COMPUTER INFO–GALLERY

VOLUME -9

(2020-2021)

Beat the Jargon

Students' Assignments as

IT Encyclopedia
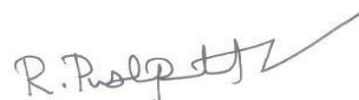
PREFACE

This book is intended to make the New-Comers (Students) of the Department of Computer Science (UG), who does not have the ideas regarding the basics of the Computer and its terminologies. It can also help the students from computer backdrop, to make a review regarding the IT terminologies and concepts. Already 8 Volumes has been launched during 2012-2020.

The thought of publishing this book arises as a sparkle to make the Student's Assignments, in an organized manner. I had an idea that, if the topics given to the students to prepare their Assignments are non-repetitive, then they may do the task without copying others' content. Then, I thought why it shouldn't be combined together in the form of a book, which will help other students also. That is how this book got emerged. This is the 9th Volume for the academic year 2020-2021 with some other useful contents to make the students very well equipped in the foundation level especially for the students who come into the area of Autonomous.

The copy of this book will be maintained in the Department Library and also the e-content of this book has been posted in our college website. I hereby deliver my heartfelt thanks to the most honorable Correspondent Sir, the respected Principal Sir, and the beloved HOD(CS) Prof. P.Ramesh Sir, who gave me the freedom, to conduct an activity of this kind. I sincerely thank our beloved faculty members who have given me a moral support. I also thank our dear students for their co-operation. I hereby assure that the Department of Computer Science(UG) will always find ways for the betterment of the Students.
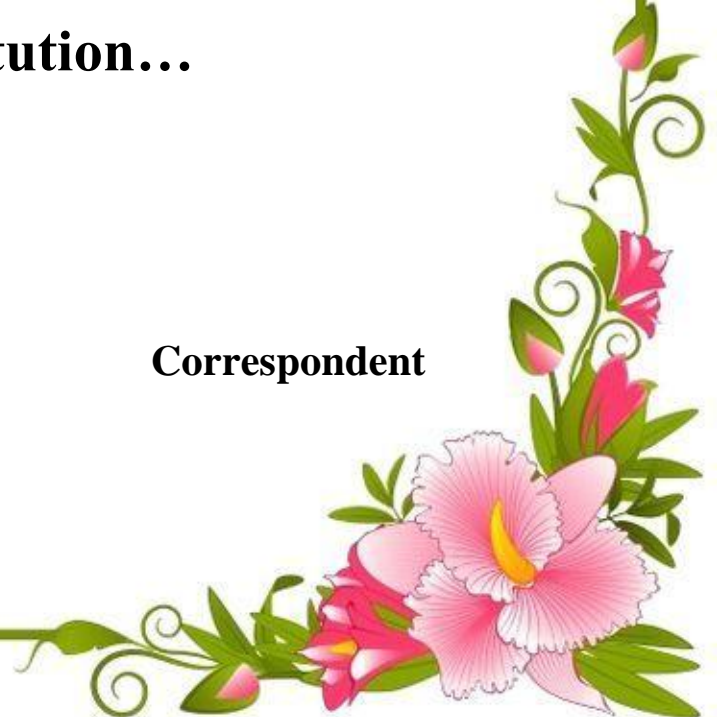
Thanking You,

INFO-GALLERY IN-CHARGE
Dr.R.PUSHPALATHA

27

YEARS OF EXCELLENCE

Since 1994

BEST WISHES

To all your present and future innovations for the betterment of our students and the Institution…

HOD   Principal   Correspondent

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2. Mr. S. MEGANATHAN - II B.Sc (CS) -'C'

1. A4 PROCESSOR

Introduction:

The Apple A4 is a 32-bit package on package(PoP) system on a chip(SoC) designed by Apple Inc. and manufactured by Samsung. It was the first SoC Apple designed in-house. The first product to feature the A4 was the first-generation iPad, followed by the iPhone4, fourth-generation iPod Touch, and second-generation Apple TV.

The last operating system update Apple provided for a mobile device containing an A4 (iPhone 4) was iOS 7.1.2, which was released on June 30, 2014. The last operating system update Apple provided for an Apple TV containing an A4(second-generation Apple TV) was Apple TV Software 6.2.1, which was released on September 17, 2014.

Apple A4 Processor in iPhone

Design:

Apple engineers designed the A4 chip with an emphasis on being "extremely powerful yet extremely power efficient." The A4 features a single-core ARM Cortex-A8 central processing unit (CPU) manufactured on Samsung's 45 nm fabrication process using performance enhancements developed by chip designer intrinsity (which was subsequently acquired by Apple) in collaboration with Samsung. The resulting CPU, dubbed "Hummingbird", is able to run at a far higher clock rate than previous Cortex-A8 CPUs while remaining fully compatible with the Cortex-A8 design provided by ARM. The same Cortex-A8 used in the A4 is also used in Samsung's S5PC110A01

SoC. The A4 also features a single-core PowerVR SGX535 graphics processing unit (GPU). The die of the A4 takes up 53.3 mm² of area.

The clock rate of the Cortex-A8 in the A4 used inside the first-generation iPad is 1 GHz. The clock rate of the Cortex-A8 in the A4 used inside the iPhone 4 and fourth-generation iPod Touch is 800 MHz (underclockedfrom 1 GHz). It is unknown what the clock rate of the Cortex-A8 in the A4 used inside the second-generation Apple TV.

The A4 uses the PoP method of installation to support RAM. The top package of the A4 used inside the first-generation iPad, the fourth-generation iPod Touch, and the second-generation Apple TV contains two 128 MB LPDDR chips, providing a total of 256 MB of RAM. The top package of the A4 used inside the iPhone 4 contains two 256 MB LPDDR chips, providing a total of 512 MB of RAM. The RAM is connected to the A4 using ARM's 64 bits wide AMBA 3 AXI bus.

Products featuring the Apple A4:

- iPad (1st generation)
- iPhone4
- iPod Touch (4th generation)
- Apple TV (2nd generation)

2. ADVANCED AUDIO CODING

Introduction:

Advanced Audio Coding(AAC) is an audio coding standard for lossy digital audio compression. Designed to be the successor of the MP3 format, AAC generally achieves higher sound quality than MP3 at the same bit rate.

AAC has been standardized by ISO and IEC as part of the MPEG-2 and MPEG-4 specifications. Part of AAC, HE-AAC ("AAC+"), is part of MPEG-4 Audio and adopted into digital radio standards DAB+ and Digital Radio Mondiale, as well as mobile television standards DVB-H and ATSC-M/H.

AAC supports inclusion of 48 full-bandwidth (up to 96 kHz) audio channels in one stream plus 16 low frequency effects (LFE, limited to 120 Hz) channels, up to 16 "coupling" or dialog channels, and up to 16 data streams. The quality for stereo is satisfactory to modest requirements at 96 kbit/s in joint stereo mode. Hi-Fi transparency demands data rates of at least 128 kbit/s (VBR). Tests of MPEG-4 audio have shown that AAC meets the requirements referred to as "transparent" for the ITU at 128 kbit/s for stereo, and 320 kbit/s for 5.1 audio. AAC uses only a modified discrete cosine transform (MDCT) algorithm, giving it higher compression efficiency than MP3, which uses a hybrid coding algorithm that is part MDCT and part FFT.

AAC is the default or standard audio format for iPhone, iPod, iPad, Nintendo DSi, Nintendo 3DS, iTunes, DivX Plus Web Player, PlayStation 3 and various Nokia Series 40 phones. It is supported on PlayStation Vita, Wii, SonyWalkman MP3 series and later, Android and BlackBerry. AAC is also supported by manufacturers of in-dash car audio systems.

Licensing and Patents:

No licenses or payments are required for a user to stream or distribute content in AAC format. This reason alone might have made AAC a more attractive format to distribute content than its predecessor MP3, particularly for streaming content (such as Internet radio) depending on the use case. A patent license is required for all manufacturers or developers of AAC codecs. For this reason, free and open source software implementations such as FFmpeg and FAAC may be distributed in source form only, in order to avoid patent infringement. The AAC patent holder include Bell Labs, Dolby, Fraunhofer, LG Electronics, NEC, NTT Docomo, Panasonic, Sony Corporation, ETRI, JVC Kenwood, Philips, Microsoft, and NTT.

Products that support AAC:

Japanese ISDB-T:

In December 2003, Japan started broadcasting terrestrial DTV ISDB-T standard that implements MPEG-2 video and MPEG-2 AAC audio. In April 2006 Japan started broadcasting the ISDB-T mobile sub-program, called 1seg, that was the first implementation of video H.264/AVC with audio HE-AAC in Terrestrial HDTV broadcasting service on the planet.

International ISDB-Tb:

In December 2007, Brazil started broadcasting terrestrial DTV standard called International ISDB-Tb that implements video coding H.264/AVC with audio AAC-LC on main program (single or multi) and video H.264/AVC with audio HE-AACv2 in the 1seg mobile sub-program.

3. AE LOCK IN CAMERA

Introduction:

AE Lock is a camera feature that allows us to lock the focus and exposure values when taking a photo. AE stands for Auto Exposure. Exposure refers to the brightness of the image. AE Lock button allows us to set the exposure settings - aperture, shutter speed, and ISO - and lock them into place.

One of the most common applications for using AE Lock is when we're taking multiple images that will be stitched together, like in a panorama. In that situation, each image needs to have the exact same exposure, that way there's no weird darkness or brightness issues from one image to the next.

Working:

To have exact same exposure, we simply dial in the appropriate exposure settings for the first shot in the sequence, engage AE Lock, and we can take the rest of the photos in the panorama with the confidence that each one will be exposed in the same manner. AE Lock can also be useful in situations in which there is dimlighting.

AE Lock Button in camera

Again, once we dial in the appropriate settings to get a well-exposed image, using AE Lock means we won't have to continuously adjust the exposure settings as we shoot in low light.

This works great assuming that the lighting conditions stay relatively constant as we're shooting. But if changes occur - it gets darker, for example - the exposure settings we've locked in will result in images that are too dark because they were locked in when there was more light available. As a result, bank on AE Lock only being good for a few shots at a time. Even if we get 2-3 shots, it's worth to use AE Lock.

Comparison with AF Lock:

The best application of AE Lock is quite similar to AF Lock. We can use AF Lock to lock the focus so we can recompose the shot as we wish. AE Lock does the same thing, only it allows us to lock the exposure settings and then recompose the shot.

All we have to do is frame up the shot to get a meter reading off the subject, engage AE Lock, recompose the shot, and then fire the shutter. Doing so allows us to maintain the initial meter readings, even if the act of recomposing the shot changes the exposure.

Sample picture with AE lock

4. AIRDROP SERVICE IN APPLE

Introduction:

AirDrop is a proprietary ad-hoc service in Apple Inc.'s iOS and macOS operating systems, introduced in Mac OS X Lion (Mac OS X 10.7) and iOS 7, which enables the transfer of files among supported Macintosh computers and iOS devices without using e-mail or a mass storage device.

Prior to OS X Yosemite (OS X 10.10), and under OS X Lion, Mountain Lion, and Mavericks (OS X 10.7–10.9, respectively) the AirDrop protocol in macOS was different from the AirDrop protocol of iOS, and the two were therefore not interoperable. OS X Yosemite and later support the iOS AirDrop protocol, which is used for transfers between a Mac and an iOS device as well as between two 2012 or newer Mac computers, and which uses both Wi-Fi and Bluetooth. Legacy mode for the old AirDrop protocol (which only uses Wi-Fi) between a 2012 or older Mac computer (or a computer running OS X Lion through OS X Mavericks) and another Mac computer was also available until macOS Mojave. There is no restriction on the size of the file which AirDrop will accommodate.

Apple AirDrop logo

Routine:
iOS:

On iOS 7, AirDrop can be accessed by either tapping on Settings > General >AirDrop, or swiping up the home screen through Control Center. Both Wi-Fi and Bluetooth are automatically switched on when AirDrop is enabled as they are both utilized.

Options for controlling AirDrop discovery by other devices include:

- No one can see device (AirDrop disabled)
- Only contacts can see device
- Everyone can see device.

In iOS 7, if an application implements AirDrop support, it is available through the share button. AirDrop is subject to a number of restrictions on iOS, such as the inability to share music or videos from the native apps.

macOS:

On Macs running macOS with Mac OS X 10.7 and greater, AirDrop is available in the Finder window sidebar. On Macs running OS X 10.8.1, it can be accessed through the menu option Go → AirDrop or by pressing ⇧ Shift +⌘ Cmd+ R.

Wi-Fi must be turned on in order for AirDrop to recognize the other device. The other device must also have AirDrop selected in a Finder window sidebar to be able to transfer files. Files are not automatically accepted; the receiving user must accept the transfer. This is done to improve security and privacy.

Steps to use AirDrop

5. ANIMOJI

Introduction:

ANIMOJI means "Animated Emoji". ANIMOJIs are customized animated emojis that use a user's own voice and facial expressions. They first appeared on the premium versions of the iPhone X, which was released in November 2017. Using the phone's 3D sensor and front-facing camera, users can create moving and talking versions of their favorite emojis which mimic their own expressions, including dogs that sing, monkeys that smile and piles of poop that squint. Only twelve ANIMOJIs were available on first release. They were: alien, cat, chicken, dog, fox, monkey, panda, pig, poop, rabbit, robot and unicorn. iPhone ANIMOJOs were originally restricted to 10 seconds in duration, but they can also be converted into stickers and pasted into messages.

Animojis in apple:

Apple's Animoji are custom animated messages that use our voice and reflect our facial expressions. There are over 25 emojis available, including poop, panda, pig, robot and ghost. They essentially mirror our facial expressions. As we move our face and talk, they will do the same, in real-time.

Animoji leverages the True Depth camera system used for Face ID, as well as the chip inside a compatible iPhone, to capture and analyze more than 50 different muscle movements in the face. It then mirrors the expressions in different emoji to produce Animoji.

Sample Animojis in Apple

Animojis in android:

Animoji is not available for Android. It's a built-in feature that's only available for iPhone X and on iMessage. We can also use alternative apps that have similar functions.

- Animojis of iPhone X use high tech Face-ID tech and its own standalone RGB camera to generate the live emojis.
- Android doesn't have any dedicated hardware or optimized software to create Animojis, so the apps just use the front camera.
- The accuracy of the apps will be far different from that of iPhone X. Unless we have any native hardware support, we can't guarantee 100% perfection performance from the apps.

Some of the Animoji Apps forAndroid:

- Face Cam
- 3D Avatar creator
- Super moji
- Mirror moji maker
- Bit moji
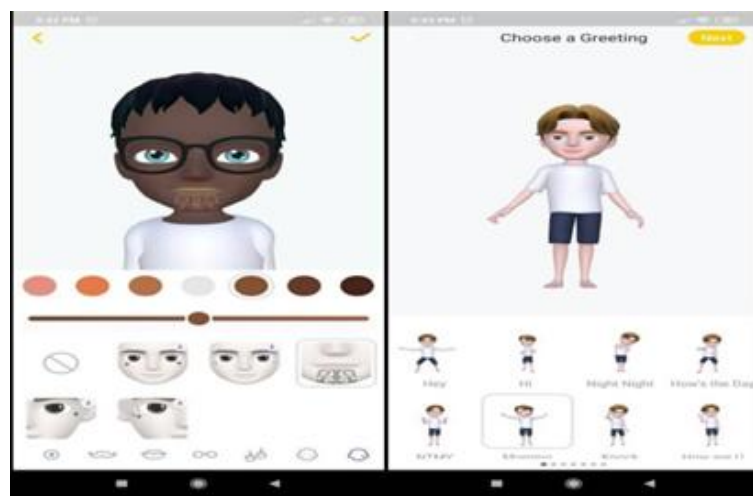
Animoji App for Android

6. AOL INSTANT MESSENGER

History:

In May 1997, AIM was released unceremoniously as a stand-alone download for Microsoft Windows. AIM was an outgrowth of "online messages" in the original platform written in PL/1 on a Stratus computer by Dave Brown. The software had the largest share of the instant messaging market in North America, especially in the United States (with 52% of the total reported as of 2006). This does not include other instant messaging software related to or developed by AOL, such as ICQ and iChat. Official mobile versions of AIM appeared in 2001 on Palm OS through the AOL Application. Third-party applications allowed it to be used in 2002 for the Sidekick. A version for Symbian OS was announced in 2003 and others for BlackBerry and Windows Mobile.
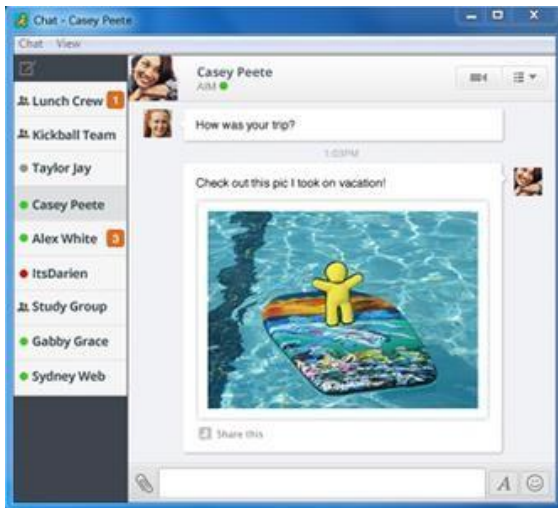
AIM mascot:

The AIM mascot was designed by JoRoan Lazaro and was implemented in the first release in 1997. The mascot appeared on all AIM logos and most wordmarks, and always appeared at the top of the buddy list. AIM's popularity in the late 1990s and the 2000s led to the "Running Man" becoming a familiar brand on the Internet. After 14 years, the iconic logo finally disappeared as part of the AIM rebranding in 2011. In August 2013, the "Running Man" once again returned. In 2014, a Complex editor called it a "symbol of America". In April 2015, the Running Man was

officially featured in the Virgin London Marathon, dressed by a person for the AOL-partnered Free The Children charity.

Protocol:

The standard protocol that AIM clients used to communicate is called Open System for Communication in Realtime(OSCAR). Most AOL-produced versions of AIM and popular thirdparty AIM clients use this protocol. AOL also created a simpler protocol called TOC that lacks many of OSCAR's features, and was used for clients that require basic chat functionality. The TOC/TOC2 protocol specifications were made available by AOL, while OSCAR is a closed protocol that third parties had to reverse-engineer.

Privacy:

For privacy regulations, AIM had strict age restrictions. AIM accounts are available only for people over the age of 13; children younger than that were not permitted access to AIM. Under the AIM Privacy Policy, AOL had no rights to read or monitor any private communications between users. The profile of the user had no privacy. In November 2002, AOL targeted the corporate industry with Enterprise AIM Services(EAS), a higher security version of AIM.

If public content was accessed, it could be used for online, print or broadcast advertising, etc. This was outlined in the policy and terms of service: "... you grant AOL, its parent, affiliates, subsidiaries, assigns, agents and licensees the irrevocable, perpetual, worldwide right to reproduce, display, perform, distribute, adapt and promote this Content in any medium". This allowed anything users posted to be used without a separate request for permission.

ChatBots:

AOL and various other companies supplied robots (bots) on AIM that could receive messages and send a response based on the bot's purpose. For example, bots could help with studying, like Study Buddy. Some were made to relate to children and teenagers, like Spleak.

The more useful chatbots had features like the ability to play games, get sport scores, weather forecasts or financial stock information. Users were able to talk to automated chatbots that could respond to natural human language. They were primarily put into place as a marketing strategy and for unique advertising options. It was used by advertisers to market products or build better consumer relations.

7. APPLE TELEVISION

Overview:

Apple TV is a digital media player and micro console developed and sold by Apple Inc. It is a small network appliance and entertainment device that can receive digital data for visual and audio content such as music, video, video games, or the screen display of certain other devices, and play it on a connected television set or other video display.

Historical Antecedents:

In an early attempt to enter the home entertainment industry, Apple released the Macintosh TV in 1993. Macintosh TV had a 14-inch CRT screen along with a TV tuner card. This did not prove to be a success, as only 10,000 units of Macintosh TV were sold up to its discontinuation in 1994. Apple's last major attempt to enter the home entertainment market before Apple TV occurred with their launch of Apple Bandai Pippin based on the Apple Pippin platform in the late 1990s. Apple Bandai Pippin combines a home game console with a networked computer.

Starting as early as 2011, Gene Munster, longtime investment banking analyst at Piper Jaffray covering Apple, regularly shared rumors that Apple would announce HDTV television set hardware to directly compete with Sony, LG, Samsung, and other TV makers, but Apple has never released such a product and Munster finally relented and recanted in 2015. This was despite the set being mentioned as a possibility for a future breakthrough product in Steve Jobs' biography Steve Jobs.

Features:

Apple TV allows consumers to use an HDTV to stream video, music, and podcasts as well as downloading apps and games from the tvOS App Store. The first, second, and third generations offered limited content which Apple had provisioned to work with Apple TV. These have now been discontinued in favor of the fourth generation Apple TV, with an OS based on iOS called tvOS which lets developers create their own apps with their own interface that run on Apple TV. These include multimedia, music apps, and games.

Features of Apple TV include:

- Video Streaming
- Casting and Mirroring
- Music and Podcasts Streaming
- Siri
- Photos
- Home Kit
- Apps and Games
- General Settings

Restrictions:

Apple has restricted access to most viewed charts on movies and podcasts. They are replaced by "Top Movies", "Top Podcasts", and "Editor's Picks". Parental controls allow consumers to limit access to Internet media service content via "Restrictions" settings; individual services can be turned off (e.g., to reduce clutter), icons can be rearranged via the tap-and-hold technique iOS. Internet media is split into four categories: "Internet", "Photos", "YouTube", "Podcasts", and "Purchase and Rental". Each of the categories is configured by a parental control of "Show", "Hide" or "Ask" to prompt for a 4-digit PIN. In addition, movies, TV shows, music and podcasts can be restricted by rating.

8. APPLE TOUCH ICON

Introduction :

      Apple touch icon or apple-touch-icon.png is a file used for a web page icon on the Apple iPhone, iPod Touch, and iPad. When someone bookmarks your web page or adds your web page to their home screen, this icon is used. If this file is not found these Apple products use the screenshot of the web page.

      If bookmarked websites and blogs have icons compatible with iPhone and iPad, then these icons will appear on the iPhone and iPad touchscreen. These icons are called Apple touch icons. If your site does not have Apple touch icons, then there is a chance of losing the branding of your websites and blogs.

## Making and Applying Touch Icon to the Website:

Having the proper icon will make the user remember its location on the device much easier and will increase the odds of it being clicked more often. Once you have selected a simplistic element or your logo for the job of an Apple icon, create a square.png file of it called apple-touch-icon with dimensions up to 180×180. We say up to 180×180 because there are 9 different main sizes for Apple icons starting from 57×57 which are the base size for the first iPhone while the iPhone 6 plus needs a 180×180 icon for its upgraded display and PPI (pixels per inch). Define the icon or icons in the header by using these HTML snippets.

Example:
<link rel="apple-touch-icon" sizes="57x57" href="https://yourdomain.com/apple-touch-icon-57x57.png">

<link rel="apple-touch-icon" sizes="180x180" href="https://yourdomain.com/apple-touch-icon-180x180.png">

This will help with the identification of the icon by the appropriate iOS device and will guarantee a smooth viewing experience for your visitors.
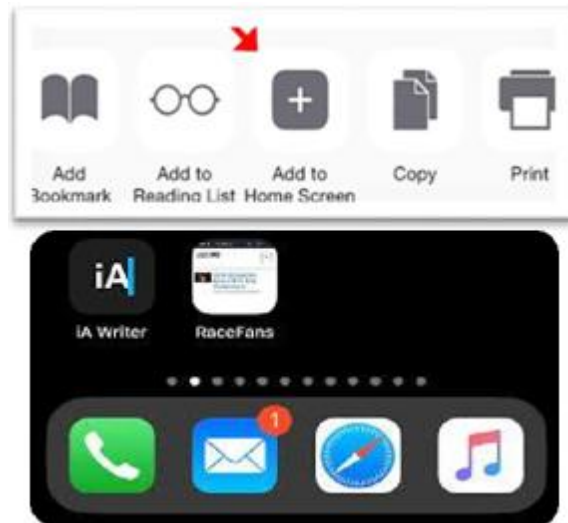
9. APPLE WATCH

Introduction:

Apple Watch is a line of smartwatches produced by Apple Inc. It incorporates fitness tracking, health-oriented capabilities, and wireless telecommunication, and integrates with iOS and other Apple products and services.

The Apple Watch was released in April 2015 and quickly became the best - selling wearable device: 4.2 million were sold in the second quarter of fiscal 2015. In subsequent years, a new generation of Apple Watch with an improved set of internal components labeled by Apple a 'Series', with certain exceptions has been introduced each September.

Each Series has been initially sold in multiple variants defined by the watch casing's material, color, and size except for the budget watches Series 1 and SE, available only in aluminium and beginning with Series 3, by the option in the aluminium variants for LTE cellular connectivity, which comes standard with the other materials. The band included with the watch can be selected from multiple options from Apple, and watch variants in aluminium co-branded with Nike and in stainless steel co-branded with Hermes are also offered, which include exclusive bands and digital watch faces carrying the companies' brandings.

Development:

The goal of the Apple Watch was to complement an iPhone and add new functions, and to free people from their phones. Kevin Lynch was hired by Apple to make wearable technology for the wrist. He said: "People are carrying their phones with them and looking at the screen so much. People want that level of engagement. But how

do we provide it in a way that's a little more human, a little more in the moment when you're with somebody?" Apple's development process was held under wraps until a wired article revealed some internal design decisions.

Developer   - AppleInc.

Manufacturer   - Quanta Computer

                                CompalElectronics

Type   - Smartwatch

Releasedate   - 1st Gen: April 24,2015

                       Series 1 and Series 2: September 16, 2016

                       Series 3: September 22,2017

                       Series 4: September 21,2018

                       Series 5: September 20,2019

                       Series 6 and SE: September 18, 2020

Controversies:

In December 2019, Dr.Joseph Wiesel, a New York University cardiologist, used Apple over allegations that the Apple Watch violates a patented method for detecting atrial fibrillation. Wiesel claimed the shared details of the patent with Apple in September 2017, but the company refused to negotiate.

10. BIXBY

Introduction:

Bixby is the Samsung intelligence assistant first introduced on the Galaxy S8 and S8+. We can interact with Bixby using their voice, text, or taps. It's deeply integrated into the phone, meaning that Bixby is able to carry out a lot of the tasks we do on the phone. The dedicated Bixby button on the left is a handy way to call up Bixby. A short press on the Bixby button takes us to the Bixby main page. Press and hold the Bixby button to talk to Bixby in a natural way, like a friend.

Language and country availability:

Bixby is available on Galaxy S20, S20+, S20 Ultra, Note10, Note10+, S10e, S10, S10+, Fold, Note9, S9, S9+, Note9, S8, and S8+.

In April 2018, Bixby is available in over 195 countries, but only in Korean, English (US only), and Chinese (Mandarin). The Chinese version of Bixby is only available on devices officially old in Main land China. Bixby Korean was launched on 1 May 2017 (KST). In December 2018, Samsung has deployed Bixby's voice command function in French. On 20 February 2019, Samsung announced the addition of further languages: English (British), German, Italian and Spanish (Spain). On 22

February 2020, Samsung announced the addition of Portuguese (Brazil), for Galaxy S10 & Note10, in Beta.

Features:

Bixby comes with five parts, known as "Bixby Voice," "Bixby Vision", "Bixby Home" (which has been recently replaced with "Samsung Free" in the latest One UI software update), "Bixby Routines" and "Bixby Touch" which Samsung has recently started developing.
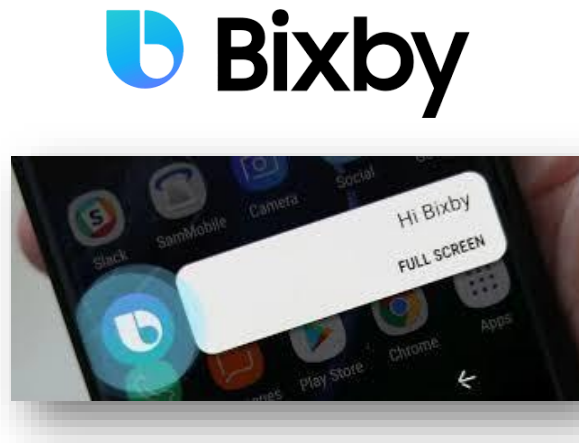
"Bixby Voice" is the name for the method of activating Bixby by calling it or doing a long press of the Bixby Button, located below the volume rocker. A while before the phone's release, the Bixby Button was reprogrammable and could be set to open other applications or assistants, such as Google Assistant. The phone's release the ability was removed with a firmware update, but can be remapped using third-party apps.

"Bixby Vision" is an augmented reality camera that can identify objects in real-time and potentially offer the user to purchase them online, translate text, read QR codes, and recognize landmarks. "Bixby Home" is a vertically scrolling list of information that Bixby can interact with, for example weather, fitness activity and buttons for controlling their smart home gadgets. "Bixby Touch" makes recommendations based on intelligent recognition. We can easily access services such as translation, online shopping, and media by touching the screen. This app is still in its development period and hasn't been publicly released yet. Of course, its APK has been publicly leaked and can be installed and used with some work around.

11. BOTHIE TECHNICAL FEATURES

A "Bothie" is a photo or a video that uses a split screen format to capture imagery or record footage through a mobile device's front-facing and rear-facing camera simultaneously. The term "Bothie" refers to the ability to use both cameras at the same time.

The origin of bothie:

Capturing photos or recording videos through a device's front and rear cameras isn't anything new, but it was Nokia that coined the term bothie with the introduction of its high-end Nokia 8 android device in August 2017 and its mid-range Nokia 7 android device in October 2017. Nokia makes bothies possible with what it calls "dual-sightmode" where the front and rear cameras are activated and the screen is split into two to show both views either as top-to-bottom if the device is held sideways or left-to-right if it's held sideways. The Nokia 7 and the Nokia 8 also come with built-in bothie streaming to Facebook live and Youtube live, so users can talk to the camera and show their viewers exactly where they are or what they're doing.

Other devices that can take bothie:

Two other known device makers that have their own bothie feature integrated into some of their device models include Samsung and lg. Samsung calls it a dual shot and lg calls it dual camera mode. The Samsung galaxy s4 and galaxy a5 come with dual shot functionality while the lg g2 vs980 has dual camera mode, but not all other Samsung and lg devices come equipped with it. Nokia's built-in live stream feature for bothies is also exclusive to the Nokia 7 and 8 devices only at this time, so if you're

hoping to jump on the bothie trend with a different device, you have no choice but to upgrade your device or do what most people would do to solve a problem — download an app.

Apps that let you take bothies:

You don't necessarily need a certain device with a built-in dual camera mode to take bothies thanks to the wonderful world of mobile apps. Here are couples worth checking out.

phoTWO for iOS:

phoTWO makes you take photos through the front and rear cameras separately before combining them. You can also only take photos and not videos. The app puts a small version of the photo from your front camera over a full-screen version of the photo taken from the rear camera in a collage-style layout, which you can then move around and adjust the size using your fingers.

Front back camera for android:

This app is newer than the two mentioned above, claiming to work like a dual camera that allows you to take two photos from both the front and rear before putting them together in a single photo. Unlike phoTWO, this one can take both photos through each camera at the same time.

12. BOTMASTER

A botmaster is a person who operates the command and control of botnets for remote process execution. The botnets are typically installed on compromised machines via various forms of remote code installation. The bot master will often hide his/her identify via proxies, TOR and/or shells to disguise.
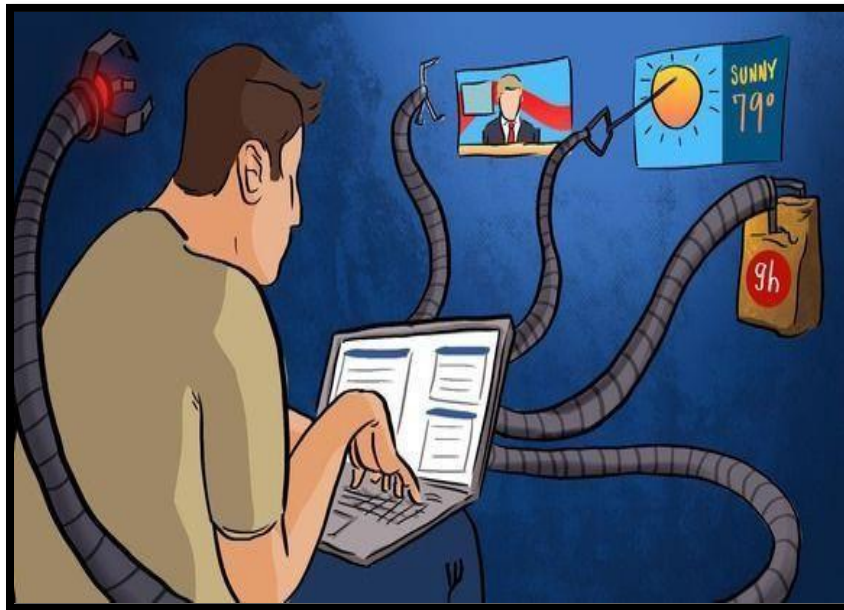
The new webmaster:

If the first phase of the chatbot revolution can be defined by the tools and frameworks for making chatbots, the next phase will be defined by the Botmaster and an army of bots that can assist humans in the maintenance and improvement of conversational experiences.

With the rise of the World Wide Web, any type of job emerged. The Webmaster was someone with fairly broad skillset, capable of providing ongoing maintenance and support for a website. A generalist programmer who could work with someone else's codebase, part designer comfortable in Photoshop, part editor capable of making small copy changes, part system administrator with the ability to navigate a server, or content management system, and with SEO insights and the ability to ensure that a websitewas optimized for visibility. With the rise of chatbots, a new role will emerge, the Bot master.

A Bot master is experienced with Growth Hacking:

A Bot master will be responsible for leading the discovery and user acquisition of bots. Analytics will help guide their actions, but a Bot master should be able to act on data and make faster, more informed decisions to execute creative strategies in order to acquire users.

We continue to make great strides in artificial intelligence and machine learning, but management will always need a human to take ownership and be accountable for the execution of a messaging strategy. A Bot master should assume that role, supported by virtual assistants in order to champion a conversational experience and achieve desired business results.

A Botmaster is a UX Engineer:

Technology will no doubt assist in defining and optimizing a conversational user experience but a Botmaster should have strong knowledge and experience leading on user experience design, able to engineer experiences working with various frameworks and bot building tools and be able to help make decisions on the best tech stack to meet plans and goals.

13. CHATBOT

What is Chatbot?

A chatbot is a software application used to conduct an on-line chat conversation via text or text-to-speech, in lieu of providing direct contact with a live human agent.

The term "ChatterBot" was originally coined by Michael Mauldin (creator of the first Verbot) in 1994 to describe these conversational programs. However, from a technological point of view, a chatbot only represents the natural evolution of a Question Answering system leveraging Natural Language Processing (NLP).

How a chatbot works?

There are two different tasks at the core of a chatbot:
- User request analysis
- Returning the response

Why chatbots are important?

Chatbot applications streamline interactions between people and services, enhancing customer experience. At the same time, they offer companies new opportunities to improve the customers engagement process and operational efficiency by reducing the typical cost of customer service. To be successful, a chatbot solution should be able to effectively perform both of these tasks.

Types of Chatbot Apps:

There are two major types of Chatbot Apps:

Goal-Oriented (G-O): Goal-Oriented Chatbots are open-ended; they're there for a conversation.

Purpose-Oriented (P-O): Purpose-Oriented Chatbots serve as a means to an end; they exist to make already existing processes easier or better performed.

Top 7 benefits of Chatbot:

- ○ Keeping Up with the Trends: Being Present on Messaging Platforms.
- ○ Improved Customer Service.
- ○ Increased Customer Engagement.
- ○ Monitoring Consumer Data & Gaining Insights.
- ○ Better Lead Generation, Qualification and Nurturing.
- ○ Easier Approach to Global Markets.
- ○ Cost Savings.

Limitations of Chatbot:
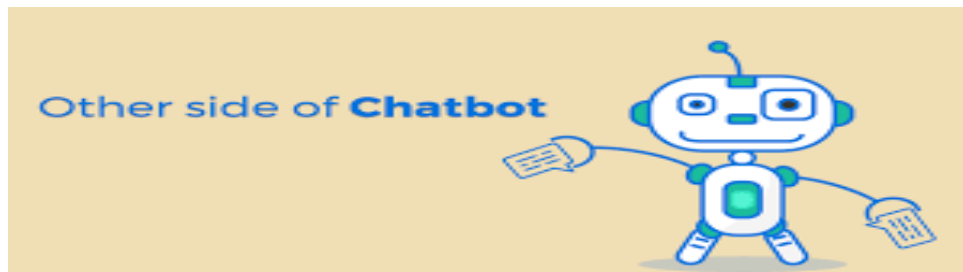
- ❖ As the database, used for output generation, is fixed and limited, chatbots can fail while dealing with an unsaved query.

- ❖ A chatbot's efficiency highly depends on language processing and is limited because of irregularities, such as accents and mistakes.

- ❖ Chatbots are unable to deal with multiple questions at the same time and so conversation opportunities are limited.

- ❖ Chatbots require a large amount of conversational data to train. Chatbots have difficulty managing non-linear conversations that must go back and forth on a topic with auser.

14. COMPLEMENTARY METAL OXIDE SEMICONDUCTOR IMAGE SENSOR

About CMOS:

Complementary metal oxide semiconductor (CMOS), also known as complementary-symmetry metal oxide semiconductor (COS-MOS), is a type of metal oxide semiconductor field-effect transistor (MOSFET) fabrication process that uses complementary and symmetrical pairs of p-type and n-type MOSFETs for logic functions. CMOS technology is used for constructing integrated circuit(IC) chips, including microprocessors, microcontrollers, memory chips (including CMOS BIOS), and other digital logic circuits. CMOS technology is also used for Analog circuits such as image sensors (CMOS sensors), data converters, RF circuits(RF CMOS), and highly integrated transceivers for many types of communication. An oxide insulator, which in
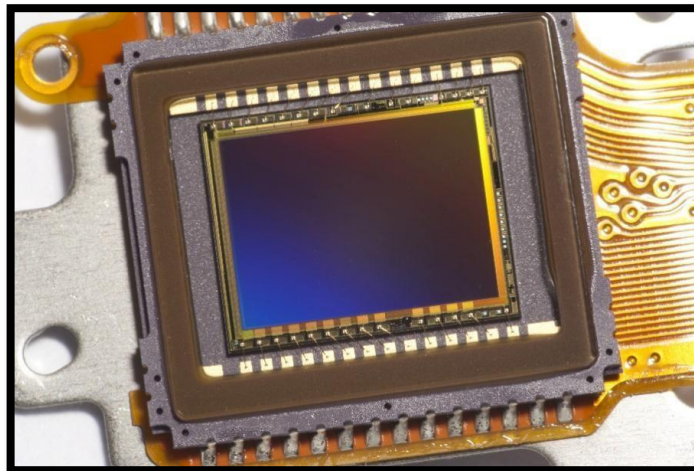
turn is on top of a semiconductor material. Aluminium was once used but now the material is polysilicon. Other metal gates have made a comeback with the advent of high-k dielectric materials in the CMOS process, as announced by IBM and Intel for the 45 nanometer node and smaller sizes. Two important characteristics of CMOS devices are high noise immunity and low static power consumption. Since one transistor of the MOSFET pair is always off, the series combination draws significant power only momentarily during switching between on and off states. Consequently, CMOS devices do not produce as much waste heat as other forms of logic, like NMOS logic or Transistor–Transistor Logic (TTL), which normally have some standing current even when not changing state. These characteristics allow CMOS to integrate a high density of logic functions on a chip. It was primarily for this reason

that CMOS became the most widely used technology to be implemented in VLSI chips.

Technical details:

"CMOS" refers to both a particular style of digital circuitry design and the family of processes used to implement that circuitry on integrated circuits (chips). CMOS circuitry dissipates less power than logic families with resistive loads. Since this advantage has increased and grown more important, CMOS processes and variants have come to dominate, thus the vast majority of modern integrated circuit manufacturing is on CMOS processes. CMOS logic consumes over 7 times less power than NMOSlogic, and about 100,000 times less power than bipolar transistor-transistor logic(TTL).
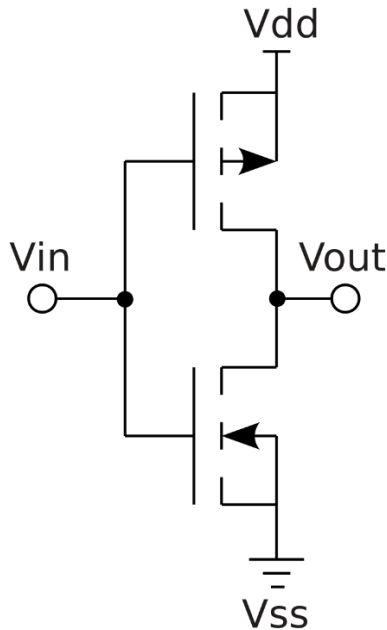
CMOS circuits use a combination of p-type and n-type metal oxide semiconductor field-effect transistor (MOSFETs) to implement logic gates and other digital circuits. Although CMOS logic can be implemented with discrete devices for demonstrations, commercial CMOS products are integrated circuits composed of up to billions of transistors of both types, on a rectangular piece of silicon of between 10 and 400 mm^2.

15. COIN CELL BATTERIES

Button batteries, also known as coin cell batteries, are flat, round, single cell batteries, used in personal and household products such as; children's toys, hearing aids, lights, watches, remote controls, digital thermometers and bathroom scales. Task force to investigate stronger button battery safety. North vale New York Electronics is distributing an advanced new rechargeable coin cell battery that delivers the world's highest Capacity. Rechargeable Lithium Ion Coin Cell Batteries Offer the Highest Capacity Available. The patent describes the ear bud as possibly having "an elastic ring arranged along an inner surface of the slot." It might also include a terminal where the sides and bottom of a coin cell battery can connect. Samsung Patents 'Air Pods Killer' Galaxy Buds with Changeable Batteries. The two "Metal Coin Cell" batteries are good for up to 20 hours of continuous use.

The lithium coin cell battery:

The lithium coin cell battery has a minimum one-year capacity, a temperature range of -20[degrees]C to 70[degrees]C, and relays the critical data to Android, IOS or any other Bluetooth-enabled device.

American Thermal Instruments: Electronic Data Logger Cells were assembled in the CR2032 coin cell cases using metallic lithium as anode and LFP as cathode. Analysis of the Separator Thickness and Porosity on the Performance of Lithium-Ion Batteries MPD's Snap Dragon series of surface-mount coin cell holders incorporate several new features which make it ideal for products which must work reliably when exposed to shock and vibration. One of the most popular coin cells in use right now is the CR2032 which is 20mm diameter x 3.2mm thick, provides 220mAhat3V.

Lithium coin cells can get as large as the CR2477 (24mm x 8mm) with a capacity of 1000mAh for $3.50.

CR1632 Terminal Description:

Pin Number	Pin Name	Description
1	Positive Terminal	The upper side where the markings are found is the positive terminal
2	Negative Terminal	The lower side of the battery is the negative terminal.
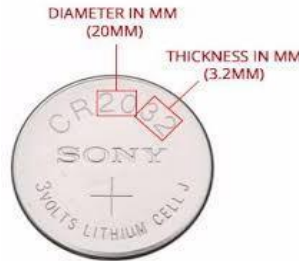
The other lithium cell is CR123, which is a 3V cell that's a bit thicker than AA battery and a bit shorter too. Another important parameter to consider while deciding your battery is the internal resistance of the battery. Sadly every battery will have some internal resistance associated with it which will prevent you from drawing maximum current from the battery. The lower the IR (Internal Resistance) the more current you will be able to draw from it and higher the efficiency of the battery will be, the IR of a battery will increase as it ages or due to its operating environment. When, performing Pulse Test at 25^0C, continuous background drain at 15k ohms is 0.19mA @ 2.9V. And, pulse drain in every 2 seconds *12 times/delay at 400 ohms is 6.8mA @2.7V.

16. DART LANGUAGE

Dart is a client-optimized programming language for apps on multiple platforms. It is developed by Google and is used to build mobile, desktop, server, and web applications. Dart is an object-oriented, class-based, garbage-collected language with C-style syntax. Dart can compile to either native code or JavaScript.

History:

Dart was unveiled at the GOTO conference in Aarhus, Denmark, October 10–12, 2011. The project was founded by Lars Bak and Kasper Lund. Dart 1.0 was released on November 14th, 2013. Dart initially had a mixed reception and the Dart initiative has been criticized by some for fragmenting the web, due to the original plans to include a Dart VM in Chrome. Those plans were dropped in 2015 with the 1.9 release of Dart to focus instead on compiling Dart to JavaScript.

Dartpad:

The Dart team created DartPad at the start of 2015, to provide an easier way to start using Dart. It is a fully online editor from which users can experiment with Dart application programming interfaces (APIs), and run Dartcode.

SIMD:

In 2013, John McCutchan announced that he had created a performance interface to single instruction, multiple data (SIMD) instruction sets for Dart.

The interface consists of two types:

- Float 32x4, 4single precision floating point values
- Uint 32x4, 4 32-bit unsigned integer values

Instances of these types are immutable and in optimized code are mapped directly to SIMD registers. Operations expressed in Dart typically are compiled into one instruction with no overhead. This is similar to C and C++ intrinsic. Benchmarks for 4×4 matrix multiplication, 3D vertex transformation, and Mandelbrot set visualization show near 400% speedup compared to scalar code written in Dart.

Advantages and Disadvantages of Dart Language:

- The first advantage is that it is easy to learn. Any JavaScript programmer can quickly relearn how to write code in Dart. To do this, they only need to familiarize themselves with the basic principles of this programming language.
- The second thing is about its availability of documentation. Since Google is developing the interpreter for Dart, all the features of the language are described in detail. This allows you to quickly get answers to almost any questions that may arise during the training process, or directly while writing code.
- The first drawback is that Dart has very limited resources online and it's hard to find solutions to problems. The reason for it is lack of a larger and cohesive developer communities, which will support you.
- Dart is fairly new to the programmers and rarely used in the market. So if you will look for a job on this position, it will be harder to find a company with a vacancy of Dart programmer, because it hasn't yet spread widely.

Uses of Dart Language:

Dart is a client-optimized programming language for apps on multiple platforms. It is developed by Google and is used to build mobile, desktop, server, and web applications. Dart is an object-oriented, class-based, garbage-collected language with C-style syntax. Dart can compile to either native code or JavaScript.

17. DATA CENTER INFRASTRUCTURE MANAGEMENT

Introduction:

Data center-infrastructure management (DCIM) is the integration of information technology (IT) and facility management disciplines to centralize monitoring, management and intelligent capacity planning of a data center's critical systems. Achieved through the implementation of specialized software, hardware and sensors, DCIM enables common, real-time monitoring and management platform for all interdependent systems across IT and facility infrastructures.
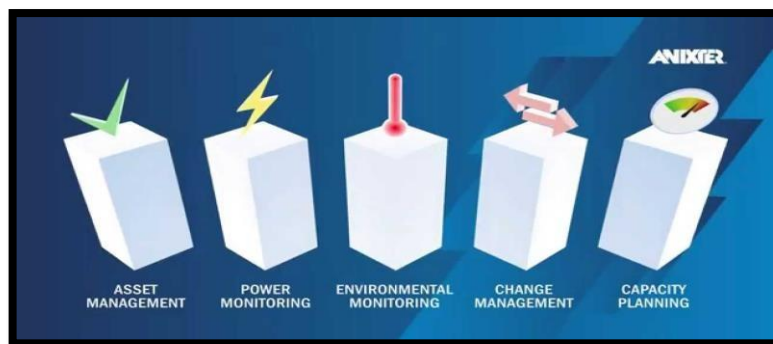
DCIM products can help data center managers identify and eliminate sources of risk and improve availability of critical IT systems. They can also be used to identify interdependencies between facility and IT infrastructures to alert the facility manager to gaps in system redundancy, and provide dynamic, holistic benchmarks on power consumption and efficiency to measure the effectiveness of "green IT" initiatives.

Important data center metrics include those regarding energy efficiency and utilization of servers, storage, and staff. In too many cases, disc capacity is vastly under-utilized and servers run at 20% utilization or less.

More effective automation tools can also improve the number of servers or virtual machines that a single admin can handle. DCIM providers are increasingly linking with computational fluid dynamics providers to predict complex airflow patterns in the data center.

The CFD component is necessary to quantify the impact of planned future changes on cooling resilience, capacity and efficiency.

Operations:

Information technology operations, or IT operations, are the set of all processes and services that are both provisioned by an IT staff to their internal or external clients and used by themselves to run themselves as a business. The term refers to the application of operations management to a business's technology needs. Operations work can include responding to tickets generated for maintenance work or customer issues. Some operations teams rely on on-call responses to incidents during off-hours periods

As lights out operations increased, less of the staff are located near corporate headquarters. Gartner defines IT operations as "the people and management processes associated with IT service management to deliver the right set of services at the right quality and at competitive costs for customers.

Outsourcing technical support:

Many organizations relocated their technical support departments or call centers to countries or regions with lower costs. Dell was amongst the first companies to outsource their technical support and customer service departments to India in 2001, but then restored. There has also been a growth in companies specializing in providing technical support to other organizations. These are often referred to as MSPs (Managed Service Providers). For businesses needing to provide technical support, outsourcing allows them to maintain a high availability of service. Such need may result from peaks in call volumes during the day, periods of high activity due to introduction of new products or maintenance service packs, or the requirement to provide customers with a high level of service at a low cost to the business. It allows businesses to utilize specialized personnel whose technical knowledge base and experience may exceed the scope of the business, thus providing a higher level of technical support to their employees.

18. DIGITAL ARTIFACT

An artifact is a by-product of software development. It's anything that is created so a piece of software can be developed. This might include things like data models, diagrams, setup scripts the list goes on.

Digital artifacts are all products of people. They help other developers see the thought process behind what goes into developing a piece of software. This, in turn, helps lead developers to further decisions and gives them a better understanding of how to proceed.

The Artifact Process:

Typically, a software development team will come up with a list of necessary artifacts for a piece of software before coding anything. These include things like risk assessments, source code, diagrams, and use cases. This is done during the research phase of the project.

Developing a piece of software without any of this is like building a house without blueprints. The process would be a huge mess, and crucial pieces would inevitably be left out. In this way, getting all your artifacts together is one of the most crucial parts of the software development life cycle.

Once all the initial artifacts are compiled, a development team can begin programming and building the actual program. Throughout this process, further artifacts might be developed. These can come up at any time and include everything from new sketches to use cases.

Some artifacts, like the end-user agreement, may need to be built after the software is complete for total accuracy. These may be added in before the program is compiled and sent out for consumption.

Importance of Artifacts:

- Artifacts are important to hold onto throughout the development process of any piece of software, and even long after.

- Without each and every artifact, it can make developing a piece of software much more difficult over time. This is especially true if development switches hands. When a new developer is put on a project, one of the first things they'll want to do is go through the artifacts to get an idea of how the software works.

- If an artifact is missing, that leaves a developer in the dark. This is why most artifacts are kept in a repository. This lets relevant developers accessing the artifacts at any time, all from one place**.**

19. ELIZA IN ARTIFICIAL INTELLIGENCE

ELIZA:

ELIZA is an early natural language processing computer program created from 1964 to 1966 at the MIT Artificial Intelligence Laboratory by Joseph Weizenbaum. Created to demonstrate the superficiality of communication between humans and machines, Eliza simulated conversation by using a "pattern matching" and substitution methodology that gave users an illusion of understanding on the part of the program, but had no built in framework for contextualizing events.

ELIZA's creator, Weizenbaum regarded the program as a method to show the superficiality of communication between man and machine, but was surprised by the number of individuals who attributed human-like feelings to the computer program, including Weizenabum's secretary.

Design:

Weizenbaum originally wrote ELIZA in MAD-Slip for the IBM 7094, as a program to make natural-language conversation possible with a computer. To accomplish this, Weizenbaum identified five "fundamental technical problems" for ELIZA to overcome: the identification of critical words, the discovery of a minimal context, the choice of appropriate transformations, the generation of responses appropriate to the transformation (or) in the absence of critical words and the provision of an ending capacity for ELIZA scripts.

Weizenabum soled these problems in his ELIZA program and made ELIZA such that it had no built-in contextual framework (or) universe of discourse. However, this required ELIZA to have a script of instructions on how to respond to inputs from users.

In Popular Culture:

In 1969, George Lucas and Walter Murch incorporated an Eliza-like dialogue interface in their screenplay for the feature film THX-1138. Inhabitants of the underground future world of THX, when stressed, would retreat to "confession booths" and initiate a one-sided Eliza-formula conversation with a Jesus-faced computer who claimed to be "Omm".

Eliza influenced a number of early computer games by demonstrating additional kinds of interface designs. Don Daglow wrote an enhanced version of the program called Ecala on a DEC PDP-10 minicomputer at Pomona College in 1973 before writing the computer role-playing game Dungeon.

Response and legacy:

Lay responses to Eliza were disturbing to Weizenbaum and motivated him to write his book Computer Power and Human Reason: From Judgment to Calculation, in which he explains the limits of computers, as he wants to make clear his opinion that the anthropomorphic views of computers are just a reduction of the human being and any life form for that matter. In the independent documentary film Plug & Pray (2010) Weizenbaum said that only people who misunderstood Eliza called it a sensation.

The Israeli poet David Avidan, who was fascinated with future technologies and their relation to art, desired to explore the use of computers for writing literature, he conducted several conversations with an APL implementation of Eliza and published them in English, and in his own translation to Hebrew- under the title My Electronic Psychiatrist-Eight Authentic Talks with a Computer. In the foreword he presented it as a form of constrained writing.

20. FACEBOOK TECHNICAL FEATURES

Face book is a social network service website launched on February 4, 2004 by Mark Zuckerberg. The following is a list of software and technology features that can be found on the Facebook website and mobile app and are available to users of the social media site.

News feeds:

On September 6, 2006, RuchiSanghvi announced a new home page feature called News Feed. Originally, when users logged into Facebook, they were presented with a customizable version of their own profile. The new layout, by contrast, created an alternative home page in which users saw a constantly updated list of their friends' Facebook activity. News Feed highlights information that includes profile changes, upcoming events, and birthdays, among other updates. Unlike in the News Feed, the user can delete events from the Mini Feed after they appear so that they are no longer visible to profile visitors. In 2011 Facebook updated the News Feed to show top stories and most recent stories in one feed, and the option to highlight stories to make them top stories, as well as to un-highlight stories.

Applications:

In February 2011, Facebook began to use the hCalendarmicroformat to mark up events, and the hCardmicroformat for the events' venues, enabling the extraction of details to users' own calendar or mapping applications. Third parties facilitate events to be exported from Facebook pages to the iCalendar-format.
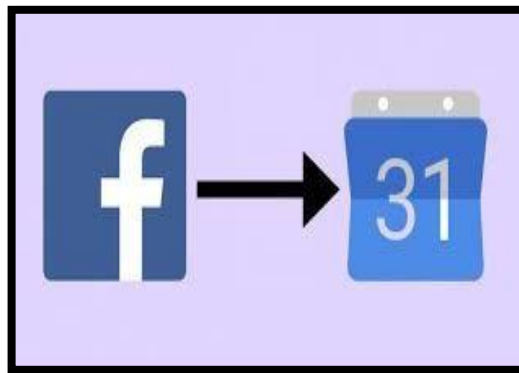
In 2007, Facebook introduced the Facebook Marketplace, allowing users to post classified ads within sale, housing, and jobs categories. In October 2016, Facebook

announced a new Marketplace, citing the growth of organized "buy and sell" Facebook Groups, and gave the new version a higher prominence in the main Facebook app, taking the navigation position previously held by Facebook Messenger.

Security:

On May 12, 2011, Facebook announced that it is launching several new security features designed to protect users from malware and from getting their accounts hijacked.

Facebook will display warnings when users are about to be duped by click jacking and cross-site scripting attacks in which they think they are following a link to an interesting news story or taking action to see a video and instead end up spamming their friends.

Removed features:

In February 2010, Tech Crunch reported that Facebook was working to rewrite its messaging service to turn it into a "fully featured webmail product", dubbed "Project Titan". The feature, unofficially dubbed a "Gmail killer" internally, was launched on November 15, 2010, and allowed users to directly communicate with each other via Facebook using several different methods. Users could create their own "username@facebook.com" email address to communicate, use text messaging, or through the Facebook website or mobile app's instant messaging chat. All messages were contained within single threads in a unified inbox. The email service was terminated in February 2014 because of low uptake.

21. FLICKR

Overview:

Flickr is an American image hosting and video hosting service, as well as an online community. It was created by Ludicorp in 2004 and is a popular way for amateur and professional photographers to host high-resolution photos. It has changed ownership several times and has been owned by Smug Mug since April 20, 2018.

As on March 20, 2013, Flickr had a total of 87 million registered members and more than 3.5 million new images uploaded daily, as reported by the Verge. On August 5, 2011, the site reported that it was hosting more than 6 billion images. Photos and videos can be accessed from Flickr without the need to register an account, but an account must be made to upload content to the site.

Flickr Features:

- Unlimited Storage.
- Ad-Free Browsing.
- Advanced Stats.
- Partner Discounts.
- Stats on your photo views.
- Ad-free browsing and sharing on Flickr.
- Desktop Uploader for automatically backing-up images.
- Ability to use specific commercial activity to promote the business and products.

Sale of Creative Commons-Licensed Photos:

In November 2014, Flickr announced that it would sell wall-sized prints of photos from the service that are licensed under Creative Commons licenses allowing commercial use. Although its use of the photos in this manner is legal and allowed under the licenses, Flickr was criticized by users for what they perceived to be unfair exploitation of artists' works, as all the profits from these offerings go to Yahoo! and are not shared with their respective photographers, and users were not given a means of opting-out from the program without placing their photos under a more restrictive non-commercial license.
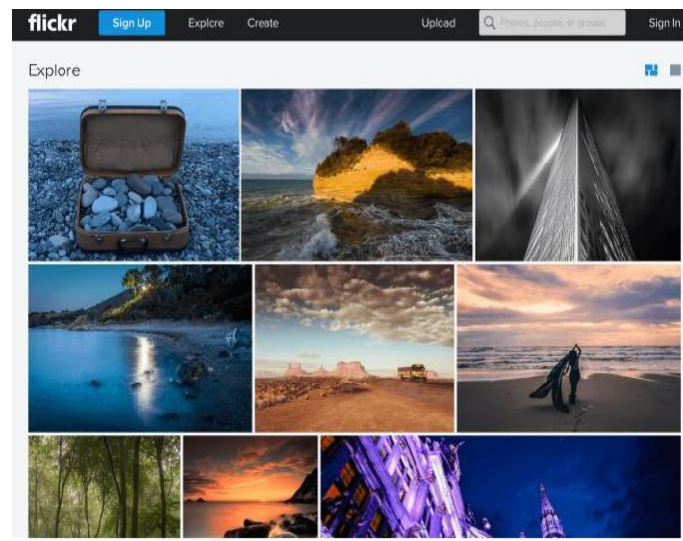
Deletion of files of non-paying users:

- On November 1, 2018, Flickr announced new restrictions for its users.
- On January 8, 2019, non-paying users are only able to upload up to 1000 files free of charge.
- On March 12, 2019, deletion of the oldest files, determined by the upload date, has begun until the limit of 1000 files is met. The size of the individual files is not relevant. Alternatively, users can upgrade to Pro subscription for US $70 per year.

22. FUZZY LOGIC

The term fuzzy logic was introduced with the 1965 proposal of fuzzy set theory by LotfiZadeh. Fuzzy logic had, however, been studied since the 1920s, as infinite-valued logic- notably by Lukasiewicz and Tarski.

Fuzzy logic is based on the observation that people make decisions based on imprecise and non-numerical information. Fuzzyodels or sets are mathematical means of representing vagueness and imprecise information. These models have the capability of recognizing, representing, manipulating, interpreting and utilizing data and information that are vague and lack certainty.
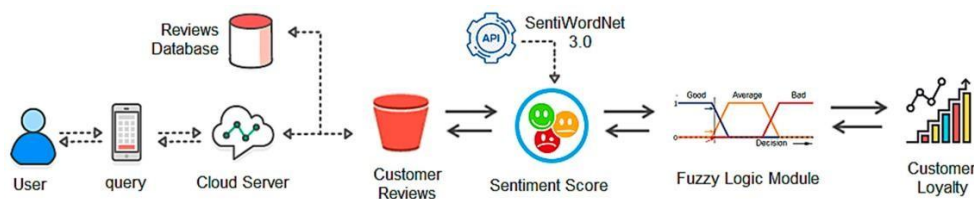
Overview:

Classical logic only permits conclusions which are either true or false. However, there are also propositions with variable answers, such as one might find when asking a group of people to identify a color. In such instances, the truth appears as the result of reasoning from inexact or particle knowledge in which the sampled answers are mapped on a spectrum.

Applying truth values:

A basic application might characterize various sub-ranges of a continuous variable. For instance, temperature measurements for anti-lock brakes might have several separate membership functions defining particular temperature ranges needed to control the brakes properly. Each function maps the same temperature value to a truth value in the 0 to 1 range. These truth values can then be used to determine how the brakes should be controlled. Fuzzy set theory provides a means for representing uncertainty.

Process:

- Fuzzify all input values into fuzzy membership functions.
- Execute all applicable rules in the rule base to compute the fuzzy output functions.
- De-fuzzify the fuzzy output functions to get "Crisp" output values.
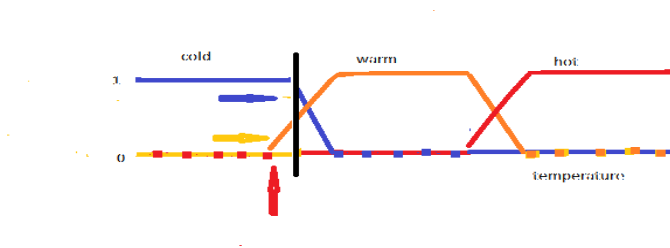
A common algorithm:

- For each truth value, cut the membership function at this value.
- Combine the resulting curves using the OR operator.
- Find the center-of-weight of the area under the curve.
- The X position of this center is then the final output.

Fuzzy databases:

The first fuzzy relational database, FRDB, appeared in Maria Zemankova's dissertation. Later, some other models arose like the Buckles-Petry model, the Prade-Testemale model, the Umano-Fukami model or the GEFRED model by j.m. Medina, M.A.vila et al.

Fuzzy querying languages have been defined, such as the SQLf by P.Bosc et al and the FSQL by J.Galindo et al. These languages define some structures in order to include fuzzy aspects in the SQL statements, like fuzzy conditions, fuzzy comparators, fuzzy constants, fuzzy labels etc.

23. GEO TAGGING

Geo Tagging is the process of adding geographical identification metadata to various media such as a Geo Tagged photograph or video, websites, SMS messages, QR Codes or RSS feeds and is a form of geospatial metadata. This data usually consists of latitude and longitude coordinates, though they can also include altitude, bearing, distance, accuracy data, and place names, and perhaps a time stamp. Geo Tagging can help users find a wide variety of location-specific information from a device. Geo Tagging enabled information services can also potentially be used to find location-based news, websites, or other resources.

The geographical location data used in Geo Tagging can, in almost every case, be derived from the global positioning system, and based on a latitude/longitude-coordinate system that presents each location on the earth from 180° west through 180° east along the Equator and 90° north through 90° south along the prime meridian.

Applications:

In social media:

Facebook users can Geotag photos that can be added to the page of the location they are tagging. Instagram uses a map feature that allows users to Geotag photos.

Audio/video files:

Audio/video files can be Geotagged via: metadata, audio encoding, overlay, or with companion files. Metadata records the geospatial data in the encoded video file to be decoded for later analysis.

Photos:

Two main options can be used to Geotag photos: capturing GPS information at the time the photo is taken or "attaching" geocoordinates to the photograph after the picture is taken.
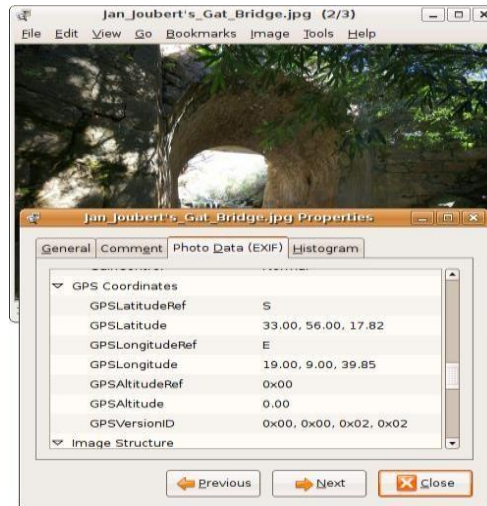
SMS messages:

The GeoSMS standard works by embedding one or more 'geo' URIs in the body of an SMS. For example, I'm at the pub geo: 37.801631, 144.980294;u=16

Geo blogging:

Geo blogging attaches specific geographic location information to blog entries via geotags. Searching a list of blogs and pictures tagged using geotag technology allows users to select areas of specific interest to them on interactive maps.

Dangers:

Publishing photos and other media tagged with exact geolocation on the Internet allows random people to track an individual's location and correlate it with other information. These dangers can be avoided by removing geotags with a metadata removal tool for photos before publishing them on the Internet. Another newly realized danger of Geo Tagging is the location information provided to criminal gangs and poachers on the where abouts of often endangered animals. This can effectively make tourists scouts for these poachers, so Geo Tagging should be turned off when photographing these animals.

24. GOOGLE ASSISTANT

Introduction:

Google Assistant is Google's voice assistant Artificial Intelligence for Android devices. It provides a virtual personal assistant experience through a natural language speech interface to perform a variety of tasks.

As a voice assistant, Google Assistant adds two-way conversation abilities to Google's earlier assistant service, Google Now, which is a web and text-based service. Assistant uses cognitive computing, machine learning and voice recognition technology.

Platform Expansion:

For system-level integration outside of the Allo app and Google home, the Google Assistant was initially exclusive to the Pixel and Pixel XL smartphones. In February 2017, Google announced that it had begun to enable access to the Assistant on Android smartphones running Android Marshmallow or Nougat, beginning in select English-speaking markets. Android tablets did not receive the Assistant as part of this rollout. The Assistant is also integrated in Android wear 2.0, and will be included in future versions of Android TV and Android Auto. In October 2017, the Google Pixel book became the first laptop to include Google Assistant. Google Assistant later came to the Google Pixel Buds. In December 2017, Google announced that the Assistant would be released for phones running Android Lollipop through an update to Google Play Services, as well as tablets running 6.0 Marshmallow and 7.0 Nougat. In February 2019, Google reportedly began testing ads in Google Assistant results.

On May 15, 2017, Android Police reported that the Google Assistant would be coming to the iOS operating system as a separate app. The information was confirmed two days later at Google's developer conference.

Interaction:

Google Assistant, in the nature and manner of Google Now, can search the Internet, schedule events and alarms, adjust hardware settings on the user's device, and show information from the user's Google account. Unlike Google Now, however, the Assistant can engage in a two-way conversation, using Google's natural language processing algorithm. Search results are presented in a card format that users can tap to open the page.

Voices:

Google Assistant launched using the voice of Kiki Baessell for the American female voice, the same actress for the Google Voice voicemail system since 2010. On October 11, 2019, Google announced that Issa Rae had been added to Google Assistant as an optional voice, which could be enabled by the user by saying "Okay, Google, talk like Issa".
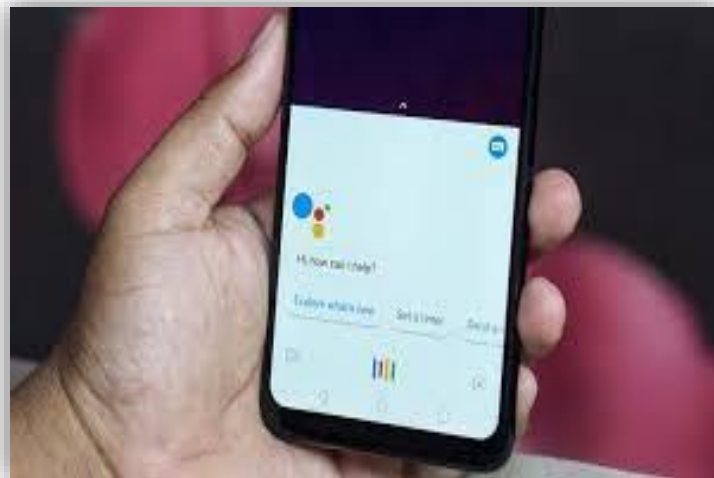
25. HOPEBOT

Overview:

Hopebot is a helper bot developed by Computer Hope derived from some of the work done on the ZERO chatbot. Its role is to assist with and maintain order in the Computer Hope chat channel. Hopebot is written in Perl and connects to IRC channels using the Net: IRC Perl module.

In 2015, a branch of Hopebot was integrated into the Computer Hope search to help direct visitors to pages. For example, typing any computer-related term in our search uses Hopebot to automatically forward you to the appropriate page, if available.

Hopebot Features:

- Identify several hundred thousand different computer questions and forward users to appropriate pages.
- Forward to any of the over 15,000 computer terms we have defined.
- Correct common misspellings, grammar, and incorrectly used computer terms.

- Command searches, e.g., Dir command.
- Color code look up, e.g., #0000ff.
- CH issue ID look up, e.g., ch001002.
- Forward searches asking for results in a non-English language to a translated result.
- Log any unknown questions so they can be answered.
- Integrated with other Computer Hope tools.

Example of Questions Hopebot Can Answer:

Hopebot can answer several hundred thousand different questions and direct users to pages answering their search queries.

Define any Computer Term:

One of the most difficult things with computers and computer-related topics is all of the different terminology, abbreviations, and acronyms. Hopebot makes it easy and fast to get definitions for these terms in question form or by only typing the term. For example, typing "Motherboard" or "what is a Motherboard" into the search automatically forwards you to the Motherboard definition.

26. INFERENCE ENGINE

Inference Engine:

Inference engine is a component of the system that applies logical rules to the knowledge base to deduce new information. The first inference engines were components of expert systems. The typical expert system consisted of a knowledge base an inference engine. The knowledge base stored facts about the world. The inference engine applies logical rules to the knowledge base and deduced new knowledge.

Architectures:

The logic that an inference engine uses is typically represented as IF-THEN rules. The general format of such rules is IF <logical expression> THEN <logical expression>, the development of expert systems and inference engines, artificial intelligence researchers focused on more powerful theorem prover environments that offered much fuller implementations of first-order logic. The innovation of integrating the inference engine with a user interface led to the second early advancement of expert systems: explanation capabilities. The explicit representation of knowledge as rules rather than code made it possible to generate explanations to users: both explanations in real time and after the fact.
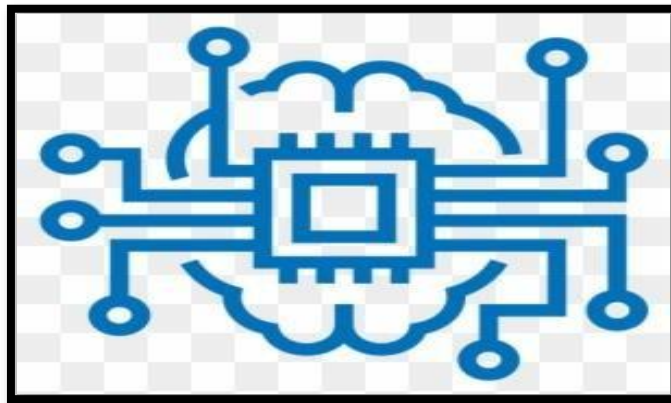
Action selection mechanism:

Action selection is a way of characterizing the most basic problem of intelligent systems. In artificial intelligence and computational cognitive science, "the action selection problem" is typically associated with intelligent agents and the artificial systems that exhibit complex reaction in an agent environment. The term is also

sometimes used in ethnology or animal behavior. One problem for understanding action selection is determining the level of abstraction used for specifying an "act". At the most basic level of abstraction, an atomic act could be anything from contracting a muscle cell to provoking a war. Typically for any one action-selection mechanism, the set of possible actions is predefined and fixed.

Backward chaining:

Backward chaining is an inference method described colloquially as working backward from the goal. It is used in automated theorem provers, inference engines, proof assistants, and other AI applications. Backward chaining is implemented in logic programming by SLD resolution. Both rules are based on the modus ponens inference rule. It is one of the two most commonly used methods of reasoning with inference rules and logical implications.
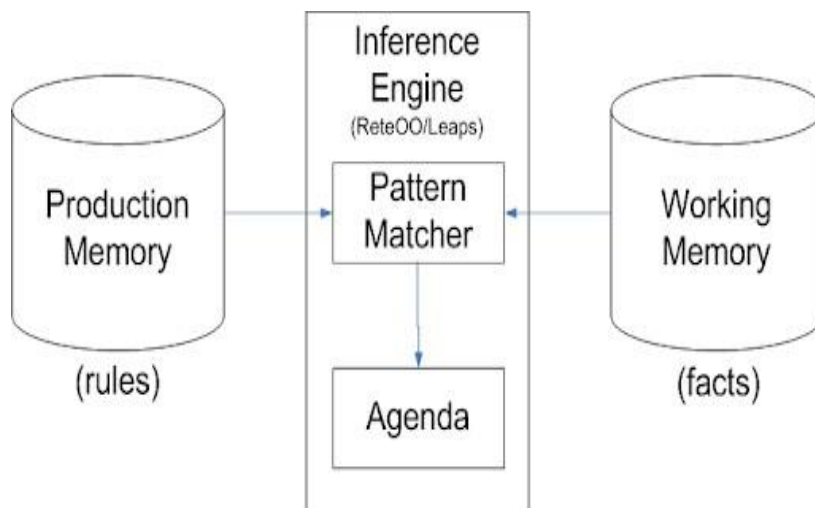
Forward chaining:

Forward chaining is one of the two main methods of reasoning when using an inference engine and can be described logically as repeated application of modus ponens. Forward chaining is a popular implementation   strategy   for expert systems, business and production rule systems. The opposite of forward chaining is backward chaining.

27. INSTAGRAM TECHNICAL FEATURES

Introduction:

Instagram is one of the social media cite, which is packed full of features and is constantly changing to keep up with the evolution of the social space. Some of Instagram new features are, IGTV Ads, Instagram Live shopping, and much more. Instagram is finally giving creators the ability to earn money from the content they share on IGTV a highly requested feature from Instagram creator community.

Video Features:

People are probably familiar with Instagram Video posts – they're like regular photo posts, except they allow for video up to 60 seconds long. We can add a filter, a caption and tag our location before we share the post. Video posts generate more user engagement than photos on Instagram. This is huge for brands who are looking to win with Instagram new algorithm which tracks user engagement in our posts to determine whether or not to display the content.
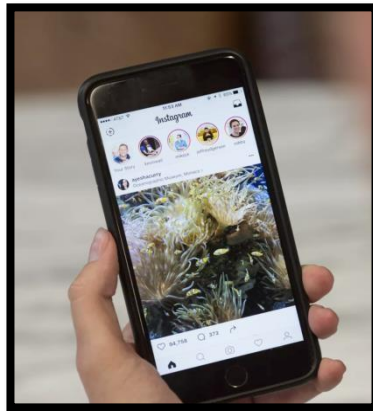
Instagram Live Video:

Live Video is different than Instagram Video because well, it's live. Here's how it works: Followers get a push notification telling them you're going live. They can comment on or like our video stream in real time. The video is gone after we end it.

This is another way for marketers to build brand transparency and authenticity – both being important with Instagram latest algorithm update.

IGTV:

Instagram TV is an app within Instagram that gives users the ability to share videos that are up to an hour long – like a TV episode IGTV gives marketers the ability to share longer video content with the advantage of the users being notified when you share a new video is shared.

Getting the Most Out of Instagram Features with Sprout Social:

With all of the marketing possibilities available with Instagram, it may seem overwhelming trying to keep track of all your initiatives. Fortunately, a social media management platform like Sprout is all that is needed for publishing at optimal times, detailed reporting, establishing a smooth workflow and much more. Take the first step toward simplifying Instagram efforts with a 30-day free trial or learn more through a personalized demo.

Stories Features:

One of the biggest additions to Instagram as of late is the Stories feature. To view Story content as many times as you want within that 24-hour period. Stories appear as little circles in the top of your followers' feeds.

Shoppable Tags In Stories:

Shoppable tags allow businesses to tag their products in their photos. For example, if you feature a model running in your brand's running shoes – you'd tag the shoes so that users can click right over to the product page and purchase the shoes. Now, businesses can tag products inside Stories as well.

28. LITHIUM-ION BATTERIES

Introduction:

A prototype Li-ion battery was developed by Akira Yoshino in 1985, based on earlier research by John Goodenough, M.Stanley Whittingham, Rachid Yazami and Koichi Mizushima during the 1970s–1980s and then a commercial Li-ion battery was developed by a Sony and Asahi Kasei team led by Yoshio Nishi in 1991. In 2019, The Nobel Prize in Chemistry was given to Yoshino, Goodenough, and Whittingham "for the development of lithium-ion batteries".

A lithium-ion (Li-ion) battery is an advanced battery technology that uses lithium ions as a key component of its electrochemistry. Lithium-ion batteries are commonly used for portable electronics and electric vehicles and are growing in popularity for military and aerospace applications.

Primary battery and secondary battery:

- A primary battery is a portable voltaic cell that is not rechargeable.
  Example: zinc–carbon cells.
- A secondary battery is a portable voltaic cell that is rechargeable.
  Example: Li-ion battery.

Battery consists of:

The battery consists of an anode of Lithium, dissolved as ions, into a carbon. The cathode material is made up from Lithium liberating compounds.

Construction of Li-ion Battery:

Li-ion cell has a four-layer structure. A positive electrode made with Lithium Cobalt Oxide has a current collector made of thin aluminum foil – Cathode. A negative electrode made with specialty carbon has a current collector of thin copper foil – anode.

A separator is a fine porous polymer film. An electrolyte made with lithium salt in an organic solvent. The electrolytes are selected in such a way that there should be an effective transport of Li-ion to the cathode during discharge. The type of conductivity of electrolyte is ionic in nature rather than electronic.

Working of Li-ion battery:

A battery is made up of an anode, cathode, separator, electrolyte, and two current collectors (positive and negative). The anode and cathode store the lithium. The electrolyte carries positively charged lithium ions from the anode to the cathode and vice versa through the separator. The movement of the lithium ions creates free electrons in the anode which creates a charge at the positive current collector. The electrical current then flows from the current collector through a device being powered (cell phone, computer, etc.) to the negative current collector. The separator blocks the flow of electrons inside the battery.

While the battery is discharging and providing an electric current, the anode releases lithium ions to the cathode, generating a flow of electrons from one side to the other. When plugging in the device, the opposite happens: Lithium ions are released by the cathode and received by the anode.
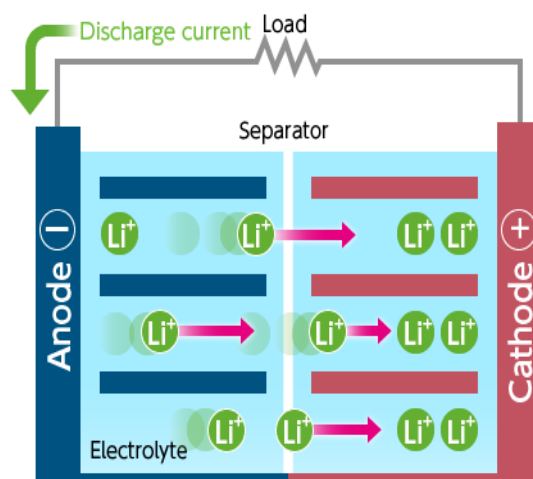
29. LISP

Introduction:

The Lisp language is the oldest and most widely used functional language. Lisp is essentially type less, but originally had two types of data objects: atoms and lists. Indeed, Lisp stands for "List Processing." Lisp has long been a popular language for applications in artificial intelligence. Scheme is a well known dialect of Lisp that was created at MIT. It is small in size and is available on many platforms. Common Lisp is another dialect of Lisp. It was created in the 1980s with an objective to unite many of the Lisp dialects into a single language. Hence, Common Lisp is quite large and complex, yet it retains the basic nature of Lisp.

Key points:

Lisp empowers programmers to write faster programs. An empirical study shows that when programmers tackle the same problems in Lisp and some other programming languages, that the Lisp programs are smaller, take less time to develop. The Lisp family of programming languages makes it easy to create extensible macros, which facilitate the creation of modularized extensions to help bioinformaticians easily create plug-ins for their software.
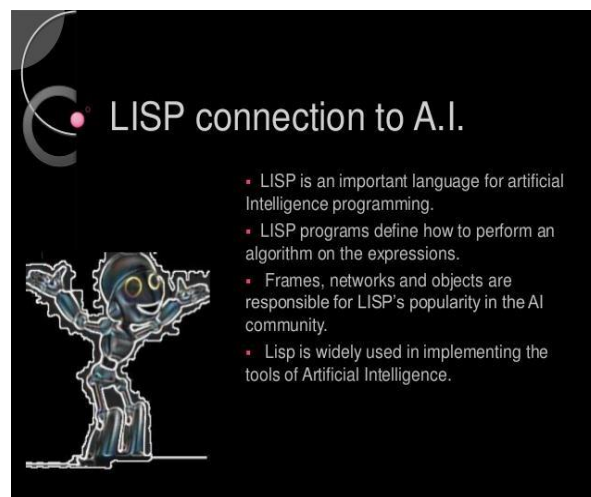
Lisp is also used for making Artificial Intelligence (AI) programs because; it supports the implementation of software that computes with symbols very well. Symbols,

symbolic expressions and computing with those is at the core of Lisp. Common lisp (CL) is a dialect of the Lisp Programming Language. Common Lisp is great for symbolic AI.

It is not much as faster than any other programming languages like Java and Python, but comparatively this is simpler than the others. The Artificial Intelligence programs are larger and longer in size. Also Lisp is used in Hackers programs.

Lisp Machine

Lisp machines are general-purpose computers designed to efficiently run Lisp as their main software and programming language, usually via hardware support. They are an example of high-level language computer architecture, and in a sense, they were the first commercial single-user workstations. Lisp machines commercially pioneered many now-common place technologies, including effective garbage collection, laser printing, windowing systems, computer mice, high-resolution bit-mapped raster graphics, computer graphic rendering, and networking innovations such as Chaosnet.

30. MEGAPIXEL

Introduction:

A megapixel is one million pixels. A pixel is a single site or spot on a digital image sensor that gathers photons of light, and converts these photons into electronic information. A single pixel is a single point of light, the smallest unit of measurement in a digital image. The pixels cumulatively receive, "count" photons of light on a whole digital sensor, and convert the light into the electronic information that makes up a digital image.

Pixel:

A pixel is generally thought of as the smallest single component of a digital image. However, the definition is highly context-sensitive. For example, there can be "printed pixels" in a page, or pixels carried by electronic signals, or represented by digital values, or pixels on a display device or pixels in a digital camera. This list is not exhaustive and, depending on context, synonyms include pel, sample, byte, bit, dot, and spot

Megapixel:

A megapixel (MP) is a million pixels; the term is used not only for the number of pixels in an image but also to express the number of image sensor elements of digital cameras or the number of display elements of digital displays. For example, a camera that makes a 2048 × 1536 pixel image typically uses a few extra rows and columns of sensor elements and is commonly said to have "3.2,3.4 megapixels", depending on whether the number reported is the effective or the "total pixel count.
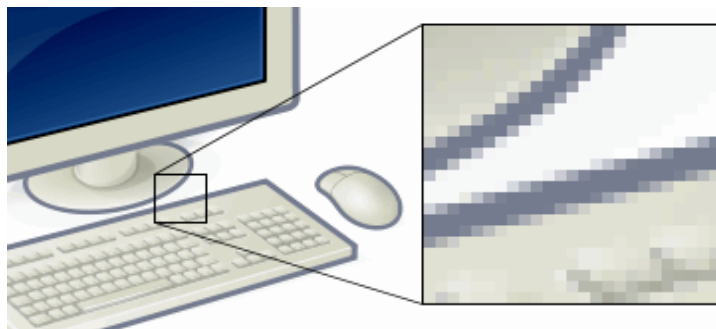
Resolution of computer monitors:

Computers can use pixels to display an image, often an abstract image that represents a GUI. The resolution of this image is called the display resolution and is determined by the video card of the computer. LCD monitors also use pixels to display an image, and have a native resolution. Each pixel is made up of triads, with the number of these triads determining the native resolution. Most CRT monitors do not have a fixed beam sweep rate, meaning they do not have a native resolution at all, instead they have a set of resolutions that are equally well supported.

Display Resolutions:

The display resolution or display modes of a digital television, computers monitor or display device is the number of distinct pixels in each dimension that can be displayed. It can be an ambiguous term especially as the displayed resolution is controlled by different factors in cathode ray tube (CRT) displays, flat-panel displays and projection displays using fixed picture-element (pixel) arrays. It is usually quoted as width × height, with the units in pixels: for example, 1024 × 768 means the width is 1024 pixels and the height is 768 pixels.

One use of the term display resolution applies to fixed-pixel-array displays such as plasma display panels (PDP), liquid-crystal displays (LCD), Digital Light Processing (DLP) projectors, OLED displays, and similar technologies. It is simply the physical number of columns and rows of pixels creating the display (e.g. 1920 × 1080). A consequence of having a fixed-grid display is that, for multi- format video inputs, all displays need a "scaling engine" to match the incoming picture format to display.
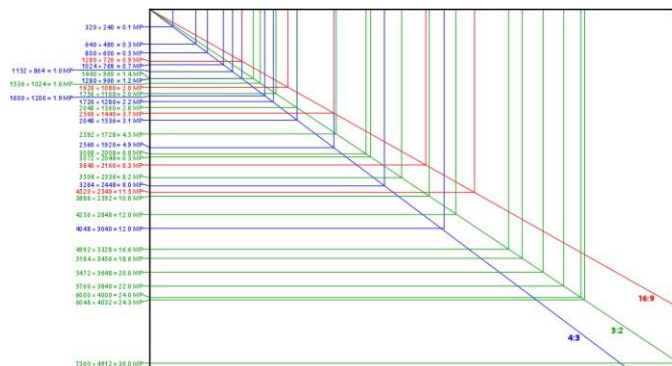

Diagram of common sensor resolutions of digital cameras including megapixel values

31. MEMORY STICK

Introduction:

Memory stick is a removable flash memorable card format, originally launched by Sony in late 1998. In addition to the original Memory Stick, this family includes the Memory Stick PRO, a revision that allows greater maximum storage capacity and faster file transfer speeds; Memory Stick Duo, a small-form-factor version of the Memory Stick (including the PRO Duo); the even smaller Memory Stick Micro (M2), and the Memory Stick PRO-HG, a high speed variant of the PRO to be used in high definition video and still cameras.

As a proprietary format, Sony exclusively used Memory Stick on its products in the 2000s such as Cyber-shot digital cameras, Handy Cam digital camcorders, WEGA and Bravia TV sets, VAIO PCs, early Walkman digital audio players, and the Play station portable handheld game console, with the format being licensed to a few other companies early in its lifetime. With increasing popularity of SD Card, in 2010 Sony started to support the SD card format, which was seen as a Sony loss in the memory-card format war. Despite this, Sony continued to support Memory Stick on certain devices.

Memory Sticks are used as storage media for a portable device, in a form that can easily be removed for access by a personal computer. For example, Sony digital compact cameras use Memory Stick for storing image files. The original Memory Stick is approximately the size and thickness of a stick of chewing gum. It was available in capacities from 4 MB to 128 MB (1 MB = one million bytes). It was available both with and without Magic Gate support.

The Magic Gate-capable memory sticks were white-colored, while the standard version was purple. The original Memory Stick is no longer manufactured.

Memory Stick PRO Duo:

The Memory Stick PRO Duo (MSPD) quickly replaced the Memory Stick Duo due to the Duo's size limitation of 128 MB and slow transfer speed. Memory Stick PRO Duos are available in all the same variants as the larger Memory Stick PRO, with and without High Speed mode, and with and without MagicGate support.

Sony has released different versions of Memory Stick PRO Duo. A Memory Stick PRO Duo with MagicGate was released as a 512 MB stick. Additionally, a 16 GB version on March 2008 and another 32 GB version on August 21, 2009. In 2009, Sony and SanDisk also announced the joint development of an expanded Memory Stick PRO format tentatively named "Memory Stick PRO Format for Extended High Capacity". Sony has since finalized the format and released its specification under the new name, Memory Stick XC.

On December 11, 2006, Sony, together with SanDisk, announced the Memory Stick PRO-HG Duo. While only serial and 4-bit parallel interfaces are supported in the Memory Stick PRO format, an 8-bit parallel interface was added to the Memory Stick PRO-HG format. Also, the maximum interface clock frequency was increased from 40 MHz to 60 MHz. With these enhancements, a theoretical transfer rate of 480 Mbit/s (60 MB/s) is achieved, which is three times faster than the Memory Stick PRO format.

32. NATURAL LANGUAGE PROCESSING

Introduction:

Natural language processing (NLP) is a subfield of linguistics, computer science, and artificial intelligence concerned with the interactions between computers and human language, in particular how to program computers to process and analyze large amounts of natural language data. The result is a computer capable of "understanding" the contents of documents, including the contextual nuances of the language within them. The technology can then accurately extract information and insights contained in the documents as well as categorize and organize the documents themselves.

Speech recognition:

Given a sound clip of a person or people speaking, determine the textual representation of the speech. This is the opposite of text to speech and is one of the extremely difficult problems colloquially termed "AI-complete". In natural speech there are hardly any pauses between successive words, and thus speech segmentation is a necessary subtask of speech recognition. In most spoken languages, the sounds representing successive letters blend into each other in a process termed coarticulation, so the conversion of the analog signal to discrete characters can be a very difficult process. Also, given that words in the same language are spoken by people with different accents, the speech recognition software must be able to recognize the wide variety of input as being identical to each other in terms of its textual equivalent.

Speech segmentation:

Given a sound clip of a person or people speaking, separate it into words. A subtask of speech recognition and typically grouped with it.

Text-to-speech:

Given a text, transform those units and produce a spoken representation. Text-to-speech can be used to aid the visually impaired.
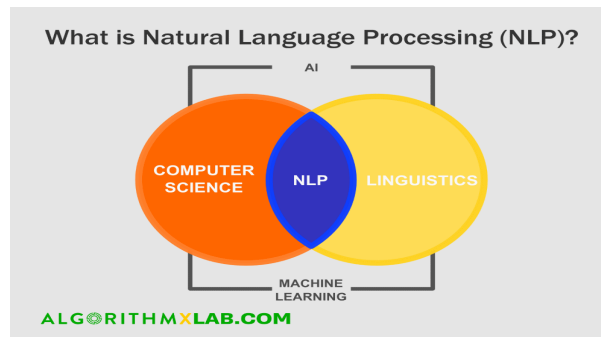
Use Cases of NLP :

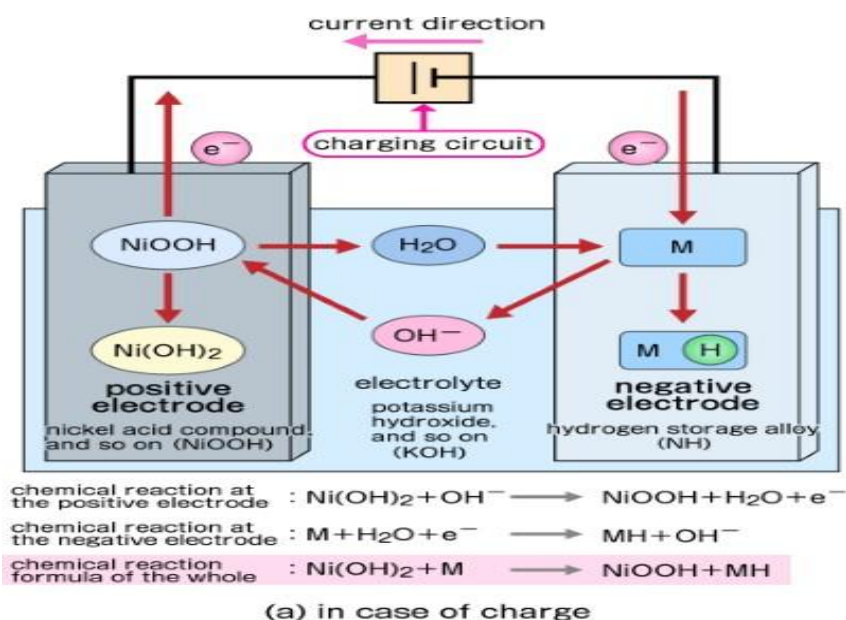NLP can help you with lots of tasks and the fields of application just seem to increase on a daily basis.

- NLP enables there cognition and prediction of diseases based on electronic health records and patient's own speech. This capability is being explored in health conditions that go from cardiovascular diseases to depression and even schizophrenia. For example, Amazon Comprehend Medical is a service that uses NLP to extract disease conditions, medications, and treatment outcomes from patient notes, clinical trial reports, and other electronic health records.

- Organizations can determine what customers are saying about a service or product by identifying and extracting information in sources like social media. This sentiment analysis can provide a lot of information about customers' choices and their decision drivers.

- Companies like Yahoo and Google filter and classify your emails with NLP by analyzing text in emails that flow through their servers and stopping spam before they even enter your inbox.

33. NICKEL-CADMIUM BATTERY

Introduction:

The nickel–cadmium battery (Ni-Cd battery or NiCad battery) is a type of rechargeable battery using nickel oxide hydroxide and metallic cadmium as electrodes. The abbreviation Ni-Cd is derived from the chemical symbols of nickel (Ni) and cadmium (Cd): the abbreviation NiCad is a registered trademark of SAFT Corporation, although this brand name is commonly used to describe all Ni–Cd batteries.

current direction

charging circuit

e^- e^-

NiOOH → H_2O → M

OH$^-$

Ni(OH)$_2$ M H

positive electrode
nickel acid compound and so on (NiOOH)

electrolyte
potassium hydroxide. and so on (KOH)

negative electrode
hydrogen storage alloy (NH)

chemical reaction at the positive electrode : $Ni(OH)_2 + OH^- \longrightarrow NiOOH + H_2O + e^-$

chemical reaction at the negative electrode : $M + H_2O + e^- \longrightarrow MH + OH^-$

chemical reaction formula of the whole : $Ni(OH)_2 + M \longrightarrow NiOOH + MH$

(a) in case of charge

Construction and Working:

Ni-Cd batteries usually have a metal case with a sealing plate equipped with a self-sealing safety valve. The positive and negative electrode plates, isolated from each other by the separator, are rolled in a spiral shape inside the case. This is known as the jelly-roll design and allows a Ni–Cd cell to deliver a much higher maximum current than an equivalent size alkaline cell. Alkaline cells have a bobbin construction where the cell casing is filled with electrolyte and contains a graphite rod which acts as the positive electrode. As a relatively small area of the electrode is in contact with the

electrolyte (as opposed to the jelly-roll design), the internal resistance for an equivalent sized alkaline cell is higher which limits the maximum current that can be delivered.

Nickel-cadmium (NiCd) batteries compete with lead-acid batteries because they have a higher energy density (50-75 Wh/kg) and have a longer life (2000-2500 cycles). They are good for uninterruptible power supply and generator-starting applications.
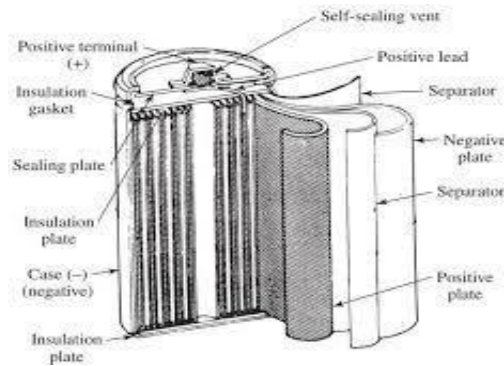
Sealed Ni-Cd cells were at one time widely used in portable power tools, photography equipment, flashlights, emergency lighting, hobby R/C, and portable electronic devices. The superior capacity of Nickel-metal hydride batteries, and recent lower cost, has largely supplanted Ni-Cd use.

The anode of an electrochemical cell is usually a metal that is oxidized (gives up electrons) at a potential between 0.5 volt and about 4 volts above that of the cathode. The cathode generally consists of a metal oxide or sulphide that is converted to a less-oxidized state by accepting electrons, along with ions, into its structure. A conductive link via an external circuit (e.g., a lamp or other device) must be provided to carry electrons from the anode to the negative battery contact. Sufficient electrolyte must be present as well. The electrolyte consists of a solvent (water, an organic liquid, or even a solid) and one or more chemicals that dissociate into ions in the solvent. These ions serve to deliver electrons and chemical matter through the cell interior to balance the flow of electric current outside the cell during cell operation. When replacing a lead-acid battery with a NiCad battery, the battery compartment must be clean, dry, and free of all traces of acid from the old battery. The compartment must be washed out and neutralized with ammonia or boric acid solution, allowed to dry thoroughly, and then painted with an alkali-resisting varnish.

34. PROLOG

Introduction:

Prolog is a logic programming language associated with artificial intelligence and computational linguistics. Prolog has been widely used for developing complex applications, especially in the field of Artificial Intelligence. Although it is a general-purpose language, its main strengths are for symbolic rather than for numerical computation.

Prolog has its roots in first-order logic, a formal logic, and unlike many other programming languages, Prolog is intended primarily as a declarative programming language: the program logic is expressed in terms of relations, represented as facts and rules. A computation is initiated by running a query over these relations.

The language was developed and implemented in Marseille, France, in 1972 by Alain Colmerauer and Philippe Roussel, based on Robert Kowalski's procedural interpretation of Horn clauses

Prolog was one of the first logic programming languages and remains the most popular such language today, with several free and commercial implementations available. The language has been used for theorem proving, expert systems, term rewriting, type systems, and automated planning, as well as its original intended field of use, natural language processing. Modern Prolog environments support the creation of graphical user interfaces, as well as administrative and networked applications.

Prolog is well-suited for specific tasks that benefit from rule-based logical queries such as searching databases, voice control systems, and filling templates.
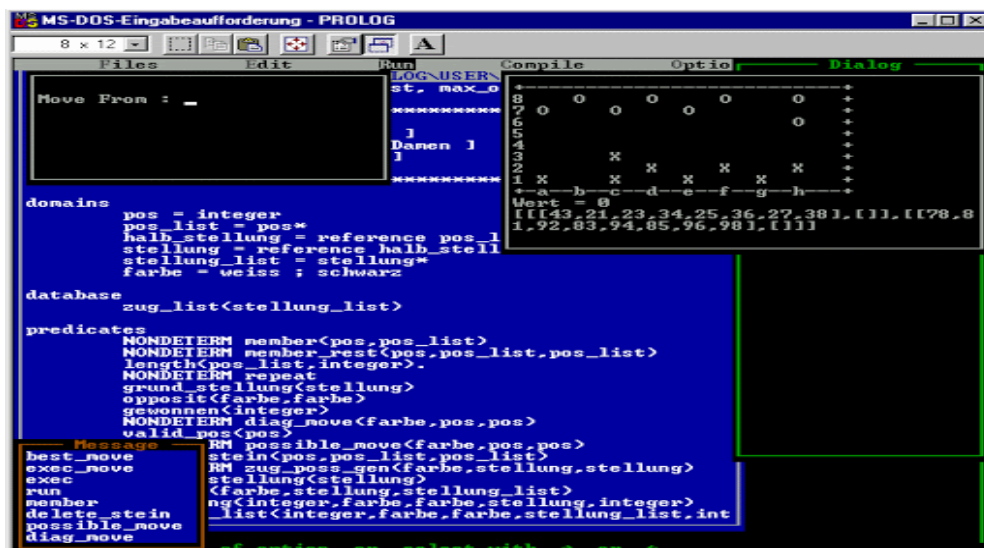

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Data Types:

Prolog's single datatype is the term. Term is either a atoms, numbers, variables or compound terms.

- An atom is a general-purpose name with no inherent meaning. Examples of atoms include x, red, 'Taco', and 'some atom'.
- Numbers can be floats or integers. ISO standard compatible Prolog systems can check the Prolog flag "bounded". Most of the major Prolog systems support arbitrary length integer numbers.
- Variables are denoted by a string consisting of letters, numbers and underscore characters, and beginning with an upper-case letter or underscore. Variables closely resemble variables in logic in that they are placeholders for arbitrary terms.

Special cases of compound terms:

- A List is an ordered collection of terms. It is denoted by square brackets with the terms separated by commas, or in the case of the empty list, by []. For example, [1,2,3] or[red, green, blue] .
- Strings: A sequence of characters surrounded by quotes is equivalent to either a list of (numeric) character codes, a list of characters (atoms of length 1), or an atom depending on the value of the Prolog flag double quotes. For example, "To be, or not to be".

ISO Prolog provides the atom/1, number/1, integer/1 , and float/1 predicates for type-checking.

35. QUICK DRAW

Introduction:

"Quick Draw!" is an online game, which was developed by Google. It was launched in Mid-November 2016, as a game where the players have to draw the picture of the object, while the Google algorithm has to guess what it is. In otherwise, just like Pictionary.
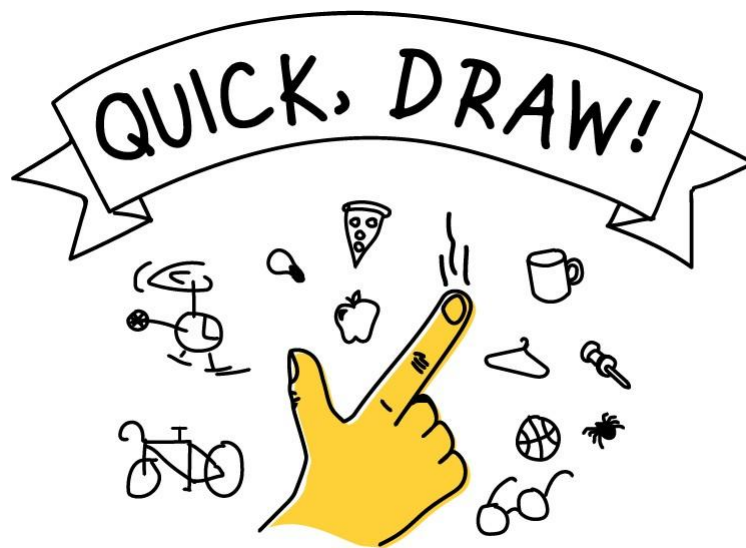

The AI learns from each drawing, increasing its ability to guess correctly in the future. The game is similar to Pictionary in that the player only has a limited time to draw (20 seconds). The concepts that it guesses can be simple, like 'foot', or more complicated, like 'animal migration'. This game is one of many simple games created by Google that are AI based as part of a project known as 'AI Experiments'.

The player starts with an object to draw (for example it may say "Draw a chair in under 19 seconds"). Then the player has 19 seconds to draw that object. Based on what they draw, the AI guesses what they are drawing. When the drawing is close enough to the item they were given to draw, it will say something like "I know, it's a chair!" and the player will be moved on to the next round. There are six rounds in a game of Quick, *Draw!* and at the end the game shows what other people have drawn in the categories the player didn't draw successfully.

Online Handwriting recognition:

Online handwriting recognition consists of recognizing structured patterns in free form hand written input. While Google products like Translate, Keep and Handwriting Input use this technology to recognize handwritten text, it works for any predefined pattern for which enough training data is available. The same technology that lets you digitize handwritten text can also be used to improve your drawing abilities and build virtual worlds, and represents an exciting research direction that explores the potential of handwriting as a human-computer interaction modality. For example the "Quick, Draw!" game generated a dataset of 50M drawings (out of more than 1B that were drawn) which itself inspired many different new projects.

In order to encourage further research in this exciting field, we have launched the Kaggle "Quick, Draw!" Doodle Recognition Challenge, which tasks participants to build a better machine learning classifier for the existing "Quick, Draw!" dataset. Importantly, since the training data comes from the game itself (where drawings can be incomplete or may not match the label), this challenge requires the development of a classifier that can effectively learn from noisy data and perform well on a manually labelled test set from a different distribution.
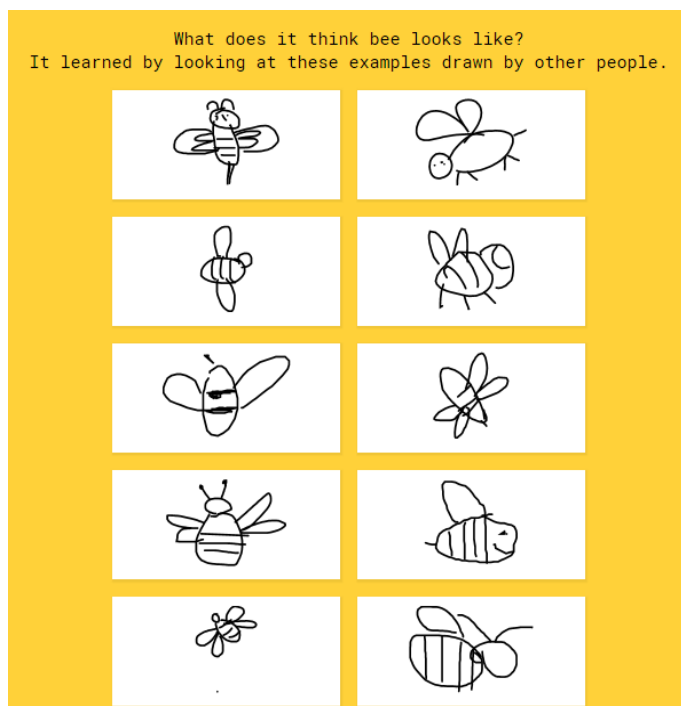
36. RED-EYE EFFECT IN CAMERA

Red-eye effect:

The red-eye effect in photography is the common appearance of red pupils in color photographs of the eyes of humans and several other animals. It occurs when using a photographic flash that is very close to the camera lens in ambient lowlight.

Causes:

In flash photography the light of the flash occurs too fast for the pupil to close, so much of the very bright light from the flash passes into the eye through the pupil, reflects off the fundus at the back of the eyeball and out through the pupil. The main cause of the red color is the ample amount of blood in the choroid which nourishes the back of the eye and is located behind the retina. The blood in the retinal circulation is far less than in the choroid, and plays virtually no role. The eye contains several photo stable pigments that all absorb in the short wavelength region, and hence contribute somewhat to the red eye effect. The lens cuts off deep blue and violet light, below 430 nm depending on age and macular pigment absorbs between 400 and 500 nm, but this pigment is located exclusively in the tiny fovea. Melanin, located in the retinal pigment epithelium (RPE) and the choroid, shows a gradually increasing absorption towards the short wavelengths. But blood is the main determinant of the red color, because it is completely transparent at long wavelengths and abruptly starts absorbing at 600 nm.
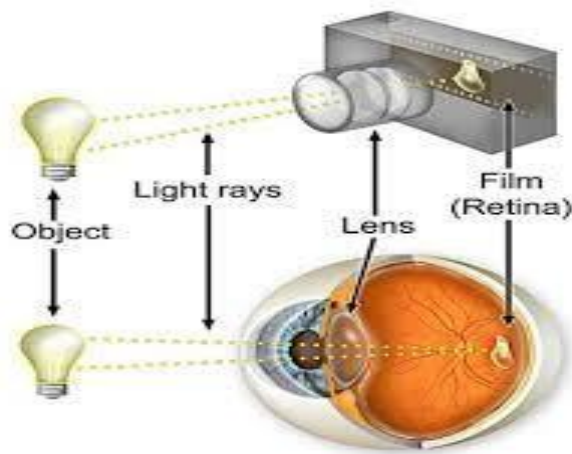
Effects:

The amount of red light emerging from the pupil depends on the amount of melanin in the layers behind the retina. This amount varies strongly between individuals. The role of melanin in red-eye effect is demonstrated in animals with heterochromia: only the blue eye displays the effect. All forms of albinism involve abnormal production and/or deposition of melanin. Red-eye effect is seen in photographs of children also because children's eyes have more rapid dark adaption: in low light a child's pupils enlarge sooner, and an enlarged pupil accentuates the red-eye effect.

Photography techniques for prevention and removal:

The red-eye effect can be prevented in a number of ways.

- Using bounce flash in which the flash head is aimed at a nearby pale colored surface such as a ceiling or wall or at a specialist photographic reflector. This both changes the direction of the flash and ensures that only diffused flash light enters the eye.
- Placing the flash away from the camera's optical axis ensures that the light from the flash hits the eye at an oblique angle. The light enters the eye in a direction away from the optical axis of the camera and is refocused by the eye lens back along the same axis. Because of this the retina will not be visible to the camera and the eyes will appear natural.


Understanding 'Red-Eye'
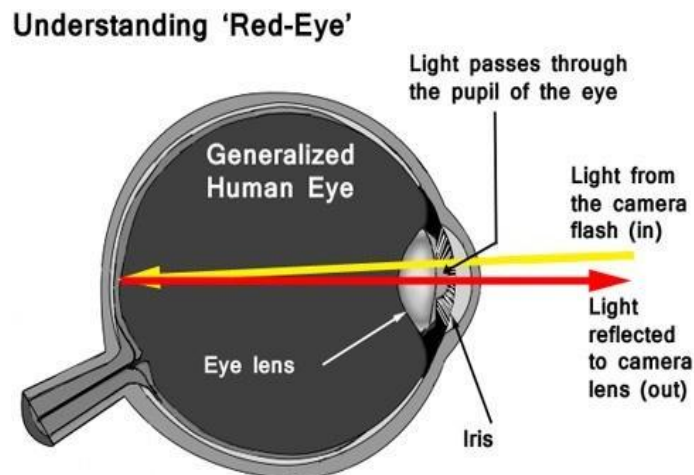
37. SAFARI INTERNET BROWSER

Safari browser:

Safari is a graphical web browser developed by Apple, based on the WebKit engine. First released on desktop in 2003 with Mac OS X Panther, a mobile version has been bundled with iOS devices since the iPhone's introduction in 2007. Safari is the default browser on Apple devices. A Windows version was available from 2007 to 2012.
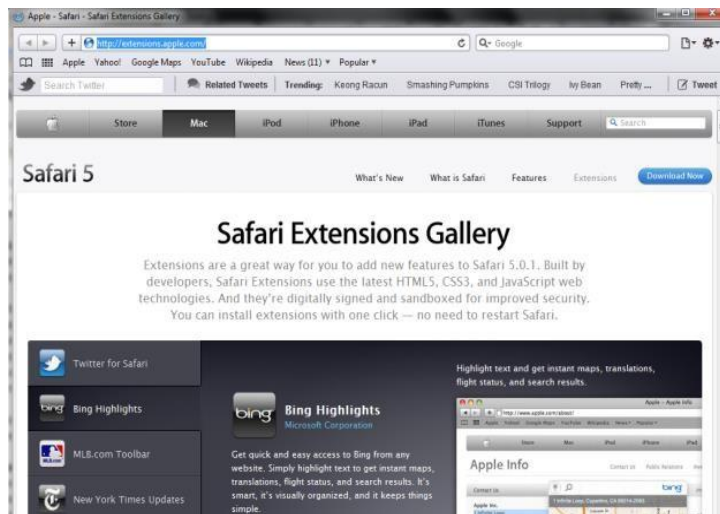
Performance:

With a blazing-fast JavaScript engine, Safari is the world's fastest browser. It's developed to run specifically on Apple devices, so it's geared to make the most out of the battery life and deliver long-lasting power. And now with Apple silicon, it's even faster than ever before.

4K Video Streaming:

Safari now supports in browser 4K HDR video playback for YouTube, Netflix and Apple TV+. And it runs efficiently for longer-lasting battery life. With macOS Big Sur, which is currently available as a beta developer, MAC users can finally watch Movies and TV shows on Netflix in 4K resolution. It also works with Dolby Vision and HDR10, which delivers more brilliant and vivid colors.

Privacy:

Privacy is built in Online privacy isn't just something you should hope for it's

something you should expect. That's why Safari comes with industry-leading privacy protection technology built in, including Intelligent Tracking Prevention that identifies trackers and helps prevent them from profiling or following you across the web.

Security:

Explore the web knowing that strong security protections in Safari help keep you safe. Like iCloudKeychain, which securely stores and auto fills your passwords across all your devices. If a password breach is detected, Password Monitoring alerts you. Safari also notifies you when it encounters suspicious websites and prevents them from loading. And because it loads each web page in a separate process, any harmful code is always confined to a single browser tab so it won't crash the entire application or access your data.

Continuity:

Safari works seamlessly and syncs the passwords, bookmarks, history, tabs and more across Mac, iPad, iPhone and Apple Watch. When your Mac, iOS or iPadOS devices are near each other, they can automatically pass what you're doing in Safari from one device to another using Handoff. You can even copy images, video or text from Safari on your iPhone or iPad, then paste into another app on your nearby Mac or vice versa.

38. SELFIE TECHNICAL FEATURES

Introduction:

A selfie is a self-portrait photograph, typically taken with a digital camera or smartphone, which may be held in the hand or supported by a selfie stick. Selfies are often shared on social media, via social networking services such as Facebook, Twitter, Snapchat, and Instagram.

Popularity:

Although the widespread use of the term is fairly new, photos in the selfie genre have existed for much longer. Selfie culture became popular in Japan and then other East Asian countries in the 1990s, starting with both and then front-facing camera phones. However, it was not until the 2000s that selfie culture was popularized outside of East Asia.

Selfies have been popular on social media. Instagram has over 53 million photos tagged with the hashtag #selfie. The word "selfie" was mentioned in Facebook status updates over 368,000 times during a one-week period in October 2013. During the same period on Twitter, the hashtag #selfie was used in more than 150,000 tweets.

The pop-up museum called the Museum of Selfies. The Museum of Selfies is an interactive pop-up museum that explores the history and cultural phenomenon of the selfie with historical roots dating back 40,000 years to the first depiction of human art.
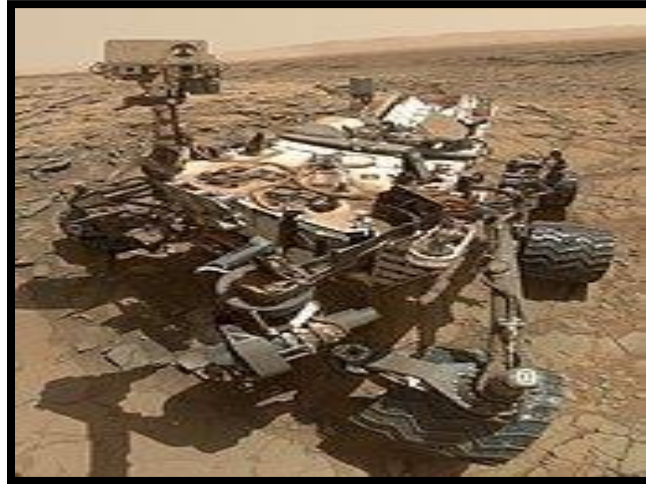
Psychology and Neuroscience:

According to a study performed by Nicola Bruno and Marco Bertamini at the University of Parma, selfies by non-professional photographers show a slight bias for showing the left cheek of the selfie-taker. This is similar to observations of portraits by professional painters from many historical periods and styles, indicating that the left cheek bias may be rooted in asymmetries of brain lateralization that are well documented within cognitive neuroscience. In a second study, the same group tested if selfie takers without training in photography spontaneously adhere to widely prescribed rules of photographic composition, such as the rule of thirds. It seems that they do not, suggesting that these rules may be conventional rather than hardwired in the brain's perceptual preferences.

Facial distortion effect :

When conventional photographers take head shots, they typically use a narrower lens (or zoom in) and stand at a normal distance, instead of getting physically closer to the subject's face. Front-facing cell phone cameras, on the other hand, feature wide-angle lenses and are held closer to the face, since the human arm is only so long. This results in extension distortion, where objects closer to the camera appear much larger than they actually are. Though this distortion has a slimming effect, it also exaggerates the auto-photographer's nose and chin, since those parts are closer to the camera than the rest of the face.

39. SHRDLU IN ARTIFICIAL INTELLIGENCE

Introduction:

SHRDLU was an early natural language understanding computer program, developed by Terry Winograd at MIT in 1968–1970. In the program, the user carries on a conversation with the computer, moving objects, naming collections and querying the state of a simplified "blocks world", essentially a virtual box filled with different blocks.

Functionality:

SHRDLU was primarily a language parser that allowed user interaction using English terms. The user instructed SHRDLU to move various objects around in the "blocks world" containing various basic objects: blocks, cones, balls, etc. What made SHRDLU unique was the combination of four simple ideas that added up to make the simulation of "understanding" far more convincing.

One was that SHRDLU's world was so simple that the entire set of objects and locations could be described by including as few as perhaps 50 words: nouns like "block" and "cone", verbs like "place on" and "move to", and adjectives like "big" and "blue". The possible combinations of these basic language building blocks were quite simple, and the program was fairly adept at figuring out what the user meant.
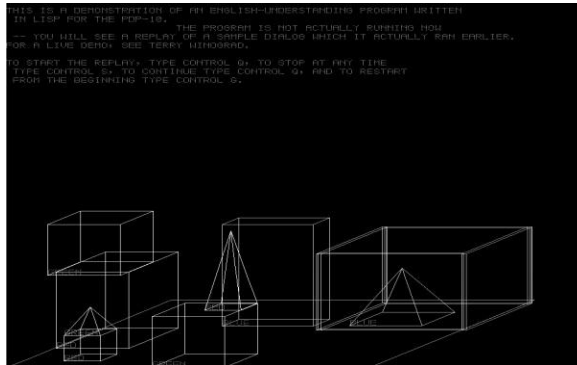
Working:

SHRDLU also included a basic memory to supply context. One could ask SHRDLU to "put the green cone on the red block" and then "take the cone off"; "the cone" would be taken to mean the green cone one had just talked about. SHRDLU could search back further through the interactions to find the proper context in most cases

when additional adjectives were supplied. One could also ask questions about the history, for instance one could ask "did you pick up anything before the cone?"

A side effect of this memory, and the original rules SHRDLU was supplied with, is that the program could answer questions about what was possible in the world and what was not. For instance, SHRDLU would deduce that blocks could be stacked by looking for examples, but would realize that triangles couldn't be stacked, after having tried it.

Example:

Person: Pick up a big red block.

Computer: OK.

Person: Grasp the pyramid.

Computer: I DON'T UNDERSTAND WHICH PYRAMID YOU MEAN.

Person (changing their mind): Find a block which is taller than the one you are

holding and put it into the box.

Computer: BY "IT", I ASSUME YOU MEAN THE BLOCK WHICH IS

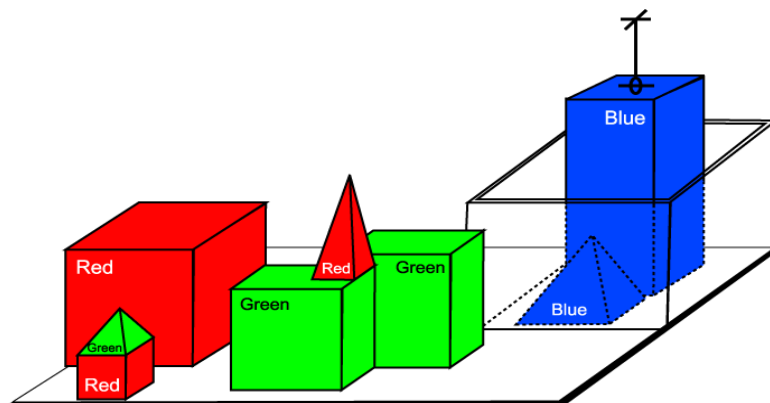TALLER THAN THE ONE I AM HOLDING.

Computer: OK.

Person: What does the box contain?

Computer: THE BLUE PYRAMID AND THE BLUE BLOCK.

Person: What is the pyramid supported by?

Computer: THE BOX.

40. SPEECH INTERPRETATION AND RECOGNITION INTERFACE

Siri:

Siri supports a wide range of user commands, including performing phone actions, checking basic information, scheduling events and remainders, handling device settings, searching the internet, navigating areas, finding information on entertainment, and is able to engage with IOS-integrated apps.

Siri's original release on IPhone4S in 2011 received mixed reviews. It received praise for its voice recognition and contextual knowledge of user information.

Development:

Siri is a spin-out from the SRI International Artificial intelligence center, and is an offshoot of the US Defense Advanced Research Project's Agency's (DARPA)-funded CALO project.

Features and options:

Apple offers a wide range of voice commands to interact with Siri, including, but not limited to:

- Phone and Text actions, such as "Call Sarah", "Read my new messages".
- Check basic information, including "What's the weather like today?"
- Handle device settings, such as "Take a picture", "Turn off WI-FI and increase the device brightness."

- Navigation including "Take me to home", "what's traffic like on the way home?"

Reception:

The amount of times Siri hasn't been able to understand and execute my request is astonishingly low… Just imagine what will happen when Apple partners with other services to expand Siri further. And imagine when they have an API that any developer can use. This really could after the mobile landscape.

Perceived lack of innovation:

"What Apple didn't talk about was solving Siri's biggest, more basic flaws: It's still not very good at voice recognition, and when it gets it right, the Results are often clunky. And these problems look even worse when you Consider that Apple now has full-fledged competitors in this space: Amazon's Alexa, Microsoft's Cortana and Google's Assistant."
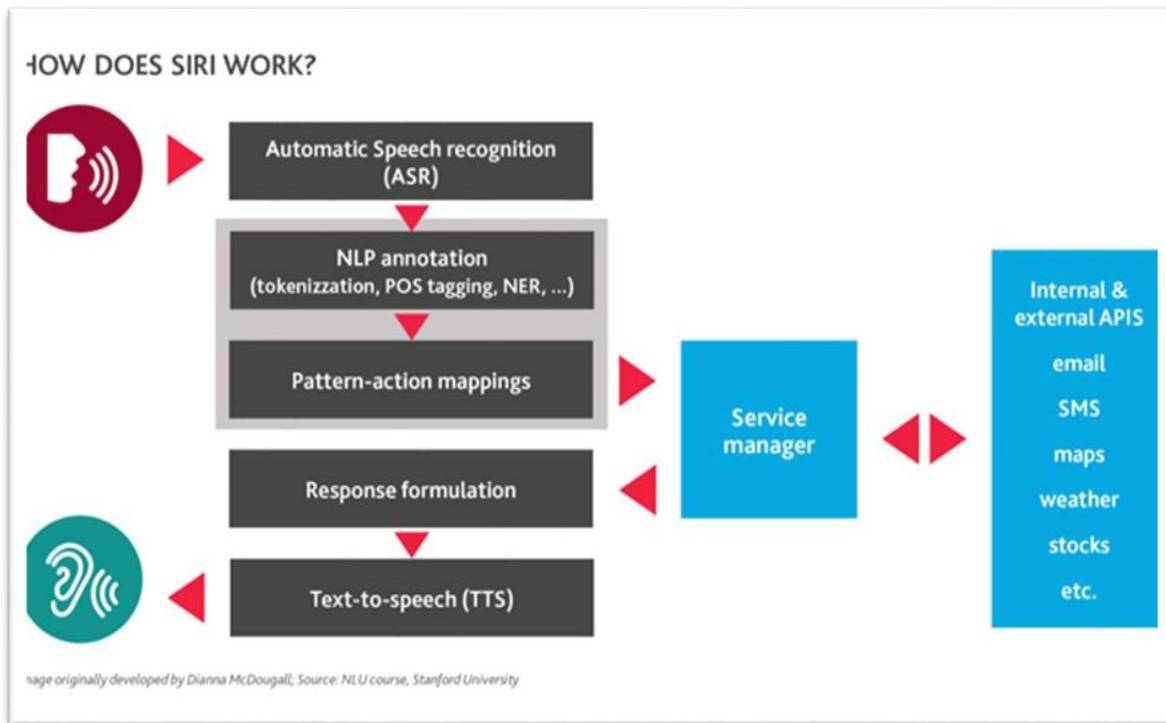
We express our sincere Gratitude for all those who have helped us, for the successful launch of this book, which is one of the *B*est *P*ractices of our Department....