ভাৰতীয় জনতা পার্টি, অসম প্রদেশ
তথ্য প্রযুক্তি বিভাগৰ নিবেদন
ডিজিটেল পাঠশালা
২০২১
এক প্রশিক্ষণ মহাঅভিযান।

বিৰামহীন কার্যসূচীৰে লক্ষ্য আমাৰ
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INTRODUCTION

On behalf of IT CELL, BJP ASSAM PRADESH, a workshop named "DIGITAL PATHSALA" is held on 7 January 2021. This is a booklet containing some basic knowledge of Information Technology in modern era. With this booklet a person can learn many technical keywords that are usable in our daily life for both political and personal purposes. This booklet is written by Bipul Kalita(M.Sc. In CS, IT CELL, BJP ASSAM PRADESH) and Deep Jyoti Lahkar(M.Sc. In IT, IT CELL ,BJP ASSAM PRADESH). We, IT CELL, BJP ASSAM PRADESH hope that this booklet will help you in many ways.

"It's not just information, It's about how you present it." - Bipul kalita

"Information Technology has the potential to change the society and that's happening." - Deep Jyoti Lahkar

"We build technology and technology teaches us" - Amitabh Bhattacharjee

"Technology by itself does not make leaders. Technology only amplifies true leadership" - Biswajit Das

Information Technology is not a new subject. It's been here since the dawn of civilization, from petroglyph to Facebook, the only changing concept is the Innovation. From Invention of Mechanical Computer to digital Computer also not to forget the new upcoming Quantum era. With Increasing the speed of information sharing and expanding the network that connects us, Information Technology is holding its exponential curve. 100 years ago people could not think about a Smart Phone but Smart Phone is not a surprise now, from now, 100 years ahead we could not think about the upgrade in Information Technology, But it's been upgrading day by day, with each clock tick. We the people of the earth are the massive source that moving the Information Technology forward.

The main AIM of this booklet is to provide some knowledge that may be basic but these are some roots that help to grow the information Technology.

WHY TO LEARN SOME KEY CONCEPT?

Let's take an example. Suppose someone is asking you to record a video session and also send it through the Internet. Let's consider the duration is 1 hour. Now, after you have recorded the video, you have noticed that the file size is too big and you don't have much time and Internet Quota to send it, since it's a big file. Now your problem is to reduce the video file size without much loss of quality. For that you should have some knowledge about Video container format, compression technique and the resolution and then apply those to solve the issue.

Again, if you want to design a poster which will be very big in size(canvas size) then you should have a knowledge about the Image resolution, Pixel depth, photo format etc for the best result.

So, we can see that, in many areas we need some basic knowledge of Information Technology(specially the digital) to have a perfection in our work. So, we have gathered some of those, Hope you will enjoy it.

CONTENTS

1. INTRO TO DIGITAL ERA

As mentioned in the introduction part, Information Technology is not a new concept. But there have been many eras from Pre-mechanical age to Digital. We often use the term "Data" and "Information", DATA can be a set of values, symbols, but adding a meaning to that DATA is called the Information. And innovation of that information is the Information Technology or more precisely we can say, Information Technology is the innovation used to store, control, transmit or make data.

Let's skip some stages (era) of Information Technology and directly come to the Digital era, which is the current stage of IT. In this era or we can say in this technology, information are represented in a discontinuous or discrete manner. More specifically it can be said that in digital technology information are represented in 1 and 0. yes, it's called a binary system. Like we have decimal system from 0 to 9. so any information can be converted to a series of 1 and 0. whether it can be your name, address etc. For example, an Assamese letter "ক" can be represented in binary like this-

ক = 111000001010011010010101

this series of 1 and 0 is a digital data and the information- it's a UTF-8 encoding of a Unicode glyph.

Now, this is very hard for us, as human we can't remember this big series of 1 and 0. But for some machines(digital devices) it's very easy job to store these type of information and also they can process them very quickly. And these devices are very known to us, they are – your smartphone, a calculator, a personal computer, a smart watch, smart TV etc. These machines can process and store those digital information, so we can say that they are digital devices. Now the mechanisms of how they store or process those digital information and when these devices are invented etc, are different and large topic and out of scope for this booklet. For more information you can use the Internet or read some books. The Aim of this booklet is to introduce about this digital technology.

2. DIGITAL MEMORY

We human can memorize information with our neurons. But a Digital storage device can store digital Data with the help of electricity and some transistor switching circuits or can be a mechanical magnetic drive. But How much Data?

We can measure the amount of data with some units. First we should know about the possible minimum amount data which is either 0 or 1, these are called "bit". A bit can be either 0 or 1. In Binary -

a bit(b) = 0 or 1

1 byte(B) = 8 bits

1 Kilobyte(KB) = 1024 bytes

1 Megabyte(MB) = 1024 Kilobytes

1 Gigabyte(GB) = 1024 Megabytes

1 Terabyte(TB) = 1024 Gigabytes

etc.

Now, you can calculate how many 1 and 0 in a 4MB MP3 file.

The more the capacity of storage and the speed of accessing data, the more you have to pay for the storage device. So these devices can be categorized in terms of speed and capacity. For example, If you replace your hard disk drive(HDD) with a solid state disk(SDD) then your machine(computer) will gain more speed. In general, The more the size of a file the more your machine will need time to process it. A 5MB image will need more time to render in your device's display than a 100KB image.

3. THE NETWORK OF NETWORKS(INTERNET)

The Internet is a big deal in Information Technology. We can store information locally, now we want to share it. There are other ways without using the Internet for sharing data, but those will be time consumable and very inconvenient . A group of machines can be connected with some protocols using wire or wireless medium calling it a "Network". For example- all personal computers, cameras, printers are connected trough a LAN in a office. Now there will be many offices in a town. And those offices can be connected using another network for the communications between them. And like this, a country is connected with another country using a network. So, this is the Internet, Network of Networks.

It's not free, and it costs more with more the speed and bandwidth. Some important keywords -

IP Address: like you have a unique mobile number, if you are connected to a network, then you will have an unique address too called IP address. But like mobile number, in general, an IP(Internet Protocol) changes each time you are connected to the Internet(a simple example:- when you turn on your Data in smartphone), but it can be static too which is costlier. These IP addresses have types in terms of addressing users- IPV4 and IPV6. An example of IPV4 is 192.168.43.120

Domain Name: Now, it's hard for us to remember the IP address. It's better to use a name which refers to an IP address. So, an example is – "google.com" (domain name) refers to an IP "172.217.14.206", instead of typing google.com, you can type the IP address too in your web browser.

Bandwidth: How many bits can be transferred in a second. Usually calculated in Megabits per second or written as Mb/s. You have to be careful here, it's not , megaBYTE, it's megaBIT, which is a smaller unit than MB. So don't be surprise if someone tells you that they have a 50Mb connection.

Server and Client: you often hear about server is not working or server is hacked etc. In general a Server is a computer that is connected to a network which provides services. For example, when you open "google.com" in your browser, your machine sends a request to a computer sitting on the Internet which can be in India, USA etc. But that computer has a special function because it will accept your request and send a file which renders on your web browser. Since it serves web pages, it is called a Web server. And your browser is a client.

URL(Uniform Resource Locator): It's an address that tells the computer how to access a specific resource from a server. For example:- "https://www.google.com" tells the browser to access a webpage from that domain(google.com) using HTTPS protocol.

HTTPS Protocol: Stands for Hypertext Transfer Protocol Secure is a rule or can say mechanisms that secures(encrypts) our information on the network while communication. For Websites to use this feature, they have to get a SSL certificate from a trusted Certificate Authority (CA). Using this feature on the WEB, it prevents a hacking technique called "the Man in the middle attack". You can verify a url for https by checking the begining of the link, so http is less secure than https.

4. DIGITAL GRAPHICS

As mentioned earlier, any information can be stored in 1 and 0. so, Images, Videos etc. In our real life objects are in 3 dimensional. But our screens are flat, so we need many information to render a 3D image in our 2d screen.

What is a digital image? : We can say that if some digital data represent an Image. A digital image will hold many information like the number of pixels, value of pixels, compression techniques, color depth etc.

Pixel: It's the smallest cell containing values of color of an image. An image is made up of pixels. Each pixel has a location on a 2D grid.

pixel density or resolution: it's the measurement of how many pixels are contained in an area of the device display or image digitizing device. Generally the unit is Pixels per inch. Higher the value, more the information it can present.

Image size: It is presented as Width x height of the image. Here width and height can be number of pixels or in centimeters etc. Later total number of pixels can be calculated.

Aspect Ratio: It's the proportional ratio of width to height, for example, aspect ratio of a full screen image in a smartphone is normally 9:16 and a laptop has 16:9

RGB value: It's the combination of three colors containing RED (R), GREEN(G) and BLUE (B). each color has an intensity value from 0 to 255. Together RGB can generates many colors.

GRAY SCALE IMAGE: Generally, a pixel of a Color image contains 3 information, intensity of Red, Green, and Blue. If we add these three values and take average then it will represent the intensity of that pixel in a range black to white. 0 represents the darkest and 255 represents the brightest pixel.

ALPHA VALUE: So, an Image contains many information and some are called channel information, like color channel there is an alpha channel which represents the transparency of an image. So it it useful when an image is on top of another image and you want to see through the top one. It is important in logo design.

Canvas size: When you want to create a 2d graphics in computers, then you should mention the width and height of that canvas, also the resolution.

Image Layers: It's not a good idea to add an object or effect etc directly to the original image, Because it will overwrite the old pixels and then you can't modify or change the object or effect. So, it's better to use image layers. So then your original image will be on different layer than your object's layer, and you can modify the layer without affecting the original image. When all work is done, then the final image can be produced.

Image formats: There are many image format, each one has different information and used for different purposes. For example, PNG format can store the information of alpha channel where as a JPEG image can't. A JPEG image has the strong compression algorithm which reduces the image size(memory) better than a PNG image. So, based on the usage , a image format should be chosen. In general More the total number of Pixels, the more that image will occupy memory.

What is a digital video?: Once we understood the digital image then it's easy to understand the video concept. A video is a group of images where each image has a timestamp on a timeline. So, A digital video is inherited from digital image with addition of extra information such as playing speed, total time etc.

Video frame rate: It determines the speed of changing images that are shown on a display. Each frame is an image. It is measured in frames per second(FPS). The higher the FPS, the smoother the video will be and higher the memory size of that video. Also, a High FPS video needs more computing resources and a higher refreshing display. In general, A digital video is a Container having multiple streams such as audio, video, subtitles with each stream having an encoding technique and some metadata.

video container format: It determines what type of streams it can store. For example- matroska [.mkv], MPEG-4 PART 14 [.mp4] etc.

Stream codec: Each stream, audio, video etc. inside a container has a encoding algorithm. For example- audio stream can be in vorbis,AAC etc, Video stream can be in vp9,h.264 etc.

video compression: A digital video can be compressed in terms of memory it occupies using some methods. For example, reducing the each frame size(width x height), changing the encoding format of a stream etc.

Why do we need high end performing devices for Graphics design?: *It's simple, the more the information is and less the time you have to present, then more the powerful computing hardware you'll need. So, Digital images,videos etc holds tremendous amount of information in grids. And the machine have to process each values of each grid concurrently(almost at the same time), so for that, special types of computing hardware is needed, like a Graphics Card will do this work fine.*

SOFTWARE TOOLS: *Although we have knowledge about how things work, but we need to implement them to produce the results. For that we need some Software tools. Since software tools are already made with the actual mechanisms of basic works, we don't need to implement the basic mechanisms, that saves our time and made our job easy. We have chosen some tools for graphics designing, they are open sourced means these are free to share and free to use (nearly almost) and also you can modify them (contribution) and they are well documented and shares all the secrets inside their tools, unlike many proprietary software will not give you that much freedom, And the best thing is, these open sourced software are made by a huge number of people since anyone can modify them and can discuss about a problem and then fix those issues quickly by some other person.*

SCAN THE QR CODE TO GET THE WEBSITE LINK

FOR 2D GRAPHICS
GIMP

FOR LOGO MAKING
INKSCAPE

FOR 3D GRAPHICS
BLENDER

FOR VIDEO EDITING
OPENSHOT

5. INFORMATION TECHNOLOGY ON POLITICS

In this digital era with advancement in information technology, more people are adopting new technologies and it's a part of our life which can't be ignored now. Now almost 60% of population in India have smart phone and just a finger tap away to connect to the Internet. People love to be on Facebook, twitter, Instagram etc. So to spreading a news is very easy. But whether to spread a news or to make a content you should verify so that your content is not fake and check if it's legal to share it.

For example, many people use and share downloaded content from the Internet but it's not legal to share all of those if they are using copyright protected licenses that does not alow you to copy or you may have to follow some rules to share it like giving credits to its owner etc. Also, copyright and privacy both are different things, for example- if you have recorded a video without asking permission then someone may feel unsafe and can file a privacy complaint.

We should also verify our content for correct information from trusted source. Not every news is correct and we can see that some other political parties will always try to propagate misleading information, So what we should do is making people aware about it by indicating those fake news with valid facts. We can try to trace the misleading content to find out the source on the Internet with the help of search engines. For example, an Image can be searched by putting it in a "reverse image search" to find out what other sources are using it.

Rapid Content Creation strategy: *Practices and experiences are the core of this strategy. If you have experience then you already know how to create a content quick and make it awesome. Still, we should follow some working strategies. Strategies like-*

Use reusable components *– Many of our work are same, so why don't we store our previous works and reuse them by only modifying a small change and our new content is ready.*

Use cloud services *– Cloud services like google, Microsoft they offer some free cloud storage and services like producing document file, presentation, excel sheets etc. So that our content is more safe and easily accessible and quickly sharable and also device independent.*

Use online tools *– Even though we can use some high end professional tools that are installed in our machines, we spend times to make our contents and we need good working knowledge to drive those tools. So, sometimes we can use some online services for making contents like graphics design, blog making, Automatic content publishing etc. The big deal of these online tools is that they are on the Internet and works on any web browser from any device also can work from anywhere. You can check them up on the Internet.*

Online Survey: *"How can we win if we don't listen to what people say" . Feedback systems are very important to keep up our work in a right direction of success. We should use it for the good of public. There are many websites that does online survey and we can use those responses to track our work.*

Virtual Meeting: *It was not that much famous before COVID-19, COVID-19 gave us a lesson on how to place meetings without actually being gathered. Many virtual meeting systems were became famous, like Zoom, Cisco webex etc. But even though if the situation is not like COVID-19, we should still use them and through this we can place short duration meetings without having much troubles.*

6. FUTURE OF INFORMATION TECHNOLOGY

What we are seeing today will be history one day. Things are getting smaller, faster and smarter. Communications are taking speed of light . We are now living in a digital era but at the same time some are researching on quantum technology though it is not yet popular but who knows when this will be usable in our daily life.

In both hardware and software people are researching from all over the world. Information technology is a very hot topic, since it has application in almost every field. Companies are trying to build smart processors like neuromorphic computing, trying to producing tiniest electrical components from nano tube technology, automatic driving cars etc.

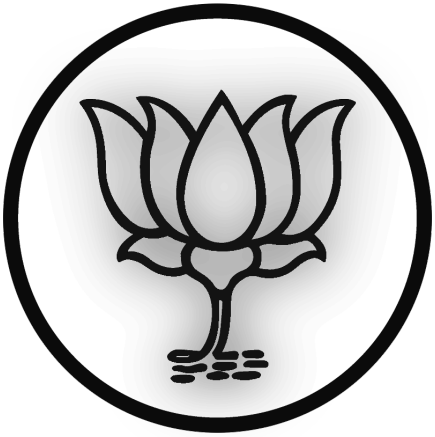
Artificial Intelligence is not new, the main researches were already done before 10 to 30 years ago, but with the high performing computing hardware they are applicable now. These technologies are upgrading fast. Face recognition, voice recognition, language translation, machine generated content, sentiment analysis etc can be seen in many areas.

DIGITAL INDIA movement is a right initiative by BJP Govt. And it is still expanding. Now we can access information on the Internet and Information are more visible to us. Nowadays almost everyone having a smartphone can pay using UPI system, it's so easy, fast and secure. Whether a new scheme is launched by the Govt. Or declare a news , we get it fast.

Information technologies were never stopped and will never be stopping.

As always, It is upgrading day by day, with every clock tick.

THANK YOU FOR READING



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