

# 3D PRINTING

**Source:** Manorama yearbook 2015,

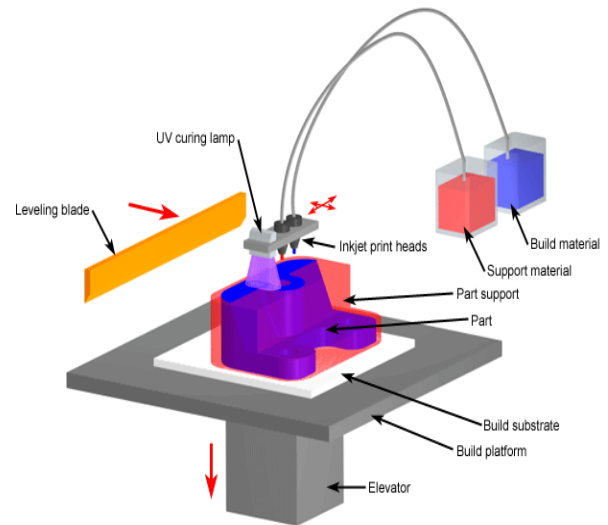
www.3dprinting.com, www.forbes.com,

**Date Time :** 7July 2015 at 6:43pm

**Reporter:** Rupal Agrawal

**Class :** FYBSc(IT)

**Roll no.:** A001



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## WHAT IS 3D PRINTING AND HOW IT'S DONE

3D printing or additive manufacturing is a process of making **three dimensional solid objects** from a digital file. In an additive process an object is created by laying down successive layers of material until the entire object is created. Each of these layers can be seen as a thinly sliced horizontal cross-section of the eventual object.

It all starts with making a virtual design of the object you want to create. This virtual design is made in a CAD (**Computer Aided Design**) file using a 3D modeling program (for the creation of a totally new object) or with the use of a 3D scanner (to copy an existing object). A 3D scanner makes a 3D digital copy of an object. To prepare a digital file for printing, the 3D modeling software

“slices” the final model into hundreds or thousands of horizontal layers. When the sliced file is uploaded in a 3D printer, the object can be created layer by layer. The 3D printer reads every slice (or 2D image) and creates the object, blending each layer resulting in the 3D object.

Not all 3D printers use the same technology. Some methods use melting or softening material to produce the layers. **Selective laser sintering (SLS)** and **fused deposition modeling (FDM)** are the most common technologies using this way of printing.

Since 2010, the American Society for Testing and Materials (ASTM) group developed a set of standards that classify the Additive Manufacturing processes into 7 categories. These are: Vat Photo polymerisation, Material Jetting, Binder

Jetting, Material Extrusion, Powder Bed Fusion, Sheet lamination and Directed energy deposition.

## APPLICATIONS

Due to availability of a wide range of materials to print and many methods to do so, the application of this technique is broad. The following applications are noteworthy:

1. **Food Products:** A number of culinary products can be manufactured according to need with the help of a 3D printer, especially by extrusion process. It would be easy to produce chocolates with it but with culturing proper types of cells it is possible to produce even non-veg food. With the current astounding prices it may not seem an affordable for food but in near future it may find use for people staying in space or someone far from home.

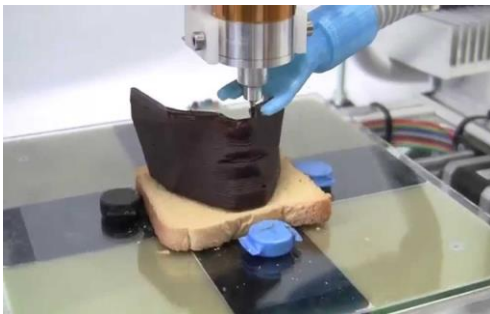


Image: 3D printing of a chocolate sculpture

2. **Aircraft, Engines and Automobiles:** Aircrafts are made durable with multiple smaller parts which are welded or assembled which reduces its durability and strength.

3D printing technology can turn very important in the aircraft and automobile sector for printing durable parts which would be cheaper, quicker and safer alternative to the current products. Even printed cars are nearing production soon, which would be an aesthetic and cheaper alternative.



Image: 3d geometric sculpture

3. **Biomedical:** The use of 3D printing in this sector is vast and highly interesting. Suppose if a person has lost a part of his bone in an accident, currently it would be filled with ceramic particles if the part is not weight bearing. 3D Printing can be applied easily to such situations. Firstly a CT scan of the affected part would be taken which would then be fed into a CAD program. This then would be used to print the exact

bone part with required dimensions. 3D printing is already being used to print dental implants, hearing aids, and precise replica of human parts. Newer technology will allow printing them in micrometer size and printing organs on demand. However a challenge to this sector would be keeping the cells alive and free of contamination.



Image: 3D printed nose and ear



Image: 3D printed prosthetic arm

4. **Construction:** Building houses with intricate complex design will be easier with the help of 3D printing technology. This could be done by using concrete before its solidification starts to build the required design. In future, an

entire house could be built within a week as per the need.

## CURRENT STATUS IN INDIA AND ITS FUTURE

In India this topic is already chosen as a hot topic of research in many of the IITs. IIT Hyderabad has uniquely started a course program for all engineering undergraduates to get training and exposure in additive manufacturing in addition to the traditional subtractive manufacturing methods. Indian manufacturers have started making very low cost 3D printers which can be affordable to a broad category of people. Printers are also available on sites like amazon.com, while some sites sell customizable 3d printed products.

The advantages of 3D printing technology are multifold. It largely reduces the wastage of material which happens up to 90% of materials in traditional techniques. As the product is the exact replica of the CAD file, there is no need of any human to produce the final product. Also it can create interlocking parts; complex geometric shapes etc. with ease. As only the printer and the material are required, customers need not wait for the shipment of the product, rather they can print it in the local market itself. Needless to say, this might bring a new era in manufacturing any kind of products and soon the made in china tag could become a collectable!

# COMPUTER ANIMATION

**Name:** Jigar Anaghan

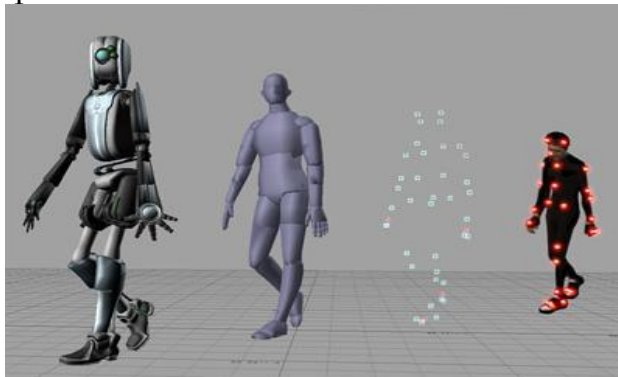
**Roll no :** A003

**Class :** FYBSc(IT)

It will not be an exaggeration to say that animation can bring the duller of the features to life. It has the magic of injecting energy and emotions into the most seemingly inanimate objects. Over the years the advancement of technology has made animation, a very attractive and much sought after component of multimedia.

## **What is Animation?**

'To animate' literally means to give life to. Animating is moving something that cannot move on its own. Animation adds to graphics the dimensions of time, which tremendously increase the potential of transmitting the desired information. In order to animate something the animator has to be able to specify directly or indirectly how the 'thing' has to move through time and space



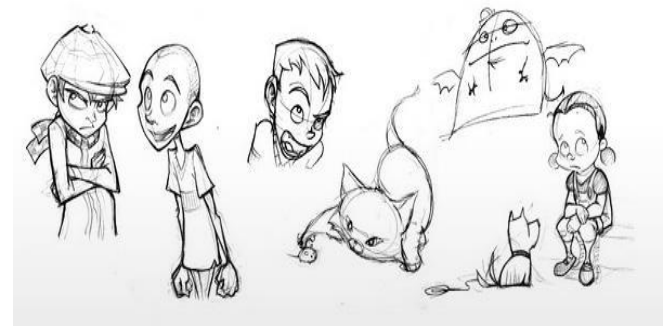
## **Traditional Methods:**

As is evident from the history, animators have used and invented a variety of different animation techniques.

Traditionally most of the animation was done by hand. All the frames in an animation had to be drawn by hand. Since each second of animation requires 24 frames (film), the amount of work required to create even the shortest of movies, can be tremendous.

## **Key Frames**

In this technique a storyboard is laid out and then the artists draw the major frames of the animation. These major frames are in which a lot of changes take place. They are the key points of animation. Later a bunch of artists draw in the frames in between. This technique is, of course, very time and effort intensive.



## **Cell Animation:**

In this technique each character is drawn on a separate piece of opaque paper. Then, at the time of shooting animation the different characters are overlaid on top of the background in each frame. This is relatively a less tedious process, as the artists do not have to draw in entire frames but just the parts that need to change such as individual character.

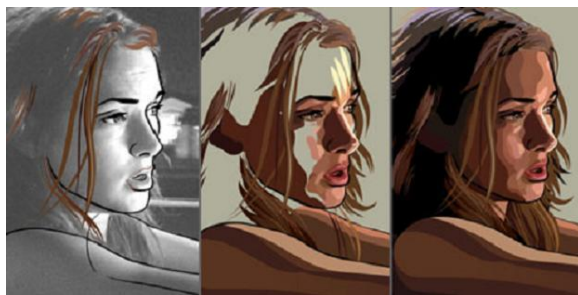
## **Rota-scoping:**

Rota-scoping is a technique where images are copied from a moving video into an animation. The animator draws the motion and shape of the object by referring to the video as opposed to imagining in his head. With the help of the rota- scoping one can

animate some complex scenes that would be hard to visualize otherwise.

The

disadvantage is that one will have to hunt for the exact video that one



wants to animate.

### Computer Animation

With time the technique of animation has become more and more computer - assisted and computer- generated. All of such techniques require a trade-off between the level of control that the animator has over the finer details of the motion and the amount of work that the computer does on its own. Broadly, the computer animation falls into three basic categories: keyframing, motion capture, and simulation

#### Keyframing

The significance of the term "Keyframing" can be traced back to traditional hand animation technique. Keyframing requires that the animator specify critical or key positions for the objects. The computer then automatically fills in the missing frames by smoothly interpolating between those positions. The characters for a movie called Toy

Story made in 1995 were designed through key frame animation. It's believed that each character had as many as 700 controls. Keyframing requires that the animator has a well thought out plan of how the moving objects are going to behave over time as well as the talent to express that information through keyframed information. The continued popularity of keyframing is a function of the degree of control that it allows the animator to exercise over the subtle details of the motion.

#### Motion Capture

Another technique is Motion Capture, in which magnetic or vision-based sensors record the actions of a human or animal object in three dimensions. A computer then uses these data to animate the object. This technology has enabled a number of famous athletes to supply the actions for characters in sports video games. Motion capture is pretty popular with the animators mainly because some of the commonplace human actions can be captured with relative ease. However, there can be serious discrepancies between the shapes or dimensions of the subject and the graphical character and this may lead to problems of exact execution.



#### Simulation:

Unlike key framing and motion picture, simulation uses the laws of physics to

generate motion of figures and other objects. Virtual humans are usually represented as a collection of rigid body parts. These models though physically plausible are only an approximation of the human body. With more research and complex models the simulations are becoming increasingly life like. Simulations can be easily used to produce slightly different sequences while maintaining physical realism while in other animations like key framing or motion capture a mere speeding up or slowing down the playback can spoil the naturalness of motion. Secondly real-time simulations allow a higher degree of interactivity where the real person can maneuver the actions of the simulated character. In contrast the applications based on keyframing and motion select and modify motions form a precomputed library of motions. One drawback that simulation suffers from is the expertise and time required to handcraft the appropriate controls systems.

The SGI platform is one of the most widely used platforms for quality computer animation productions. SGI computers operate using the wide spread UNIX system.

Produced by Silicon Graphics these computers are extremely fast and produce excellent results. They come in a variety of types, ranging from the general purpose Indy to high power Indigo Extreme that is used for animations. Onyx is another type, which is suited to the complex calculations involved in rendering. Some of the software like Wavefront, Alias, and SoftImage are ran on SGI's.

### **PC's**

PC's are very versatile machines combining flexibility and power. PC's have proven to be very useful for small companies and businesses as platforms to do computer animation. Applications such as 3DStudio and Animator Studio are used on PC's to make animations.

### **Macintosh**

Mac's were originally designed for graphic and desktop publishing and hence are pretty useful platforms for producing computer graphics and animation software. Some of these applications that work well on Mac's are Adobe Products like; Photoshop and Premiere and Strata with Strata Studio Pro

# ANDROID M: 5 THINGS WE DID LIKE TO SEE

## FROM GOOGLE

SOURCE: [WWW.TECHRADAR.COM](http://WWW.TECHRADAR.COM)

**Reporter:** Pratit Anaghan

**Class :** FYBSc(IT)

**Roll no.:** A004



Google's Android Lollipop is just around the corner and we already know all about it. There are still improvements to be made. So here's our take on what Google Android M should offer.

### **1. Release date**

It's hard to have a definitive release date in mind for Android M, but history says we can probably expect to see it towards the end of September. The last three versions of the OS have been announced in September (Kit Kat) June (Jelly Bean) and October (Ice Cream Sandwich) respectively. Not to mention the June

Themes, scaling and different key positions could all be employed for a more personalised experience.

2014 reveal for Lollipop. Either way, we'll probably get a decent amount of lead time following the announcement as Google makes it available to developers first.

### **2. Better native keyboard**

It's been a long time since we've used the native Android keyboard because third-party options like SwiftKey are superior. Adding the option to set a third-party keyboard as default when setting up from scratch would be a useful shortcut.

While Google's keyboard gets the basics, like autocorrect and predictive texting right, there's more that can be added to improve the experience.

### 3. Ultra power saving mode as standard

Faster processing, higher resolution screens and better multitasking all take their toll on battery life. Manufacturers like Samsung and HTC build-in power saving modes to their flagship models, but it's a feature we'd like to see Google incorporate into native Android.

Historically, the OS has been very good at showing you exactly where your usage is going but we have yet to see a single mode that limits all non-essential functions and severs data in order to preserve power.

It's a relatively simple extra that could build on Android Lollipop's battery saving function that, Google says, will give you an additional 90 minutes of usage.



### 4. More tablet-centric apps

Compared to Apple's iPad selection, the quality of tablet-specific Android apps can be an issue - simply because of the

huge amount of Android differentiation that's out there.

While the big-name apps are written to scale proportionally to different tablets, there's still a discrepancy between smartphone and tablet output.



Part of the reason this can be addressed with a newer version of Android is that we'll have 64-bit chips as standard by the time Android M is ready to roll.

### 5. More home and car support

By the time Android M rolls around we won't just be using the OS to control our smartphones and tablets but our homes, cars and wearables as well.





Google has already pioneered the Open Automotive Alliance and signed up the likes of Audi, Ford, Honda and Volvo. It's highly likely you'll be using Android M to pick your GPS route and music for the road before you've even got into the car.

# THE SURPRISING GENIUS OF

## APPLE'S BEAT 1 RADIO

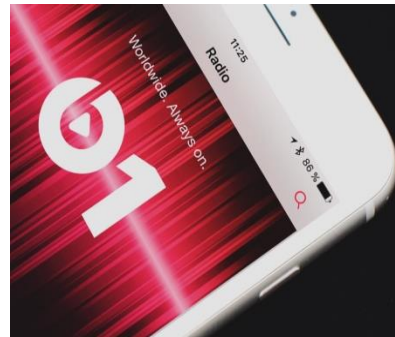
**Source:**Computerworld.com

**Date Time :** July6,2015,3:15am

**Reporter :**Manali Chavan

**Class:** FY.BSc.IT

**Roll No :** A005



When Apple announced it was creating an Internet radio station called Beats 1 to go along with its Apple Music service, I was dismissive.

It didn't make sense. There are already thousands of Internet radio stations broadcasting worldwide that have been around for years. The DJs Apple poached from the BBC and elsewhere have been streaming music on the Internet for years -- and Apple's fans barely noticed.

Apple's recent music rollout came in three parts: [Apple Music](#), which is a radio station.]

It's also by far the most brilliant. I'll tell you why later. But first, the facts.

Beats 1 showcases music industry big shots, starting with the DJs Apple has hired to headline the service: radio

streaming music service; [Connect](#), which is a kind of promotional social network for artists; and [Beats 1](#), which is an Internet radio station.

Of these three components, the least innovative, least unique and least technology-oriented is the Beats 1 . Beats 1 is free, of course. It's available to anyone running the desktop PC version of Apple's iTunes 12.2. It's also available to iOS users now and will become available to Android users later. The Apple Music app will be Apple's first Android app ever.

Weirdly, the station is ad-supported. The ads are short, public radio style "audio mentions" for "sponsors" rather than full-blown commercials.

personalities Zane Lowe (the BBC's best DJ), Ebro Darden (the top guy at New



York's Hot 97), and Julie Adenuga (who was at MTV and the BBC before joining the London underground radio station Rinse FM).

The station will feature major music personalities like Ellie Goulding, St. Vincent, Anna Lunoe, Jaden Smith, Travis Mills and Dr. Dre. It will also offer major celebrity interviews, starting with Eminem

Beats 1 is the only medium that offers an always-there global shared content experience. Apple has just the one radio station, and because it has deep pockets and a wide reach, it can do things no one else can do.

Beats 1 is flawed. With Apple's vast resources, it's almost bizarre that it's selling sponsorships and playing recorded reruns. A true home run would have been live, commercial-free programming 24/7.

But by giving the world a high-quality, global shared music experience, Apple gives itself enormous new relevance, credibility and power in the music industry -- possibly even more so than during the height of iTunes' relevance.

It can attract the world's best or most famous DJs. It can also attract the world's biggest musical artists. But more importantly, Beats 1 makes Apple the world's top musical king maker.

The power of Beats 1 won't be lost on the music executives Apple negotiates with for licensing deals.

In Beats 1, Apple also gives itself an enormous megaphone to promote Apple Music and other Apple products and services. For now, the DJs are mostly flogging Beats 1 itself between songs, with slogans like "Coming to you worldwide" and "Always on."



Interestingly, songs with explicit lyrics are censored, even though it's legal to play uncensored songs over the Internet. It's no doubt that Apple is doing that to make the service more palatable to a global and general audience.

## MICROSOFT 2016

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**CLASS:** FYBSc(IT)  
**ROLL NO.:** 06

Microsoft Office 2016 (also known as Office 16) is an upcoming version of Microsoft Office scheduled to be released in late 2015 or early 2016. The latest preview version was released at a

conference in Chicago, introduces many new improvements and features from its predecessor Microsoft Office 2016

Features include: built-in cloud access to create, open, edit, and save files in the cloud straight from the desktop, a new search tool available in Word, PowerPoint, and Excel named "Tell Me", co-authoring in real time with users connected to Office Online.

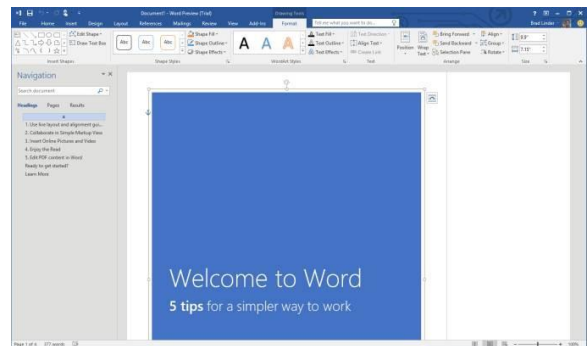
### **What is latest?**

Attachments can be a hassle to share among co-workers. Does everyone have the latest version? Did a colleague update a document with added content? Could the attachment be infected? Microsoft is trying to solve these problems by gently pushing users to be more cloud-centric.

In Outlook 2016, Microsoft now gives you a subtle nudge when you're adding an email attachment. Now the drop-down "add attachment" menu item asks you if you want to add a file, but also if you want to share a link to a file stored on your SharePoint, OneDrive or OneDrive for Business account.

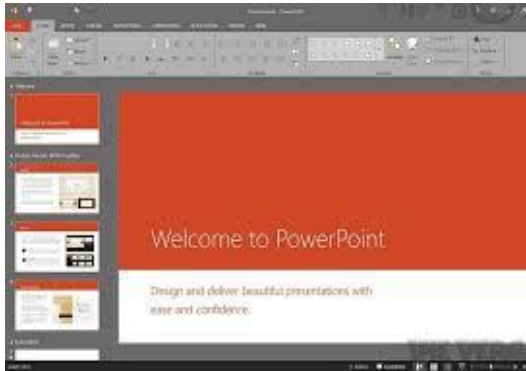
**Word for Mac**—Word's powerful writing and reviewing tools make it easy to create great-looking documents. The new Design tab lets you easily apply designer-quality layouts, colors and fonts throughout

your document. You can work on the same document simultaneously with your teammates and use threaded comments to have a conversation right next to the corresponding text.

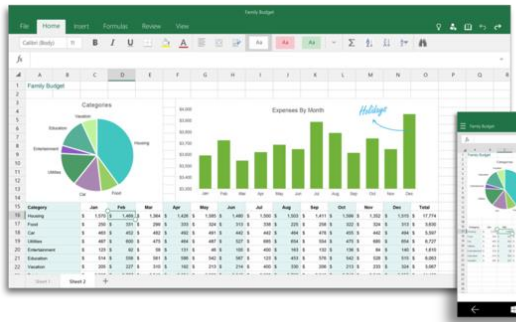


**PowerPoint for Mac**—PowerPoint's improved Presenter View gives you full control when you present by showing you the current slide, next slide, speaker notes and a timer on your Mac screen, while the audience only sees your presentation on the big screen. The new animation pane helps you design and fine-tune animations, and the latest set of

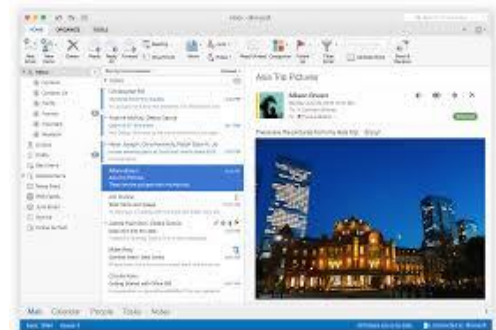
slide transitions add polish to your presentations.



**Excel for Mac** – The new Excel for Mac helps you visualize your information by recommending charts best suited for your data with chart previews. Familiar keyboard shortcuts, autocomplete and an improved formula builder save you time when creating spreadsheets or entering data. For deeper analysis, new PivotTable Slicers help you filter large volumes of data and discover patterns.



**Outlook for Mac** – Managing your email, calendar, contacts and tasks has never been easier. The new Outlook for Mac has push mail support so your inbox is always up-to-date. The improved conversation view automatically organizes your inbox around threaded conversations, so you won't have to hunt for related messages. And the new message preview shows you the first sentence of an email just below the subject line so you can quickly decide if you want to read it now or come back later.



**-Edited by Asiya Shaik**