details of the Project highlighting Innovative features (Max. 4000 Chars)**

*The main concerns are 1) sighting 2) odour 3) hygiene in achieving the above water saving. Additional concern is chocking toilets by user abuse.*

*Description of ways how each of these above concerns are addressed*

1. *Sighting: A hinged (No-view) flap is placed inside the toilet bowl which pivots down during use to let faeces slide down into the water seal.*

*No view flap improves user comfort levels by eliminating view of their own faeces after use.*

*No view flap minimizes micro spraying normally experienced in regular toilets where microscopic water droplets of water seal gush out from within the bowl as fine spray when flushed and settle on all objects inside the toilet.*

1. *Odour: Odour suppression and reduction is obtained by adopting a twin-level approach, where an ozonator fixed to the toilet at an unobtrusive place air washes the inner side of the bowl at factory set intervals.*

*Ozone being the most potent deodorant known to humans keeps the toilet bowl odour free even during repeated regular use.*

*Odour reduction is further enhanced by after use flushing of toilet, where enzymatic liquid is flushed after use instead of regular water.*

*This enzyme dissolves solid faeces to liquid releasing the water content in the faeces there by enabling organic material to flow down into the sewer pipe, once past the water seal any odours cannot return back into the toilet bowl.*

1. *Hygiene: Sitting on the toilet bowl can be unhygienic where women suffer the most, so most adopt different techniques to avoid contact but still get infected. This most difficult to achieve factor is achieved by adopting sterilization & disinfection.*

*Ozone is a potent germicide, ozonated air flushing in to render the space odourless also sterilizes the insides of the bowl, today ozone sterilization is finding acceptance in our kitchen to wash food items before use.*

*Disinfection by irradiating the toilet bowl to Uv light exposure. improves hygiene many folds making the toilet safe to use. This function is user defined as pre/post or both times before and after use.*

*Chocking toilets is a nightmare to people who maintain toilets, where they often disrupt the entire network of toilets connected to those lines. This not only disrupts usage but also costs heavy to restore, this challenge is overcome with a object screen within the water seal, which only permit liquid & viscous material pass through retaining most object within the water seal making removal at source simpler and cost efficient*

*Still, we do not feel comfortable and complete if we don’t flush after use, this emotional ethical and social need is addressed with a 250 ml flush after each use where the water is now enzymatic water instead of regular water which converts solids into liquids.*

*The above process reduces water requirement after every defecation to under 250 ml from present 6 litres.*

***Details of the Project highlighting Commercial Impact (Max. 4000 Chars)***

Water is the game changer here. Affordability no longer ensures availability,is forcing for alternates. Water for flusing a luxury which no longer people can afford. This need is felt more by non households most who will be interested to adopt this water saving product which offers them the comfort of providing a much better solution at less than a fraction of costs.

Lets postulate this numbers to understand the commercial impact

A company with 100 employees

Employee ratio 55% Men & 45% Women

Flush Water after use in urinals-3 liters

Flush water after use in toilets-6 liters

Average water flushed in urinal per month Men & Women combined-20,268

Average water flushed in toilet per month Men & Women combined-7,236

Total water spent on flushing per month-27864

Cost of water/liter(source to sewage)-0.53\* paise(\*CMWSSWB rates of 2013-14)

Per month cost of water spent on flush-27864 liters x 0.53 paise=14,768 per month

KAKOOS reduces flushing water consumption by 90%

Total water spent on flushing per month =27864x 10% =2768 litres

Per month cost of water spent on flush =2768x 0.53 paise=1476 per month.

With this phenomenal saving possible every month this will be a welcome product which will interest any commercial establishment.

***Details of the Project highlighting Commercial Strategy (Max. 4000 Chars)***

Commercial strategy will be to focus on businessess which have employee wellness included into their company policy , where they have the mandate, budget and training facility to introduce this product. A disruptive innovation, of this kind will encounter stiff resistance from all round and will need engagement with customers to make realize its benefits address their freas and above all make them experience its benefits.

To do this equal support from the organization is essential whichwill not only be driven by the benefits it offers to its employees but also by the huge savings it can make to its finances. Once people are convinced in this B2B model, users themselves will drive the B2C model where this unit will find acceptance at homes. The business will only focus on B2B during early stages in companies where they have larger numbers to take care of.

***Details of the Project highlighting Business Feasibility of Idea (Max. 4000 Chars)***

KAKOOS is the 5th generation of MVP, iterated over last seven years the last three years have been in actual locations across India where a combined total of 10 units serving approximately 300+ people daily and saving approximately 3000 liters of water daily are functional in states of Haryana, Manipur, Hyderabad,Karnataka & Tamilandu. All pilots are functional till date and learning from their use over the last few years has crystalized into this product. Hence this is a working prototype which needs to be scaled up for aggressive validation with larger numbers across more locations to enable certification and accreditation. Once these are done can be made available in the market as a product for public consumption.

***Details of the Project highlighting Risk & Mitigation factors identied (Max. 4000 Chars)***

Challenges before KAKOOS in existing markets

1. Emotional block to have fresh feces in water seal
2. Resistance to change
3. Skeptical about performance, odor & hygiene
4. Needs education & advertising to enter market
5. Water not considered dwindling resource
6. Let someone validate & try first

These considerations led to the commercial strategy described before where the product will only be a B2B model in places like public restrooms within places where people frequent but have little say on the decisions made with an option to use or not use was first thought of as the best place to launch , but if people are not educated about it time taken for acceptability and negative publicity by ignorant or aggressive use can create a greater challenge for acceptance , hence the model of reaching MNC’s with a wellness mandate was chosen as the primary target to introduce the product, where people had a say , have a an opportunity to be educated about its usefulness and above all they cannot reverse a policy decision which helps the company both by improving their contribution towards an eco-sensitive process and also helping them improve their financial line without foregoing their employee wellness.

Timelines (in months) Funding Required for next 3 years (in rupees)

24 months INR 1,20,00000.00

Business Plan for next 5 years (Commercialization Strategy & Business Feasibility) (Max. 4000 Chars)

The business plan will be a fast track plan where having already developed 5 MVP’s the focus now will be to validate the product, evaluate its parameters tweak its performance’s , get certified with necessary agencies’, and start manufacturing commercially within the next 24 months.

The plan has three phases of eight months each, where the first eight months will be in manufacturing, of a minimum quantity units for validation month after month with regular improvements on the feedback received regularly every two months an improved version will replace the existing one at same locations while expanding the number by 20% so by end of 8 months 4 updated versions will be evaluated and this will form the base for the near perfect model which will undergo validation for the next three months, by end of year one not only the units will be validated necessary certifications obtained but also a near market ready product will be available for launch.

Having used the units during testing phase those companies will now be approached for they would have not only satisfied themselves with the performance and attributes of the product but would have data available with them on the substantial saving they could make in the last one year from water. So, these companies will now be approached to issue a purchase order to retrofit all their toilets with KAKOOS.

Having bagged at least 3 major companies after a year of close interaction, efforts now will be focused on large scale manufacturing and sourcing partners to supply components or materials to manufacture along with identifying the distribution network through which business will operate and expand. Six months into the second year all units will be evaluated for their performance and adherence to all said norms and will be validated which will help to finalize the product, make master die, mold’s focusing on mass manufacturing process and start to arrive at cost of product

***How do you feel that your idea would be relevant to Oil & Gas PSUs (Max 4000 Chars)***

Toilets in all outlets of Oil & Gas PSU will benefit from this product. Mandated to maintain restrooms most find it difficult to do so due to water and associated issues.The solution mentined above will end problems faced by outlets and help them maintain a quality toilet offering safe sanitation to their customers.

Team Capability to deliver the project (Max 4000 Chars)

Teaam consists of

Ravi Senji-Innovator

Pooja Ravi Senji-Women health & wellness issues design & HR head

Mr. Raghunath-Marketing & Business promotion

Mr. Sivaprasad- Auditor

Mr. Manoj Pillai- Legal

Advisors

Mr. Sudarshan-Financial advisor

Prof Veervalli- Business Development

Mr-Chandrasekar-Bio enzyme Research & standardization

Dr Mahalakshmi-Bio Enzyme Research

Mr Mukesh- Employee engagement& benefits