The Toilet

Introducing the toilet

Tired of pooing on the floor? Wish there was a way to somehow have your poop shuttled through a series of tubes halfway across your city? Introducing the toilet, the perfect tool for attending to all your less desirable bodily functions.

The toilet has played an important role in the development of large, dense, modern style cities. Without the toilet human waste would be a serious health issue. To solve this issue, humans have managed to create a device designed and designated for handling the capture and removal of this harmful waste. While the toilet is arguably less important than the series of pipes actually handling the movement of the waste, the toilet itself is still plays an important role, acting as an interface between the human and the network of pipes. The toilet handles it role so well, people often take toilets existence for granted, despite using them nearly daily. Up next is a quick history of the toilet, followed by why toilets are important.

The History of Toilets

Toilets have come quite a way. Starting as a simple hole that drops into a stream, up to the bidet equipped Japanese super toilets, toilets are as much a part of the modern human experience, as the bodily functions that make toilets necessary.

"Who's that then?"

"I don't know. Must be a king."

"Why?"

"He hasn't got shit all over him."

\- *Monty Python, The Quest for the Holy Grail* -

It's important to know the clear definition of a toilet, when talking of it's history. For example, a hole in the ground is not a toilet, as a toilet requires a water based mechanism to remove the collected waste.

"[a toilet is] a fixed receptacle into which a person may urinate or defecate, typically consisting of a large bowl connected to a system for flushing the waste into a sewer or septic tank." - dictionary.com

The First of the Toilets

The first toilets were created nearly 5000 years ago, and commonly consisted of a vertical chute that lead to cesspits or street drains. Houses in Scotland around this time period had houses with drains running beneath them to remove the waste. These toilets were made out of hardened clay, and would look like a more primitive version of the image on the left.

Keep in mind, that if it doesn't use water to remove the waste, according to the definition above, it isn't actually a toilet.

Closer to 2000 years ago, the Romans had toilets at public bathhouses. Theses were the first wide spread sitting toilets, and consisted of holes in a stone surface. These toilets did not have any dividers. To remove waste, a small stream of used bath water ran below the toilets.

To the right is an actual picture of Roman public toilets.

The Current State of Toilets

The standard modern version of the toilet. A tank of water on the back that quickly drains into the bowl to flush waste into the attached piping below.

- Flushing toilet invented by John Harington, 1596
- Joseph Bramah patented first practical water closet in 1778

A few of the most innovative ideas that still exist in todays modern toilets were patented by Thomas Crapper. Thomas Crappers most notable patent is the floater that turns off the water supply, which allows the toilet to automatically refill, without flooding your house, or requiring human intervention.

State of the Art Toilets

Current state of the art toilets are essentially the standard toilet, with extra bells and whistles. These toilets are far more common over in Japan. State of the art toilets may include features such as:

- Heated seats
- Bidets
- Air dryers
- Manual control over amount of water flushed
- Music controls
- Lighting controls
- Toilet seat, and lid cover controls
- Stool analysis

While all of these features are probably nice to have, none of them change the core function of the toilet, or how the toilet achieves this core functionality. In other words, all toilets simply move human waste into a piping system, none of them will turn your poo into gold.

Now that it has been shown how toilets developed, and where toilets currently are, why toilets are important will be discussed.

Why Toilets Are Important

While toilets and other modern forms of sanitization are entirely taken for granted in wealthy countries (see intro paragraph), there are a lot of poor counties in the world that do not enjoy such benefits. Improper public sanitization, especially when related to poop, is harmful enough to warrant the existence of an organization dedicated to improving toilets and related infrastructure in developing nations. According to World Toilet Organization one-third of the world does not have access to improved sanitation.

"Diarrhoeal diseases – a direct consequence of poor sanitation – kill more children every year than AIDS, malaria and measles combined." – World Toilet Organization

According to the world health organization, diarrhoeal diseases kill more than 760,000 children under five each year. Averaged out, that results in roughly 87 young children dying every hour. Three quarters of a million children will die each year, because they don't have access to a bathroom.

"A lack of clean and safe toilets at schools leads to higher dropout among girls once they reach puberty." – World Toilet Organization

Disease isn't the only reason toilets are important. A lack of toilets causes another serious issue; access to toilets can seriously effect the economic prosperity of women in developing nations. When trying to lift a nation out of poverty, it is important to try to empower the work force with the resources and tools needed to get going, and education to keep going. With women making up roughly half any randomly selected workforce, providing toilets could lead to a massive increase in the education and effectiveness of a workforce in a developing country.

The Usability of the Toilet

The toilet is a very easy to use object. Consisting of two main task areas, first a sitting task, and second a button pressing task. There are few tasks that are less difficult than either sitting, or pressing a button.

In terms of affordability, it is hard to say for sure where the toilet rates. It seems safe to assume the toilet should be considered affordable, as the parts are very simple to use. If one had never seen a toilet before, they may flip the lids up and down, touch the button and see it flush, and try sitting on it. Once these elements are discovered, one would think it would not be a far jump to actually using it. It would be interesting to test this, by introducing toilets to those in developing nations, and see how they get along trying to use it or perhaps even understanding it at all.

According to the 8 characteristics of a successful user interface by usabilitypost.com, it is easy to see the toilet scoring high on all 8 characteristics of a successful user interface. These usability characteristics will now be gone though.

1. **Clearness**: It is clear what a toilet does after basic investigation: it takes whatever is in the bowl, and forces it using water down below.
2. **Conciseness**: The toilet is a concise tool, it does one job, and does it well, with a single button, the standard toilet could be a contender for the best designed UI in human history.

3. **Familiarity**: The toilet is unbelievably familiar, with people being introduced to toilets very early in life, and the toilet not having changed for hundreds of years, the toilet is among the most familiar of human appliances.
4. **Responsiveness**: The toilet is a very responsive apparatus, relying on very simple and reliable mechanisms to achieve its functional goals, the toilet responds to user input at the speed of physics, and does not suffer from system hangs, or bluescreens.
5. **Consistency**: Until fairly recently the toilet has been a very consistently designed device. Consisting of a tank, a bowl, a seat, and a lever to flush with. Even most Japanese super toilets have a physical button for flushing.
6. As for **attractiveness**, the toilet was a leader in the simple appearance trend, changing to simple white designs years before the software trend started. Whether or not a toilet is found to be attractive is up to the on looker, but to me it would seem hard to call a toilet outright ugly.

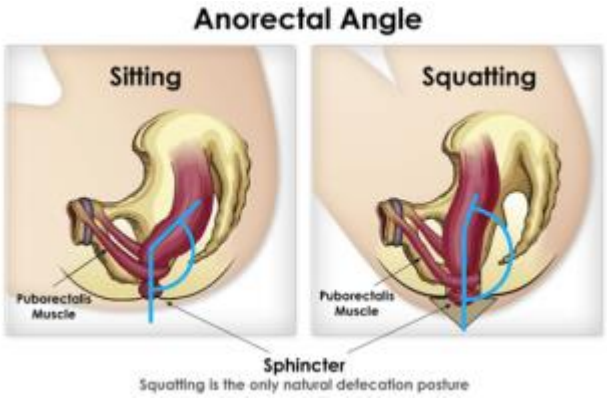
> *"What you really really need to do to make an interface efficient is to figure out what exactly the user is trying to achieve, and then let them do exactly that without any fuss."* – *usabilitypost.com*

7. **Efficiency**: The toilet knows exactly what the user is trying to do, and let's them do it without any fuss.
8. **Forgiving**: Finally, the toilet is fairly forgiving, automatically refilling the tank without any issue, to give the user a second attempt at flushing if they so need to. Although the toilet can suffer from being clogged, and / or overflowing from the bowl. The fix to a clog is to brute force it into submission, something many people probably wish they could do to their computer when it stops working.

The toilet has now been compared against the 8 usability characteristics set out by usabilitypost.com, and it was shown to do very well in each characteristic.

Improving the Toilet

While the modern toilet is very easy to use, and does well in many characteristics that are used to define successful user interfaces, the toilet is not the best design to use in terms of intestinal health.

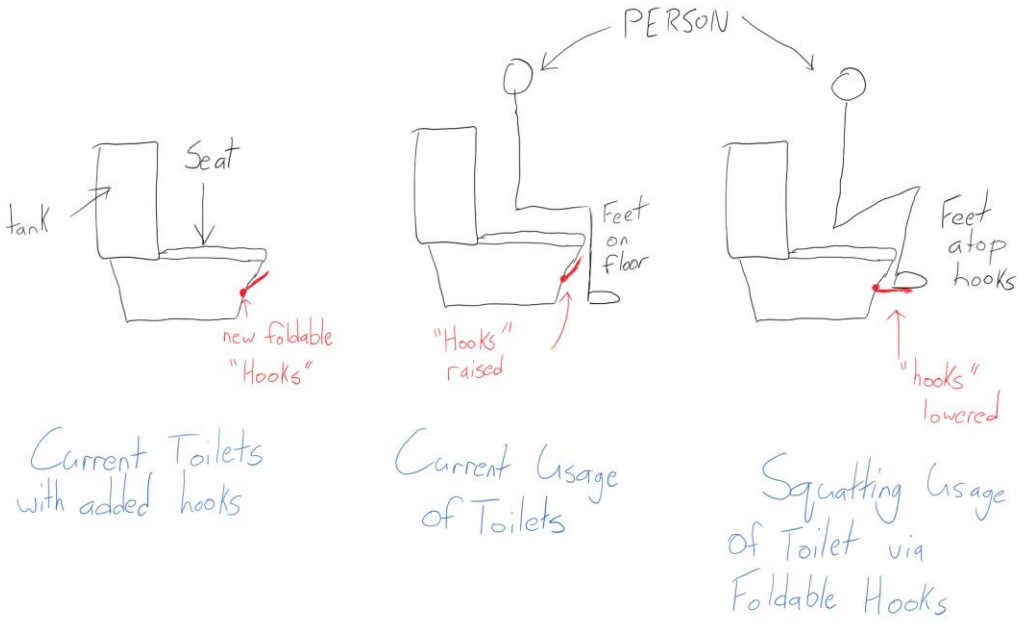


To the left: illustrating the problem with modern American toilets.

The unnatural curve in the intestine contributes to many serious conditions of the intestine, including constipation, hemorrhoids, and colon disease.

The first thing that should be done to improve North American toilets, is to allow users to both use toilets as they do now, and to give them the option to use the toilet in a squat positon, perhaps by

adding little foldable hooks on the side of the toilet that would allow the user to place their feet in an elevated manner from the floor.



This design would allow people to continue to use toilets as they always have, while giving the option on mainstream scale for users to make the choice to do the healthier squatting option. This seems like a much better option, then creating harsh segregation between status quo, and the envisioned future (looking at the “brave” designers at Apple).

It is entirely a bad idea to try to transition an entire culture from one style of toilet to another without any kind of transitioning. The drawn image above attempts to tackle this issue by allowing users to keep using the product as though nothing had changed, while also letting users use the new functionality by choice. If the new style of usage gains mainstream approval, the transitioning can continue from there with iterative improvements, if not then the option can always remain without impacting current usage.

Another issue to be solved with toilets is to reduce water usage. However, since water efficiency of toilets is already a trend in progress, time won’t be spent discussing this.

Outside of water usage and colon positioning, the plain old toilet performs it functions pretty damn well. Acting as an interface between humans and a network of pipes desired to handle human waste, the toilet does its job so well, most people don’t often think about their existence, despite the fact they probably on commonly use them at least once a day. Thanks for reading!