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Each year brings new technology, whether they are “toys” or “tools”, as reincarnations or completely new inventions.

Operating Systems: This year saw no dramatic shifts in the market share dispersment of devices and operating systems. The triumvirate still holds: **Apple** dominates smart phones, **Linux** dominates tablets and **Microsoft** still holds its domination over laptops and desktop computers. However, traditional Windows users are NOT migrating to the new Surface Tablet, nor has Windows 8.1 been well received. As a matter of fact approximately half of the Windows users are still using Windows XP. And many are considering some form of Linux instead of sticking with a Microsoft OS. Perhaps Microsoft is trying to distance itself from Windows 8 by calling its latest OS in the works Windows 10.

Browsers: The king of browsers, **Firefox**, dramatically dropped to third place behind **Google Chrome**. This is probably due in part to Chrome’s ability to run on more OS’s than any other browser (Windows XP, 7, 8, 8.1, Mac and all Linux distros including Android) and in large part to the lack of support for Windows XP, which ended very shortly after the OS support ended. As a quick aside, if you are one of the many XP users you need to use a browser that is continuing to support your OS. So **IE8** (the highest version that will run) is also not a viable option as support ended long before support for XP ended. Try **Opera**, **Maxthon** or **Google Chrome**. Also check that your security software is also being supported.

Smart Technology: Smart watches have been a big flop, primarily because the screens are too small. Additionally, only the Martian Notifier allows you to customize the alert (email vs. text) as it comes in. But Apple is still looking into it.

One of the more useful new Smart toys is the **GOJI Smart Lock**. Once installed, this device uses Bluetooth connectivity to send a signal via a free app to remotely lock doors, cabinets ... and automatically open the lock when your Smartphone is near. (You can also set it up to greet you by name!) It also has a built-in camera that will take pictures of everyone who approaches your door and transmit those images to your Smartphone via you home network’s Wi-Fi. Should you lose your Smartphone, call GOJI’s 24 hour call center (or visit their website), cancel that phone and transfer access to another phone, effective immediately.

There are many free apps that will help you get in better shape, and the new **Voyce Band** helps you track your dog’s activities. This dog collar tracks everything your pet does during the day including meal content and pertinent health information. Of course

you can also look into the **Scanadu** for yourself. This small device can track temperature and certain blood levels. Additionally, there is the **Kolibree Smart Toothbrush** which tracks brushing information (length of time, habits...), but also teaches how to brush properly. This information can be shared with others and posted to social media. Hmm, I'd think about that last one!

Medical Technology: Digital Dental X-Rays are recent advance. They use radiography, where a small sensor is used instead of photographic film. Dentists get the results immediately and can view them on as large a screen as they like, as well as dropping the patient's exposure to radiation by 90%. But at \$5,995 for an IRIS Intraoral Digital Camera, don't expect most dentists to dash to make the switch.

An amazing advance is a new twist on Electroknives, which have been around since the 1920s. Going by various names, the **Onkoknife**, **iKnife**, or **Intelligent Scalpel**, developed by **Zoltan Takats, Ph.D.** (a Hungarian research chemist associated with Semmelweis University in Budapest) burns through tissue with an electrical charge, just like its predecessors. However the iKnife extracts information from the vapor given off to detect cancer cells. It is being used very successfully, but is limited to cancer detection in a surgical environment.

Affordable 3D printing has given rise to **3d Bio printers**. Initiated by a team of doctors, researchers, technicians, and students at the Cardiovascular Innovation Institute (CII) on Muhammad Ali Boulevard in Louisville, Kentucky, they are striving to print a human heart. The object is to use undifferentiated stem cells and use cells from the individual to receive the replacement tissue/ organ. At present, the equipment available is too slow and the printhead runs on a three-axis robot that doesn't handle curves very well. However, **Invetech** partnered with **Organovo** (located in California) to create the world's first commercial 3D Bio printer. Organovo is dedicated to continuing to develop this technology.

But the piece of medical technology that wowed everyone at a recent tech show was the **Brainwriter**. Developed by **NotImpossible Labs**, it is a next-generation device that reads basic brain waves (EEG) to engage and disengage a computer mouse, allowing the user to draw using only their thoughts, or "blink-to-think". It allows fully paralyzed individuals to continue to write and draw by tracking eye movements. This approximately \$400 make-it-yourself open source device is made from a headband, Olimex sensors, a shielding board, an OpenBCI board (which is an EEG device) and an eye-tracking device (i.e. SYMeyes, Tobii or EyeTribe). This was the next step up from the **Eyewriter** – another make-it-yourself device that uses low-cost eye-tracking glasses (\$50-\$100) and open-source software to allow people suffering from any kind of neuromuscular syndrome to write and draw by tracking their eye movement and translating it to lines on a screen.

Entertainment: **TVs** have some interesting innovations with UHD and curved screens. Some of the curved screen TVs allow can be returned to a flat screen with a push of a button. But at \$17,000 for an LG 84inch UHD, don't expect to see one in every home.

Disney's quest to be the best has caused them to develop amazing new software, **Hyperion**, for their newest movie, **BIG Hero 6**, which allows light to be used in a completely new way for animation. After 200 million computing hours to create, it has the ability to deal with acutely complex calculations in order to account for how light bounces from its source then across other objects before reaching the camera. It also required the use of a 55,000-core supercomputer to complete its task.