CTC(T&IT),CRPF

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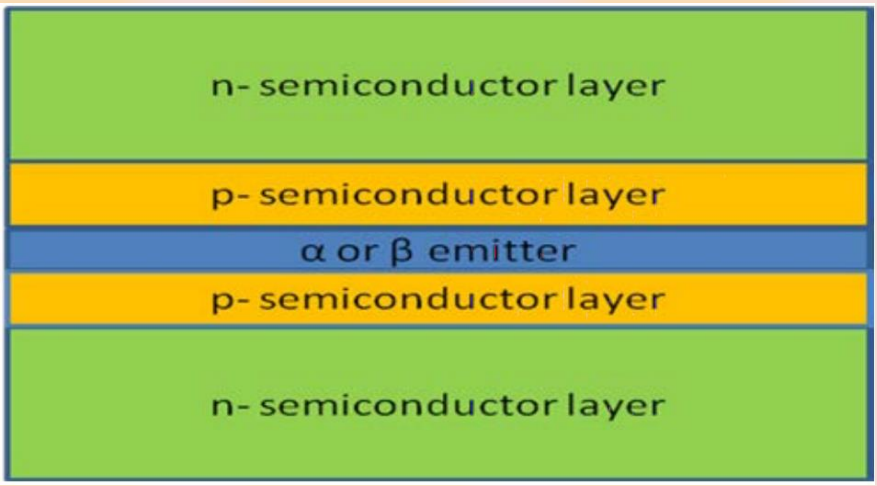
DIAMOND BATTERIES

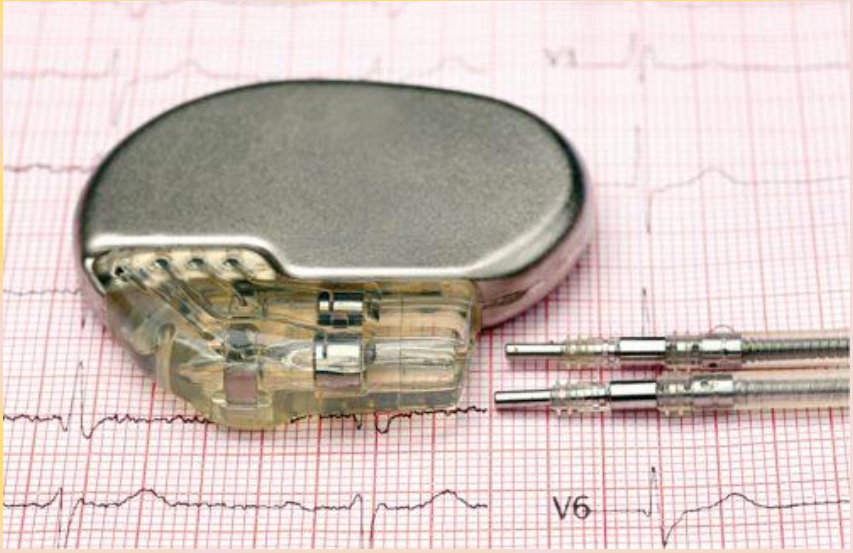
Diamond batteries, or Beta voltaic batteries, generate electricity as long as they are in radioactive fields where they can receive beta rays from isotopes such as carbon-14 and nickel-63. These batteries have such long lives because the carbon-14 and nickel-63 decay by half in roughly 5,700 and 100 years respectively



The α or β radiation from the isotope creates electron pair holes in the semiconductor, pulling the electrons in between the semiconductor to generate small amounts of current as seen in Fig.

Theoretical Process

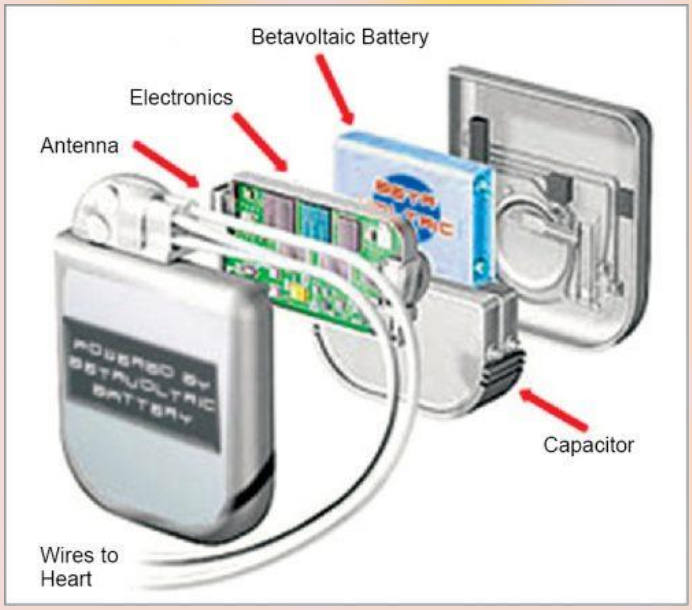
One of the largest nuclear waste products by volume is radioactive carbon-14 which is produced by irradiation of graphite blocks used in graphite-moderated reactors. The radioactive C-14 could theoretically then be extracted and compressed into radioactive diamonds. These diamonds would then be incased in a regular, non-radioactive diamond, to provide shielding.



The radioactive C-14 gets concentrated at the surface of these blocks, from where it is extracted and fused into a diamond to produce a nuclear-powered diamond. This is encapsulated in an artificial diamond to ensure safe containment of the radiation. The lifetime of diamond batteries far exceeds the life of conventional batteries as the half-life of C-14 is as many as 5,730 years. Diamond batteries, which are highly durable, provide charge for thousands of years and serve well as a low-voltage energy source. There are several low-voltage devices like

pacemakers, satellites, and space probe components that cannot be easily accessed for replacement of their batteries.

Diamond batteries do not provide power directly to attached devices but are designed with a capacitor that gets 'trickle charged' by the battery and then discharges to power the devices at set intervals.



A Beta voltaic battery powering a pacemaker

Conclusion

The nuclear-based radioactive isotopes batteries involve no moving parts, zero maintenance, and just direct and continuous electricity generation.

The power output of these diamond batteries is low as compared to other alternatives. However, their total longevity favours them to become critical components of future electronics manufacturing. By encapsulating radioactive materials inside diamonds, it is possible to turn a long-term serious problem of nuclear waste management into a nuclear-powered battery for a long-term supply of clean energy.

Automation

What Does Automation Mean?

Automation is the creation and application of technologies to produce and deliver goods and services with minimal human intervention. The implementation of automation technologies, techniques and processes improve the efficiency, reliability, and/or speed of many tasks that were previously performed by humans.

Automation is being used in a number of areas such as manufacturing, transport, utilities, defense, facilities, operations and lately, information technology.

Usually, automation is employed to minimize labor or to substitute humans in the most menial or repetitive tasks. Automation is present in virtually all verticals and niches, although it's more prevalent in manufacturing, utilities, transportation, and security.

For example, most manufacturing plants make use of some automated process in the form of robotic assembly lines. Human input is required only to define the processes and supervise them, while the assembling of the various components is left to the machines, which automatically convert raw materials into finished goods.

In the technology domain, the impact of automation is increasing rapidly, both in the software/hardware and machine layer. The implementation of new artificial intelligence (AI) and machine learning (ML) technologies is currently skyrocketing the evolution of this field.

In the information technology domain, a software script can test a software product and produce a report. There are also various software tools available in the market which can generate code for an application. The users only need to configure the tool and define the process.

Advanced business intelligence in applications is another new form of high-quality automation. In other industries, automation has greatly improved productivity in the last decades, saving time and cutting costs.

From the simplest to the most complex application, automation is present in many forms in our everyday life. Common examples include household thermostats controlling boilers, the earliest automatic telephone switchboards, electronic navigation systems, or the most advanced algorithms behind self-driving cars.

Automation will certainly have substantial negative effects on employment and wages for all those occupations that do not require particular training or skills. However, many of these employees could be easily retrained in new jobs, and the impact of this technology on our society is revolutionary enough to create new opportunities for everyone.

Despite advances in automation, some manual intervention is always advised, even if the tool can perform most of the tasks. Automation professionals involved in the creation, application, and monitoring of such technologies are in high demand.

Internet of Behaviors (IoB)

The collection and use of data to drive behaviors is called the ***Internet of Behaviors (IoB)***. An example of it is industrial sites having employed computer vision to determine if employees were complying with mask protocol and then collecting this behavioral data to be analyzed by the organizations to influence people to follow government protocols at work.

IoB can gather, combine and process data from many sources including:

- Citizen data processed by public-sector
- Commercial customer data
- Government agencies
- Social media
- Public domain
- Location tracking.

The increasing sophistication of the technology that processes this data has enabled this trend to grow.

Companies investing in IoB: AWS, Cisco, SAP, Microsoft, HP, IBM, Dell, Cloudera

IT ACT 2000 AND ITAA 2008

We always talk about the crimes of variety in the news channel and other means of social media . Most of the people known about the Indian penal codes dealing with criminal cases and the crimes of different category but few of the personnel known about the articles dealing with crimes over internet even the most of the force personnel also. I am about to giving a simple touch of these articles which are ruling over the crimes of different category over the internet.

What is ITA - 2000 ?

The Information Technology Act, 2000 or ITA, 2000 or IT Act, was notified on October 17, 2000. It is the law that deals with cybercrime and electronic commerce in India. In this article, we will look at the objectives and features of the Information Technology Act, 2000 and some of the important amendments under which Govt. of India did some important revolutions in recent past in the country.

The bill was passed in the budget session of 2000 and signed by President K. R. Narayanan on 9 June 2000. The bill was finalized by a group of officials headed by then Minister of Information Technology Pramod Mahajan.

The original Act contained 94 sections, divided into 13 chapters and 4 schedules. The laws apply to the whole of India. If a crime involves a computer or network located in India, persons of other nationalities can also be indicted under the law

Objectives of ITA 2000 :-

The Information Technology Act, 2000 provides legal recognition to the transaction done via electronic exchange of data and other electronic means of communication or electronic commerce transactions.

The Act provides a legal framework for electronic governance by giving recognition to electronic records and digital signatures. It also defines cyber crime and prescribes penalties for them. The Act directed the formation of a Controller of Certifying Authorities to regulate the issuance of digital signatures. It also established a Cyber Appellate Tribunal to resolve disputes rising from this new law.

Salient features:-

The salient features of The IT Act, 2000 are as follows − Digital signature has been replaced with electronic signature to make it a more technology neutral act. It elaborates on offenses, penalties, and breaches. It outlines the Justice Dispensation Systems for cyber-crimes.

Amendments :-

A major amendment was made in 2008. It introduced Section 66A which penalized sending "offensive messages". It also introduced Section 69, which gave authorities the power of "interception or monitoring or decryption of any information through any computer resource". Additionally, it introduced provisions addressing - pornography, child porn, cyber terrorism and voyeurism. The amendment was passed on 22 December 2008 without any debate in Lok Sabha. The next day it was passed by the Rajya Sabha. It was signed into law by President Pratibha Patil, on 5 February 2009

Important sections and their descriptions.

Sections	Offences	Penalties
65	Tampering with computer source documents	Imprisonment up to three years, or/and with fine up to ₹200,000
66	Hacking with computer system	Imprisonment up to three years, or/and with fine up to ₹500,000
66B	Receiving stolen computer or communication device	Imprisonment up to three years, or/and with fine up to ₹100,000
66C	Using password of another person	Imprisonment up to three years, or/and with fine up to ₹100,000
66D	Cheating using	Imprisonment up to three years, or/and with fine up

	computer resource	to ₹100,000
66E	Publishing private images of others	Imprisonment up to three years, or/and with fine up to ₹200,000
66F	Acts of cyberterrorism	Imprisonment up to life.
67	Publishing information which is obscene in electronic form.	Imprisonment up to five years, or/and with fine up to ₹1,000,000
67A	Publishing images containing sexual acts	Imprisonment up to seven years, or/and with fine up to ₹1,000,000
67B	Publishing child porn or predating children online	Imprisonment up to five years, or/and with fine up to ₹1,000,000 on first conviction. Imprisonment up to seven years, or/and with fine up to ₹1,000,000 on second conviction.
67C	Failure to maintain records	Imprisonment up to three years, or/and with fine.
68	Failure/refusal to comply with orders	Imprisonment up to 2 years, or/and with fine up to ₹100,000
69	Failure/refusal to decrypt data	Imprisonment up to seven years and possible fine.
70	Securing access or attempting to secure access to a protected system	Imprisonment up to ten years, or/and with fine.
71	Misrepresentation	Imprisonment up to 2 years, or/and with fine up to ₹100,000
72	Breach of confidentiality and privacy	Imprisonment up to 2 years, or/and with fine up to ₹100,000
72A	Disclosure of information in breach of lawful contract	Imprisonment up to 3 years, or/and with fine up to ₹500,000
73	Publishing electronic signature certificate false in certain particulars	Imprisonment up to 2 years, or/and with fine up to ₹100,000
74	Publication for fraudulent purpose	Imprisonment up to 2 years, or/and with fine up to ₹100,000

Some notable cases on ITA and ITAA sections :-

1. Section 66

(a) In February 2017, M/s Voucha Gram India Pvt. Ltd, owner of Delhi based Ecommerce Portal www.gyftr.com made a Complaint with Hauz Khas Police Station against some hackers from different cities accusing them for IT Act / Theft / Cheating / Misappropriation / Criminal Conspiracy / Criminal Breach of Trust / Cyber Crime of Hacking / Snooping / Tampering with Computer source documents and the Web Site and extending the threats of dire consequences to employees, as a result four hackers were arrested by South Delhi Police for Digital Shoplifting.

2. Section 66 A

(a) On 30 October 2012, a Puducherry businessman Ravi Srinivasan was arrested under Section 66A. He had sent tweet accusing Karti Chidambaram, son of then Finance Minister P. Chidambaram, of corruption. Karti Chidambaram had complained to the police.

Section 66A and restriction of free speech

From its establishment as an amendment to the original act in 2008, Section 66A attracted controversy over its unconstitutional nature:

Offence :-Publishing offensive, false or threatening information. This section describes if Any person who sends by any means of a computer resource any information that is grossly offensive or has a menacing character; or any information which he knows to be false, but for the purpose of causing annoyance, inconvenience, danger, obstruction, insult shall be punishable with imprisonment for a term which may extend to three years and with fine

In December 2012, P Rajeev, a Rajya Sabha member from Kerala, tried to pass a resolution seeking to amend the Section 66A. He was supported by D. Bandyopadhyay, Gyan Prakash Pilania, Basavaraj Patil Sedam, Narendra Kumar Kashyap, Rama Chandra Khuntia and Baishnab Charan Parida. P Rajeev pointed that cartoons and editorials allowed in traditional media, were being censored in the new media. He also said that law was barely debated before being passed in December 2008.

Rajeev Chandrasekhar suggested the 66A should only apply to person to person communication pointing to a similar section under the Indian Post Office Act, 1898. Shantaram Naik opposed any changes, saying that the misuse of law was sufficient to warrant changes. Then Minister for Communications and Information

Technology Kapil Sibal defended the existing law, saying that similar laws existed in US and UK. He also said that a similar provision existed under Indian Post Office Act, 1898. However, P Rajeev said that the UK dealt only with communication from person to person.

Strict data privacy rules

The data privacy rules introduced in the Act in 2011 have been described as too strict by some Indian and US firms. The rules require firms to obtain written permission from customers before collecting and using their personal data. This has affected US firms which outsource to Indian companies. However, some companies have welcomed the strict rules, saying it will remove fears of outsourcing to Indian companies.

Section 69 and mandatory decryption.

The Section 69 allows intercepting any information and ask for information decryption. To refuse decryption is an offence. The Indian Telegraph Act, 1885 allows the government to tap phones. But, according to a 1996 Supreme Court verdict the government can tap phones only in case of a "public emergency". But, there is no such restriction on Section 69.[4] On 20 December 2018, the Ministry of Home Affairs cited Section 69 in the issue of an order authorising ten central agencies to intercept, monitor, and decrypt “any information generated, transmitted, received or stored in any computer.” [36] While some claim this to be a violation of the fundamental right to privacy, the Ministry of Home Affairs has claimed its validity on the grounds of national security.

Section 69A and banning of mobile apps

(a) On 29 June 2020, the Modi government banned 59 Chinese mobile apps, most notably TikTok, supported by Section 69A and citing national security interests.

(b) On 24 November 2020, another 43 Chinese mobile apps were banned supported by the same reasoning, most notably AliExpress.

The bans on Chinese apps based on Section 69A has been criticized for possibly being in conflict with Article 19(1)(a) of the Constitution of India ensuring freedom of speech and expression to all, as well as possibly in conflict with WTO agreements. The Internet Freedom Foundation has criticized the ban for not following the required protocols and thus lacking transparency and disclosure.

Importance of the Information Technology Act

The Indian government closely connects data to citizens' privacy and this is demonstrated when Shiv Shankar Singh states, "Each person must be able to exercise a substantial degree of control over that data and its use. Data protection is legal safeguard to prevent misuse of information about individual person on a medium including computers

The Personal Data Protection Bill 2019 (PDP Bill 2019) was tabled in the Indian Parliament by the Ministry of Electronics and Information Technology on 11 December 2019. As of March, 2020 the Bill is being analyzed by a Joint Parliamentary Committee (JPC) in consultation with experts and stakeholders. The JPC, which was set up in December, 2019, is headed by BJP Member of Parliament (MP) Meenakshi Lekhi. While the JPC was tasked with a short deadline to finalize the draft law before the Budget Session of 2020, it has sought more time to study the Bill and consult stakeholders.

The Bill covers mechanisms for protection of personal data and proposes the setting up of a Data Protection Authority of India for the same. Some key provisions the 2019 Bill provides for which the 2018 draft Bill did not, such as that the central government can exempt any government agency from the Bill and the Right to Be Forgotten, have been included.

In July 2017, the Ministry of Electronics and Information Technology set up a committee to study issues related to data protection. The committee was chaired by retired Supreme Court judge Justice B. N. Srikrishna. The committee submitted the draft Personal Data Protection Bill, 2018 in July 2018. After further deliberations the Bill was approved by the cabinet ministry of India on 4 December 2019 as the Personal Data Protection Bill 2019 and tabled in the Lok Sabha on 11 December 2019.

Criticism of PDP bill 2019

The revised 2019 Bill was criticized by Justice B. N. Srikrishna, the drafter of the original Bill, as having the ability to turn India into an “Orwellian State". In an interview with Economic Times, Srikrishna said that, "The government can at any time access private data or government agency data on grounds of sovereignty or public order. This has dangerous implications.

Crimes in Cyber will destroy the life but COVID will destroy the entire live. So stay home , use masks and hand sanitizers, maintain social distance for the sake of self as well as others.

Edge Computing

Formerly a new technology trend to watch, cloud computing has become mainstream, with major players AWS (Amazon Web Services), Microsoft Azure and Google Cloud Platform dominating the market. The adoption of cloud computing is still growing, as more and more businesses migrate to a cloud solution. But it's no longer the emerging technology trend. Edge is.

As the quantity of data organizations are dealing with continues to increase, they have realized the shortcomings of cloud computing in some situations. Edge computing is designed to help solve some of those problems as a way to bypass the latency caused by cloud computing and getting data to a datacenter for processing. It can exist "on the edge," if you will, closer to where computing needs to happen. For this reason, edge computing can be used to process time-sensitive data in remote locations with limited or no connectivity to a centralized location. In those situations, edge computing can act like mini datacenters.

Virtual Reality and Augmented Reality

The next exceptional technology trend - Virtual Reality (VR) and Augmented Reality (AR), and Extended Reality (ER). VR immerses the user in an environment while AR enhances their environment. Although this technology trend has primarily been used for gaming thus far, it has also been used for training, as with Virtual Ship, a simulation software used to train U.S. Navy, Army and Coast Guard ship captains.

In 2021, we can expect these forms of technologies being further integrated into our lives.

While some employers might look for optics as a skill-set, note that getting started in VR doesn't require a lot of specialized knowledge - basic programming skills and a forward-thinking mindset can land a job; another reason why this new technology trend should make up to your list of lookouts!

Abbreviations

•DNS - This stands for Domain Name Server; this can help recognize an IP address used by a domain name.

•FTP - This is a service called File Transport Protocol, which moves a file between computers using the Internet.

•IP - This stands for Internet Protocol which is the set of rules that govern the systems connected to the Internet. IP Address is a digital code specific to each computer that is hooked up to the Internet.

•LAN - This stands for Local Area Network, which consists of the servers that your computer connects to in your local area.

•SEO - This is an acronym for Search Engine Optimization.

•USB - The Universal Serial Bus is used for communications between certain devices. It can connect keyboards, cameras, printers, mice, flash drives, and other devices. Its use has expanded from personal computers to smartphones and video games, and is used as a power cord to connect devices to a wall outlet to charge them.

•VR - Virtual Reality simulates a three-dimensional scene on the computer and has the capability of interaction. This is widely used in gaming.

•VRML - Virtual Reality Mark-up Language allows the display of 3D images.

•WYSIWYG - This initialism stands for What You See Is What You Get. It is pronounced "wizziwig" and basically means that the printer will print what you see on your monitor. It also describes web design programs where what you see in the program is how the website will appear to the end user.

•BYOC - This stands for Bring Your Own Cloud, often referring to cloud-based file-sharing software.

•IaaS - This acronym stands for Infrastructure as a Service. It means a service that provides data storage and servers remotely for clients.

•SaaS - This stands for Software as a Service and refers to on-demand software stored in the cloud.

•ASR - This stands for Automatic Speech Recognition and refers to computers' ability to understand your speech.

Quiz

1) How many computer languages are in use?

A) 2000 B) 5000 C) 50 D) 20

2) Which of these is not a kind of computer?

A) Apple B) Lenovo C) Toshiba D) Lada

3) Who invented flexible photographic film?

A) Leonardo da Vinci B) Linda Eastman C) Louis Daguerre D) George Eastman

4) Which of these is a file format for digital images?

A) CIA B) JPG C) ICBM D) IBM

5) When was the DVD introduced?

A) 1970 B) 1990 C) 2000 D) 1995

6) Which of these is not a telephone?
A) Ipod B) Razr C) Blackberry D) Iphone

7) Who was responsible for some of the earliest, widely influential development of military rockets?
A) Elon Musk B) Hermann Oberth C) William Congreve D) Robert Hutchings Goddard

8) A dual layer Blue-ray Disc can store data upto
(a) 20GB (b) 35 GB (c) 12 GB (d) 50 GB

9) First computer virus is known as
(a) Rabbit (b) Creeper Virus (c) Elk Cloner (d) SCA Virus

10) Where is the headquter of Microsoft office located

(a) Texas (b) NewYork (c) California (d) Washington

Acknowledgement

We are highly thankful for reading out this compilation and hope it will be useful for you in our day to day professional and personal life. We would like to hear your interest areas, suggestions from you to make this newsletter more informative and interesting. Your views will definitely help us to create this newsletter as an effective medium to reach you with latest development in the fields of communication and technology.

1	2	3	4	5	6	7	8	9	10
A	D	D	B	D	A	C	D	B	D

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