

Inventions of the Month

Wishing you a great year ahead!

We start a new series on Inventions of the Month.

CRAFITTI CONSULTING's
(www.crafitti.com)

Inventions of the Month** is a collection of inventions found by us while working on various Invention projects. We provide a preliminary analysis of these inventions on **the key functions and methods employed**. Using our Analytic Hierarchy Process (AHP) based Invention evaluation framework we rank ordered these inventions on relative Feasibility, Inventiveness and Value. **We look forward to your suggestions for the next month inventions and feedback.

Every month we will be selecting key inventions that we

found in our work or while carrying out research for invention projects. Our aim is to select interesting inventions described and available online. These are then analyzed by us in terms of **key function being performed** or **key system attribute impacted** by the invention and the method used. We showcase the use of Crafitti's **Strategic Invention Map** to carry out an assessment of the chosen inventions using the **Analytic Hierarchy Process (AHP)**. The key attributes are – Relative Feasibility, Relative Novelty and Relative Value. The methodology to analyze and carry out a rank ordering using strategic invention map is proprietary methodology.

To submit your IOM visit

<http://www.crafitti.com/invention-of-the-month.html>

Key Inventions

We found 7 interesting inventions this month.

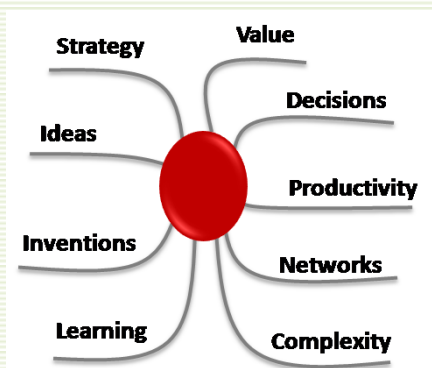
1. **DOLFI: Pocket Washing Machine**

Next-generation ultrasonic “washing machine” that fits in the palm of your hand is designed by Switzerland’s MPI Ultrasonics. The smartphone-sized gadget conveniently fits in any bathroom, suitcase, or purse. No need to splash out for your hotel’s laundry service, rack up dry-cleaning bills, or labor over a sink: The Dolfi promises to clean even delicate fabrics, such as silk or cashmere, with minimal water, energy, and fuss. Harnessing the “power of ultrasound” is easy. Simply place your garments in some water, add a squeeze of detergent, plop in the device, and turn it on. In 30 to 40 minutes, your clothes will be fresh and clean, ready for rinsing and hanging up to dry.

<http://www.ecouterre.com/dolphi-is-a-palm-sized-washing-machine-that-cleans-with-ultrasound/>

2. Self-Cleaning Dishes

ABOUT US



Crafitti Consulting is a global innovation research and consulting think tank started in 2008 incubated at the NSR Centre for Entrepreneurial Learning at IIM Bangalore. Today, our frameworks provide potent platforms to *innovate in crafting strategies, breakthrough products, new services, technological alternatives, patent portfolios, process design, embedding successful change* in organizations and training on innovation. Crafitti **co-craft innovation** by empowering ideas together with start-up, struck-up, sturdy and surviving organizations and all the minds working with us.

Washing dishes may soon be a thing of the past thanks to an incredible new coating that makes food simply roll off your plates and bowls. It sounds too good to be true, but according to Swedish design studio Tomorrow Machine, it's a very real solution to the wasteful (and not to mention laborious) task of washing dishes. The studio's self-washing dishes are imbued with a special coating and designed to mimic leaves of the lotus plant, so any water or dirt simply beads up and slips right off. Instead of using up gallons of water cleaning up after a meal, simply tip the waste straight into the compost. Sounds easy, right?

<http://inhabitat.com/incredible-self-cleaning-dishes-could-save-thousands-of-gallons-of-wasted-water-each-year/>

3. Interactive Paper Computer

The smartphone prototype, which is about the height and width of an iPhone, is so skinny you could slide it into the pocket of your tightest jeans and so flexible it could move with you while you walk. This tiny portable computer is operated by gestural movements — one literally bends it

in different directions — and it can do all that nifty stuff your smartphone can do. It makes phone calls, stores books and plays music — check out a demonstration video after the jump.

<http://inhabitat.com/worlds-first-interactive-paper-computer-promises-to-reinvent-the-digital-world/>

4. LifeStraw - Making Filthiest Water Drinkable

LifeStraw created a water filter that closely replicates a drinking straw, converting the most contaminated water into clean safe, drinking water. Though LifeStraw products are vital tools for about 780 million people who don't have ready access to safe drinking water, it is their drinking-straw-like invention of the same name that has received plenty of attention. It is lightweight, at only 56 grams (2 ounces), made of durable plastic, chemical free, and doesn't require electricity. The most important detail of the LifeStraw is its ability to reduce water turbidity (muddiness) by filtering particulate matter larger than 0.2 microns and the removal of virtually all bacteria (99.9999 percent) and protozoan parasites (99.9 percent) that contaminate water, including giardia. Finally, one LifeStraw provides a minimum of 1,000 liters (264 gallons) of purified, clean drinking water.

<http://www.inquisitr.com/1787489/simple-invention-makes-filthiest-water-in-world-drinkable-third-world-countries/>

5. Mobile smart flower pot

What if instead of moving your plants during the day or depending on the season, they moved themselves to find the optimal position in your flat? That situation could soon be a reality, thanks to a new prototype designed and built by Xiaolong Mu. Mu's "Chasing Sunlight" pots have light sensors and motorized wheels that enable plants to move on their own to reach optimal lighting.

<http://inhabitat.com/chasing-sunlight-is-a-smart-flower-pot-that-rolls-to-find-best-light-conditions/>

6. Plastic Recycling process WITHOUT water and 50% cost

"In current plastic recycling processes, water is used as a coolant. But Adame's method eliminates the need for water by avoiding severe temperature changes altogether. This is achieved by simply skipping the step of the recycling process where plastic is ground and dehydrated by being heated and then cooled with water. Instead, Adame's method goes directly to forming the recycled beads of plastic. This means the process uses about half as much energy and also takes up less square footage. The waterless method results in recycled plastic pellets that are a slightly better quality than other methods, which makes the process quite profitable.

<http://inhabitat.com/new-plastic-recycling-method-saves-tons-of-water-and-money/>

7. Medical Device for Dry Eyes

Dry eye, a painful condition where a person's lacrimal glands don't create enough tears to lubricate the surface of the eye. "The device increases tear volume by delivering micro-electrical pulses to the lacrimal gland. It's inserted into the mucus lining of the sinus cavity or under the skin beneath the eyebrow. Tear delivery rates can be adjusted manually with a wireless controller.

<http://scopeblog.stanford.edu/2015/01/26/a-medical-invention-that-brings-tears-to-your-eyes/>

Analysis of Inventions – What and How!

We focus on finding out the key function that an invention delivers. The function may be in abstract terms and may indicate a generic class of functions. Some inventions may not deliver specific function but change an attribute or set of attributes of the existing system. This answers the question “what” the invention does? Second important question is “how” it does what it does? The method, scientific or technological principle that it uses is the key. How a function is delivered, in what way or how a system parameter or attribute is changed is the method or way of doing the invention. Following table provides a summary of function/attribute and how it is done in the set of inventions.

In this month's lot, three inventions are related to the function “Cleaning”. Two are related to the attribute – “Flexibility/Adaptability” and one each is related to “efficiency” and “repair”. One can see that to perform the same function – say - cleaning – inventors use different methods – in our list – ultrasound waves, lotus effect and micro filtration. *One can create new inventions by just applying a different method to achieve a given function. For example, can clothes be so designed that they utilize lotus effect and can be washed without water?*

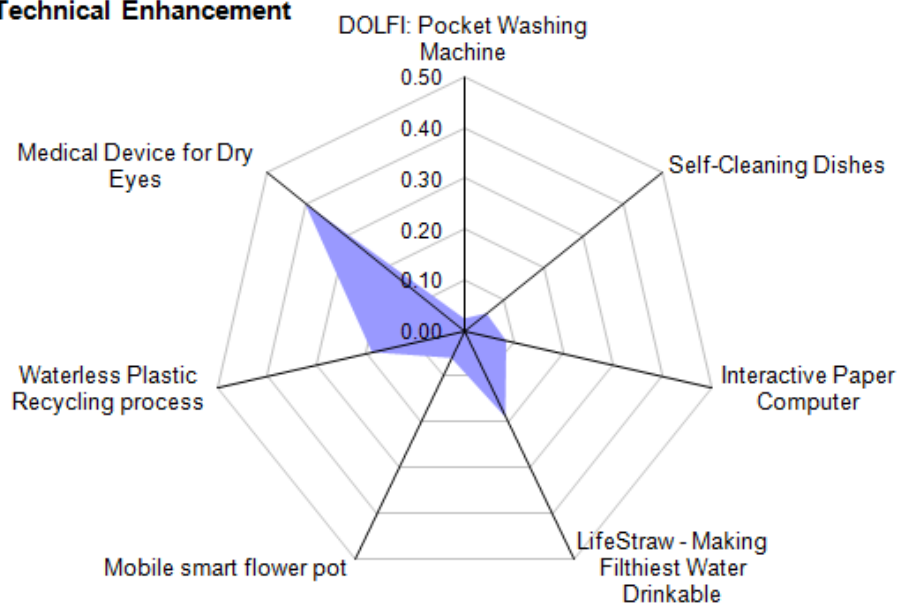
S.No.	Title	Function/Attribute	Method
1	DOLFI: Pocket Washing Machine	Cleaning	Ultrasound waves
2	Self-Cleaning Dishes	Cleaning	Mimicing Lotus Effect
3	Interactive Paper Computer	Flexible Displays	Thin Films
4	LifeStraw - Making Filthiest Water Drinkable	Cleaning	hollow fibre microfiltration technology
5	Mobile smart flower pot (that chases sunlight throughout the day)	Adaptability	Self-adaptability by Embedding sensing, mobility and processing
6	Plastic Recycling process WITHOUT water and 50% cost	Efficiency	Trimming
7	Medical Device for Dry Eyes	Repair	Auto-repair by pulsing with targeted micro-electrical waves

Strategic Invention Map – using the Analytic Hierarchy Process (AHP)

In our work we use the AHP extensively. It's a well-established multi-criteria decision-making (MCDM) methodology to convert expert opinions into quantitative rankings [1]. We evaluated the 7 inventions on **relative** Novelty, Value, and Feasibility.

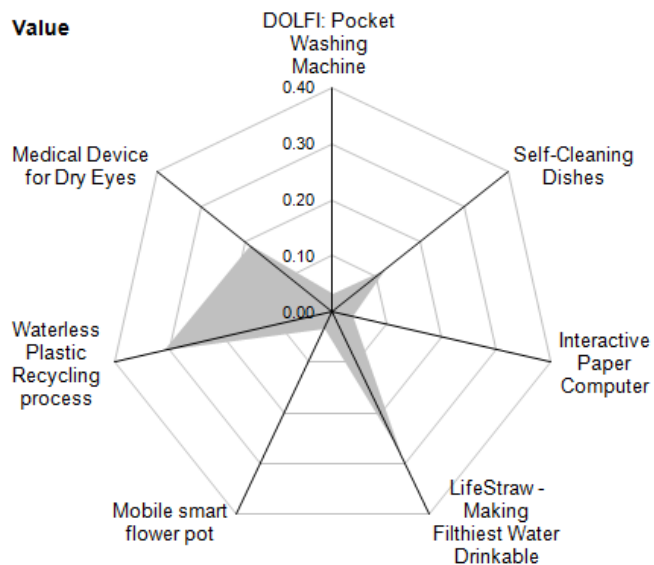
Relative Novelty of the Inventions On the pairwise qualitative comparisons AHP process found the relative novelty of the inventions. The following chart indicates the relative novelty of the inventions.

Novelty/Technical Enhancement



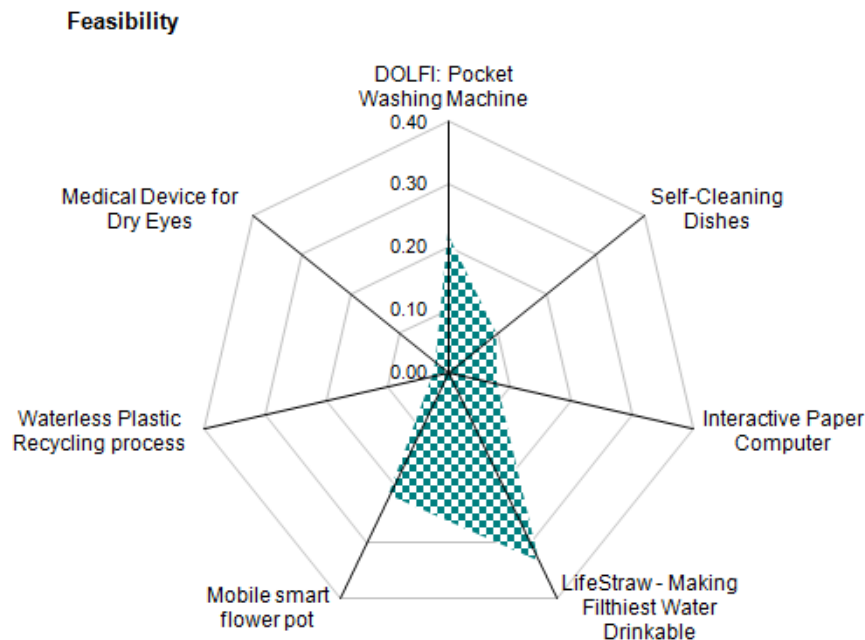
The **Medical Device for Dry-Eyes** is considered the most novel in comparison to others followed by **Waterless Plastic Recycling process**. At the 3rd place is the **Life-straw for making filthiest water drinkable**.

Relative Value of the Inventions The overall relative value of the inventions is depicted in the chart below.



One can see that **Waterless Plastic recycling process** and **LifeStraw for making filthiest water drinkable** are considered to be of highest relative value followed by Medical **Device for Dry Eyes**.

Relative Feasibility of the Inventions Relative feasibility rankings using AHP comes out to be as shown in the chart below.



LifeStraw for making Filthiest Water Drinkable is considered most feasible invention of the month. It is followed by **Pocket washing machine** and **Mobile smart flower pot**.

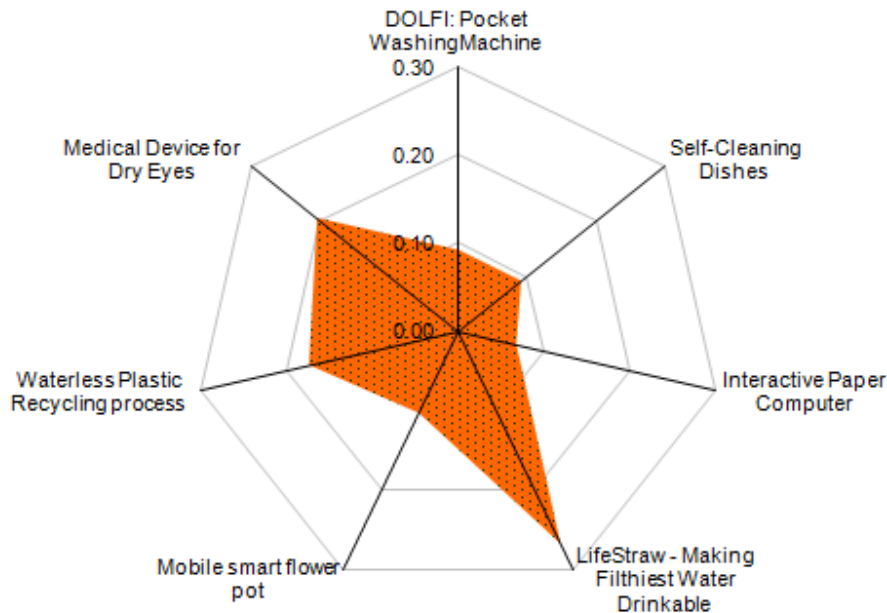
Top Level Weights	0.333	0.333	0.333		
7 Inventions	Novelty	Value/Effectiveness	FEASIBILITY Relative		Final Ratings
DOLFI: Pocket Washing Machine	0.025	0.032	0.220		0.092
Self-Cleaning Dishes	0.056	0.119	0.099		0.091
Interactive Paper Computer	0.085	0.037	0.080		0.067
LifeStraw - Making Filthiest Water Drinkable	0.187	0.280	0.335		0.267
Mobile smart flower pot	0.059	0.034	0.217		0.103
Waterless Plastic Recycling process	0.187	0.310	0.025		0.174
Medical Device for Dry Eyes	0.402	0.189	0.025		0.205

One can see the ratings change as per the criteria chosen. A summary of quantitative rankings is given below.

The multi-criteria decision-making requires that criteria should also be rated in terms of relative importance. In this case, we give equal weights or importance to all the three criteria. A combined ranking is obtained by weighted sum of each invention on

each criterion. The chart below plots all the inventions on the weighted ratings.

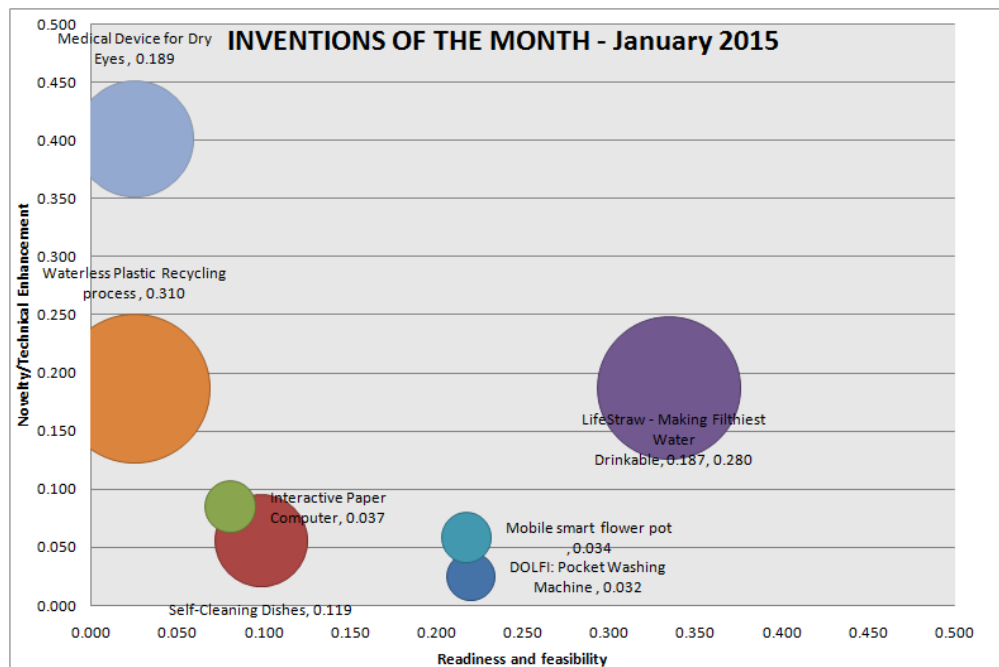
INVENTION OF THE MONTH



Clearly, on the combined ratings **LifeStraw for making filthiest water drinkable** is the top Invention of the Month on the combined criteria of Novelty, value and Feasibility. It is followed closely by **Waterless Plastic Recycling Process** and **Medical Device for Dry Eyes**.

Strategic Invention Map

The three criteria of Novelty (on the y axis), Feasibility (on the x-axis) and Value (the bubble size) indicated of the following Strategic Invention Map is a guide





for evaluation and ranking of these inventions. Although we have found **LifeStraw for making filthiest water drinkable** to be the best invention of the month, the Strategic Invention Map, provides clear picture of all the inventions and can be used to map and create guidance for any set of strategic initiatives.

Invention of the Month is

LifeStraw for making filthiest water drinkable is the top Invention of the Month on the combined criteria of Novelty, Value and Feasibility. **Medical Device for Dry Eyes** comes out to be the most Novel invention of the month.

*Navneet Bhushan (Navneet) is the founder-director of Crafitti Consulting. He is the leading expert on innovation and principal author of **Strategic Decision Making- Applying the Analytic Hierarchy Process**, Springer-Verlag, UK, published as part of the **Decision Engineering Series** and featured at the Harvard Business School working knowledge for business leaders. Navneet has trained thousands of executives, scientists, and engineers, at multi-national, government, and start-ups, across the world. He consults on strategy, innovation and intellectual property. He can be contacted at navneet.bhushan@crafitti.com.*

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