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Krishna Mechanism – Patented Technology for Circular Economy & Life

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ABSTRACT

Circular economy (CE) is the need of the day. Use & throw culture has left unbearable carbon foot prints. Every effort for promotion of CE is done by UN. Waste impacting the air, water land, space is minimised using CE projects. This paper elaborates'Krishna Mechanism' for water purification. GOI is promoting 'mission Life' using Life style management, for promotion of circular economy. Krishna mechanism aligns to this concept. Title prompts, the ancient connectwith current technology, inline with our national 'Life mission' to lead CE globally.

Krishna Mechanism is a Water purifier project with prompts using messagingtechnology for water impurity detection, purification, treatment, alternate application prompts with chatbot solution. We are the technology developer&are pleased to share the patented technology for all for the Life style management mission called 'life' promoted by PMO office with 2030 goal, relating it with certification.

This study aims to share patented technology called Krishna for Green Initiatives as defined by 'life,' Relation for acceptance and successful deployment of such CE drives with certification, using paired T test with 11 random samples, we conclude- Use of such devices religiously will necessarily ensure preventive care, like the 'Devine protection' for 'Life'.

Key words- Chatbot, Circular Economy, Water gradation & Prompts, 'Life'

INTRODUCTION

CGWR – Centre for Ground Water Research of GOI is themission to control the use, and contamination of ground water. Labs are required to be NABET certified to achieve the Water & related work sanctions. Ground water purity, consumption, contamination is a prime concern, due to Industrialisation and agricultural pesticides residues.

The water reservoirs if contaminated can lead to mass killing and/or bioaccumulation. Afolk story of *Kalia, and the Lord Krishna, to purify the river Yamuna from the poisonous effect is well known.* The '*Namami Gange'* mission to purify the River Ganga has triggered this project using technology for detection, purification or alternate application prompt, and communication module a necessity at the usage level.

In business model innovation, creating value is the core, and "Technology" and "Innovation" are the driving force of value creating. Regulations and incentives are the main boosters of successful cases, with their niches lying in decreasing overall cost and compliance with the regulations, or riding the trend of environmental protection, thus allowing firms to innovate or invent new operating models' development. However, these drives

are voluntary the cost of treatment can be so high that small entrepreneurs avoid such treatment. The GOI initiatives like common ETP for clusters is very common. But can be adapt such model for house hold was a concern. We therefore worked on a mechanism and project that is patented, for house hold application at individual level and if needed expanded to society or area specific level.

Inspired from the '*Kalia Marden'* story we developed a patented processor called ***Krisha***. This is simple processor that using a chatbot analyse the sample and helps you deciding the treatment prompts and cost and probable alternate application for the water sample submitted.

The simple treatments for household levels are very low cost, and specific to the applications and impurities detected and common detection and prompts can save major cost, as per this mechanism.

CONCEPT

Let us understand the concept. - Life - India led global movement to nudge individual & community action to protect and preserve environment. It means life style for environment. There is need for all of us to come together and take lifestyle for environment forward as a mission. This is a mass movement towards the life style management. It considers transition from throw away culture to circular economy. Changing individual and community behaviour. Leading to projected 14 lakh crores of additional cost saving by 2030 for India.

McKinsey & Company pointed out that by adopting circular economy models, EU can save approximately USD630 billion of material cost annually and create EUR1.8 trillion economic benefit by 2030. Economic incentive package, but much prior to it we respected all the resources as Devine and were never throwing it out, by creative recycle, alternate application we were always trying to balance and reduce our waste burden on the earth.

India has a rich experience in implementing large scale behavioural change programs. The drive starts with Blue mission '***Swacch Sagar, Surakhit Sagar***'– meaning Clean Ocean, safe ocean. We have a longest Coastal area and water purification is the need of the day. We therefore have decided to start with the blue mission on water conservation and purification at individual level and community involvement where ever feasible.

We have developed the Krishna Mechanism for water, typically ground water contamination detection, treatment, if very costly, defining the application and Chatbot or messaging depending on demand. The mechanism and processes are patented, it includes -

1.: Examine and map water purity w.r.t. geographic water quality with geo tagging and water sources. Such results will be available for all residents using that water source with nominal charges, as the testing and if needed treatment cost is distributed over a large team of society using the same water source.

The Krishna Mechanism address following concerns and applications-

Water & its potential application -

i. Drinking, agriculture input and food preparation- Grade 3- potable
ii. Applications having skin contact during usage like bathing, washing or gardening grade 2
iii. Flushing and other noncritical application – Unrestricted recycle- Grade 1.
iv. Process application – Restricted recycle – like cooling, construction – Grade 0

For first three grades and application, water having undetected, untreated contaminants, has adverse health impacts. Such contamination at one location gets spread to another location by mixing through streams, or drainage lines. When mixed the control becomes very difficult.

Major sources of water contamination are -

i. Improper disposal of solid waste from House hold - scrap, like lead containers, sprays, perfumes tins, Nickel, cadmium batteries, coated material, plastic & other solid contaminants, not effectively disposed; getting absorbed by land, particulate matter of heavy metals getting mixed in water sources, causing ground-water contamination.
ii. Contaminated industrial waste, mixed in storm water, due to Improper disposal of hazardous material, like masks, glows used while handling biocides, Exhaust gases from industry and vehicles leading to acid rains etc.
iii. Contaminated agricultural waste, pesticide-coated seeds, processes causing contamination as spaying of pesticides & use of chemical fertilizers, etc.
iv. Heavy metals, getting mixed due to lead piping corrosion and storage corrosion getting mixed or industrial drainage line leakage mixed in storm water etc.
v. Sewage line leakage and mixing into sources.

There is lack of devise/ process prompting early detection and correction for contamination. Nor any process exists to facilitate the trend analysis and alarms/prompts to civil authorities, including water treatment plant authorities. This has resulted in incidences of heavy metals and/or pesticides contaminated well-water consumption leading to fatalities.

Current practice is rain water, stored water and ground water is treated, without considering the probable contaminants being spread. Neither home water, with or without purifier is subjected to potability tests, in full or partly for location specific contaminants.

Sensory tests like colour, smell and turbidity are considered adequate, for day to day applications, and simple remedies like boiling, filtering, alum treatment, are used, by users. RO is not used everywhere, especially in villages. Even in case of RO the membrane selection is not based on the impurities because contaminants are not known or are getting mixed.

In brief the problem is -

i. Lack of water soluble contaminant detection by testing either water, soil and/or from garden waste samples. As contaminants are absorbed from by the roots and are stored, hence can be detected from garden waste analysis.
ii. Lack of location specific purification process design based on contamination detected by prior testing.
iii. Lack of Alert service to prompt stakeholders for deviations, improvements, and restricted application based on water grading.

The closest related art is described as follows:

Biomass convertors are available for activated carbon/carbon like material, energy, fuel generation. This concept of getting activated carbon from garden waste after testing & grading based on localized contaminants is developed by us. However, if available from any other source is okay as this is not the focus.

Water purifiers with activated carbon are available, even simple perforated material with activated carbon in form of suitable unit is distributed to villages to solve their problems of turbidity, smell and TDS. As there is no source contaminant detection, in all these purifiers, purification process is generic, and have neither alerts, nor restricted application prompts, for deviation from norms. With grading and application, recommended treatment prompt the healthy and cost-effective use of water is feasible.

Water purifiers with LED indication to show the water turbidity are available in market, yet the most harmful chemicals are not tested or indicated.

No service to validate purifiers specific to local contaminants, and water potability, timely validation and maintenance services are not available.

Advantages presented by the ***Krishna Mechanism***are as follows:

[1] Garbage to Gold Convertor – i. Accurate local contaminant detection by testing garden waste, ii. Eco friendly disposing of garden waste, by value added activated carbon or other fuel application, iii. Process and grading prompts based on the analysis.

[2] DW2PW – Detect contaminants from garden Waste to Purify the water using i. Light weight, ii. modular, iii. scalable, iv. customized v. home, rural and agriculture applications, vi durable, vii build in Knowledge management data generation, viii Simple ix. design, specific to application, hence low-cost modules, that are interchangeable.

[3] MMI - If harmful contaminants observed, samples are preserved and alerts are initiated, based on user needs, and stake holders' expectation.

[4] Data processing, storage, communication Unit & option of Chatbot– i. Alerts to society - Socially Motivated, ii. Data storage- potability standards, local contaminants, permissible limits, sources, etc., iii. analysis facilities for adoptive intelligent decisions for processing, iv. grading -usage restrictions, typical application restrictions are for agricultural and drinking and food processing, skin contact (Grade 0, 1).

[5] Add on Service - Provide Household purifiers effectiveness reviews and improvisation, application restrictions based on localized contaminants detected during GGC. - Garbage to gold convertor – activated carbon developed during testing of contaminants

[6] Civil authorities, or recommended contact individuals alert for application restriction, to minimize the health impact, contaminants' source tracking and mitigating, avoiding further mixing, and spreading is initiated in most effective way.

[7] Alerts for agriculture application to minimize harmful residues in vegetation and fruits.

[8] Timely testing and maintenance service - Trend analysis, disposal, corrective, preventive & improvement actions, purification process effectiveness, add on contaminants if any detected, corrected and data base updated

[9] Awareness, prompts, alerts, timely purifier validation, maintenance based on location specific contaminant and treatment results user awareness, reducing water borne diseases, in that area.

[10] Develop recommendations to upgrade and strengthen circular economy to make it more relevant and effective in addressing emerging global challenges through alignment and synergies with national circular economy frameworks and practices

Output of MMI are –

[1] Periodic reminder for testing, purified maintenance validation

[2] Problem alarm listing the impurities & consequences to user

[3] Treatment prompt based on application, grading &reference

[4] Trend and data processing chatbot if already detected reports are submitted

Testing of garden waste tracks ground water soluble impurities, residues absorbed more effectively than alone soil, as roots go deeper. Localized contaminants are detected, confined through actions initiated by alert, improvement and corrections. The analysis helps in water grading and purifier modules adaption, based on reference logic and application.

Alerts are for early detection and correction based on localized testing, confining, mitigating, correcting, grading and application restrictions, of garden waste, soil, ground water, or water samples from house hold purifiers, if required as add on service.

Concept based on water contamination detection from garden waste, water & soil samples in area under consideration to

i. Identifies sources of contamination.
ii. Initiate at source corrective action
iii. Confine contamination,
iv. Purification Process adaption,
v. Water Application restrictions

Roots of plant go deep to absorb the water-soluble contaminants along with water, contaminants are detected by testing garden waste, thus identifying the water-soluble impurities in the ground water sources. If ground water is not used, then the tap water also can be tested for its impurities as per potability standards and anticipated local contaminants from the source, being geotagged.

The garden waste is converted using special convertor for getting activated carbon from it, if needed. - if no harmful contaminants observed. Water is fit to be used for consumption.

If observed, samples are preserved and alerts are initiated.

Test results are used for the trend analysis, disposal, corrective & preventive improvement actions, effectiveness to minimize the health impact and track and mitigate source contaminant.

Based on the contaminant level and risk, Adaptive Processing unit, using activated carbon with specially designed purifier material, specific to contaminants & the water application is used.

Awareness, prompts, alerts, timely purifier validation, maintenance based on location specific contaminant and treatment results in early detection of water borne diseases in that area.

Informing the civil authorities and users and other stake holders with help of test results, analysis to initiate deviation control, specific to location is add on service, as a part of MMI software. This mechanism called Krishna was first tested in analytical lab.

Alpha testing: 19th Sept. 2015

Beta testing: 30th September 2015

General release or sale: Not yet done, as patent was awaited, now the patent is awarded and we will proceed for the same.

Comments on product testing and release. - Not yet released,

Testing comments - Alarm and prompts, service reminders to stake holders with knowledge hub is essential like google location map, water quality and source contamination maps to be developed.

SDG and ESG are currently the initiatives more adopted into corporates as– Energy efficiency is more noticed than resource efficiency, Green finance and green jobs are taken more seriously, on this background this mechanism can be adapted for society and Industries. Life mission from GOI sinks well with the concept and deployment of such drives.

Krishna is an integration of Ancient wisdom and innovation, that that prevent the social and water related diseases byearly detection and correction. The role played by Lord Krishna in ancient time, is simulated by this devise. It offers support, using the Chatbot technology and group collective investment for societies and geographical zones based on water consumptionpattern in urban or rural side of society. For details refer Patent Number: 415449, Date of Grant: 26/12/2022.

Corporates are in different needs for green, Bluetransformations,the Moreaccepted and practiced, Management systems for Green Productivity (GP) are more mature and available we with help of Zen international systems have successfully implemented more than 12 GP projects in India, this is the first GP, which considerably impact the SDG and resource conservation and social health.Being the global trainer and incubator for environment systems and improvisation, we thought of relating this concept with corporates and their house holds for mass testing, and perception analysis. This concept is happy adapted by the corporates due to the circular economy potential.

Circular economy (CE)- CE concept is not realized by most of corporates but in practices such as using secondary materials for production. CE in other aspects than manufacturing is not much concerned. Guides, tools, training and innovative business models to achieve CE are needed but lacking typically for the blue technology. At source treatment and prompts if adapted by Industry and other applications like land use, will have considerable positive contribution to society. This can be the best ESG or SDG project for the corporates. Or it is in line with 'Life' drive of GoI. The projects that convert sea water into drinking water in Qatar and UAE are high cost investment. With Krishna the Purity of water as per budget & application and distributed level is feasible using common detection and prompt for application or treatment. This can be adapted by the leading chemical giants as a part of their corporate responsibility to detect the ground water contamination due to their land use. Most of the corporates have the precision instruments for the impurity detection, for them this is not additional investment, or even yes, it is for a noble cause, and can be sanctioned from the CSR budget. For households it will also control in a big way the use and throw attitude, & lead to conservation through awareness. The impact of life style on the treatment cost and potential health threat will be the key drivers to motivate the individuals in the society.

Circular Economy &'Life' linking with Ancient wisdomof Ancient Indian life style- eco-friendly & aligned to nature, can be still promoted with the benefits associated with it. Today we are realising the negative impacts of parting from the ancient wisdom, so realigning again to the 'life' mission promoted with technological appeal and same religious commitment might lead to a positive impact.

Now if we study the sustainable taxonomy for industries among APO MCs to help building up sustainability capacity, assist communications with financial institutions, facilitate the flow of financial, human and technical

capitals for sustainability purposes,prevent greenwashis a challenge to them. If we can link it to commitment like aligning to national Goal, like that of the religious control or lifestyle controls the promotions will be easy. To test this, simple circular economy project with simple treatment like Krishna deployment effectiveness with 11 random samples of with and without certifications were evaluated, and results are tabulated at the end. But to understand, the importance of it, let us understand the history of CE.

Circular Economy Action Plan passed in December 2015 by Directive (EU) 2019/904 – on the reduction of the impact of certain plastic products on the environment. And the EU formulated relevant action plans and regulations by January 1, 2022 to calculate and review the aforementioned goals. In India since ancient time the rivers are worshipped. In Indian House hold the gradation of material and clear directives for use like earthenware, metal ware and goldware and silverware are defined. If we consider the application the end of life disposal concept is built in it, since ancient times. We in ancient days, never used plastic but recyclable earthen pot was commonly used by all, now we faced the plastic issue as we found it easy and earthen pots were replaced by it, which can be reversed if we want to follow the 'Life' drive.

In Ancient India no financial incentives to support innovative designs for waste reduction and recycling-friendly designs was used, but the control and compliance was through to religious directives- rituals and lifestyle, culture. We never needed any external trigger for such measures, such as Formulate environmental protection eco-label standards, formulate quality standards for recycled plastics,Formulate green procurement standards, etc. But in India the incentive was related to rituals and controlled through Religious control, hence we have no issues like green wash or others. Similar analogy of religious control is currently followed during certification, so we thought of experimenting promotion of these concept in organisations with and without certification.

The promotion success using disciplined approach like ritual (SOP – Audits), is tested with 11 random samples, with and without certification. The hypothesis is tested if there is difference due to certification.

Ho = $\mu 0 = \mu 1$ – There is no significant difference with certification on usage and promotion circular economy projects like Krishna

Ha = $\mu 0 <> \mu 1$ – There is significant difference with certification on usage and promotion circular economy projects like Krishna

The Minitab test results are as bellows-

Without System Certification	With System Certification
20	25
21	24
22	24
18	23
21	24
20	30

20	30
21	24
19	24
18	23
17	25

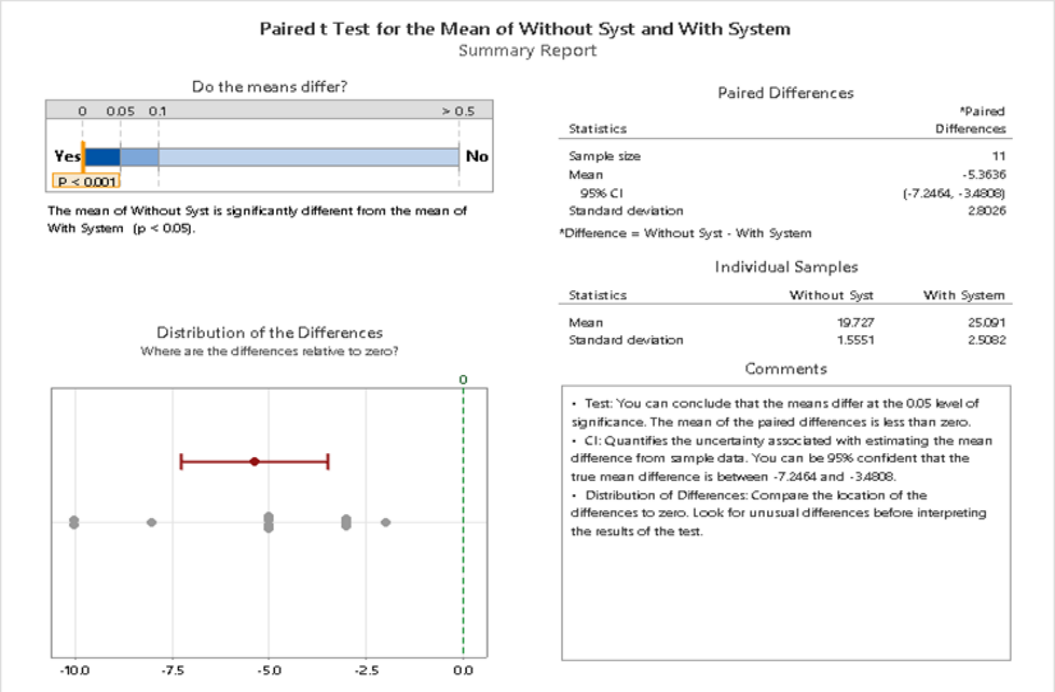
Descriptive Statistics

Sample	N	Mean	StDev	SE Mean
Without System Certification	11	19.727	1.555	0.469
With System Certification	11	25.091	2.508	0.756

Test

Null hypothesis	H_0: μ_difference = 0
Alternative hypothesis	H_1: μ_difference ≠ 0

T-Value	P-Value
-6.35	0.000



The Null Hypothesis is in rejection zone, hence alternate hypothesis is accepted. Comparing the values, we see, there is a positive correlation between the system certification and promotion. Which means not only the technology, but the discipline & commitment is equally important. In ancient days, this commitment was linked to Religious norm, so over generation the rituals are followed without violation as part of religious demand& consistency is achieved. With mission 'Life' similar commitment can be successfully deployed for using such circular economy projects.

Over a time,our ancient believes changed due to influence of other cultures and individual who could not understand the importance of commitment. The conclusion & rejection of all rituals as blind faith was the deterrent, and now with GoI 'Life', we will hopefully adapt our old lifestyle & promote it globally.

To blend the contempered life style management, a logical Chatbot is used. The updated research links, proven methodologies and current test levels are aligned with help of sensors. The water analysis and controls that of, or low-cost application is just of the glimpse of the potential one can aim at to relate the ancient mythological myths into logical interpretation and adapting to the way of life.

Krishan Mechanism is one attempt to prompt the way of life, relating to the level of pollutants, and treatment and prevention methodologies, if possible we can integrate it with the local authorities and ABHA – Ayush Bharat, the citizens' health data bank, and Life mission.

We have many more projects in line with our patent, feel free to write to us, or contact us, in case you need to integrate the logical Chatbot mechanism to any level, we will be happy to customise it for you, as an individual or society or an organisation.

CONCLUSION

Now time has come without parting with the benefits of our lifestyle and culture we need to adapt the technology. Adapting mechanism or projects sustenance with commitment is importantOffering choice if purification not cost effective, a prompt to use it for alternate applications which is feasible with this mechanism. Many customised versions can be offered, to take care of variety of needs of users, and end goal is circular economy, to suit the life style &water conservation and blue resource development through 'Life'- life style management. Any practice documented as standard practice becomes established system & if required can lead to certification.

We are sure similar experiments in future will trigger more and more innovations decoding the mythology and adapting technology with a commitment for minimising the adverse health impact and leading to circular economy drive, 'life' promotion& Environment conservation.

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