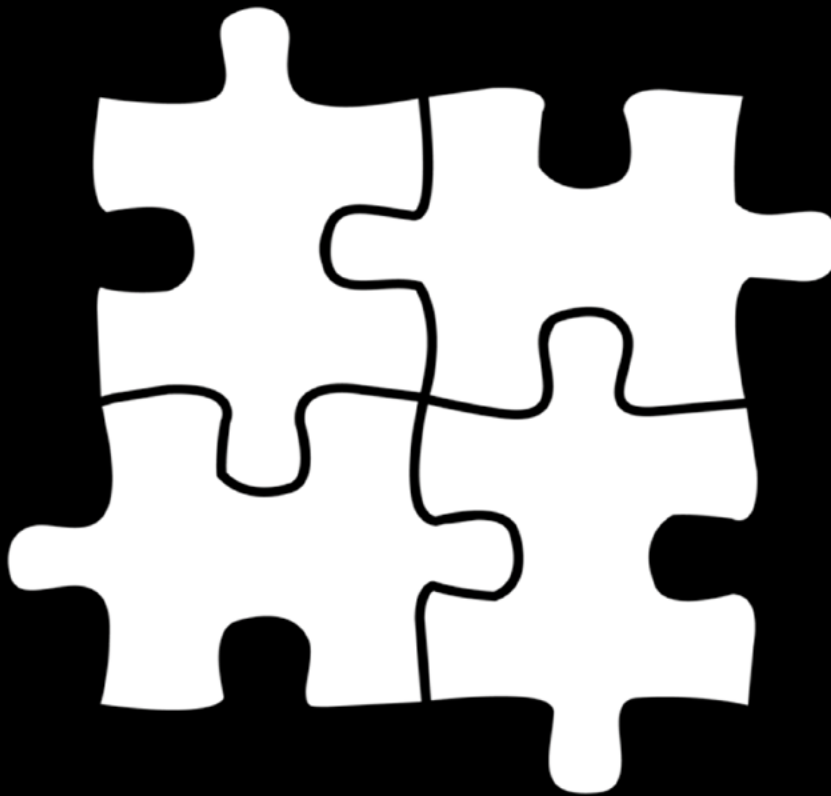# B.I.T.M.A.P.

Boring IT Things Made Accessible to the People

Theme: **Making Trends Meet**

Department of
Information Technology,
St. Xavier's College-Autonomous,
Mumbai-400001.

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Contribution of Digital Natives Towards Education / Learning

Unlike the earlier days of education when concepts like net neutrality, 2G, 3G internet accessibility never really existed, learning was limited to the hard copy reference books of the library and whatever was taught and discussed in the class as part of peer learning and self-discovery. But for you, the Generation Y, the whole scenario has changed. The process of gaining and sharing knowledge was slow for us older generation folk. But since the past decade, with the emergence of unlimited internet, 4G data speeds, the entire context of education is no longer the same like it used to be in the good old days. In fact it just got better !

You, the digital natives of today navigate through the traffic of a cyber world which runs parallel to the real world. This navigation may not be as easy as one tries to make his / her way through the information collection, while trying to scoop out valid and verified information. The internet is perhaps the next big thing to happen to all of us after the discovery of language. Language facilitates exchange of knowledge, and the internet fuels up the pace of the sharing such that there are no barriers in terms of nationality (language translation), university, time barriers, et al.

Generation X had to fall back on books whenever they encountered queries about a certain point, the only means to resolve it would mean bringing it to the table for discussion with peers within the four walls of the classroom or with a University Professor. For the millennials, the world just got smaller, you can easily connect with the author sitting across the globe with the help of social media like quora, popular discussion boards, blogs and websites specially set up by publication houses for the materials that they publish.

National and International Seminars could then be attended subject to availability of time and resources that permit one to attend them. However, today, the option of attending webinars exist which helps the Generation Y to connect with audience across different cultures, intellectual backgrounds and so on. Even as I write this piece of connect with you, my word software refuses to acknowledge the existence of the word webinar, it needs to update itself to a changing world where meanings are made up on the internet.

While Obama's Internet Campaign changed politics in the year 2008, around the same time the same social media accelerated the uprising in Egypt 2011. Social media (like YouTube, Twitter, Facebook, etc.) is a double-edged sword – these platforms are addictive and so can lead to a humongous waste of time. At the same time social media can be utilized productively - for non-political and non-disruption purposes. With it you can stay connected to enhance one's erudition by linking up with peers to engage in academic discourse. Discussion boards can be created for critical topics discussed in the class, where both the slow as well as normal paced learners get a chance to catch up.

The points mentioned above form only the tip of the opportunity-iceberg for unleashing and optimizing the power that you as Digital Natives are blessed with. This magazine being the very first edition of the B.Sc.IT Department, let it not be bogged down as a mediocre platform to express clichéd views; rather let it ignite and elicit more thoughts among the Gen-Y, so that there is an abundance of food for thought for anyone and everyone who is part of the millennial revolutionary era, whose full impact is yet to be seen. I urge you BSc (IT) students of St Xavier's College (Autonomous), Mumbai to use the cyber-capacities at your disposal to build resilience, to develop resourcefulness, to articulate reflectiveness and to share through reciprocity. It is when such capacities are embedded in you Digital Natives, that you can confidentially say 'Vidi, Veni, Vinci!!' - i.e., 'I CAME (to Xavier's), I SAW (Cyber world's potential), I CONQUERED (any sort of knowledge-deficit)'.

Principal - Dr. Agnelo Menezes,
St Xavier's College (Autonomous),
Mumbai - 400001.

Foreword

Prof. Roy Thomas,
Head of IT Department.

'BITMAP' is the expression of our endeavor to present to the readers the creativity and talents of our students.

Many a times such outstanding efforts and good work go unnoticed; hence, the Department of Information Technology has come up with the idea of giving an outlet to such talent through this magazine. It aims at displaying the outstanding projects of our students especially by those in their final year. BITMAP is our way of connecting with the alumni. Through it, we hope to bridge the gap between the present and past of BSc (IT).

A lot of thought and hard work has gone into this novel endeavor. I take this opportunity to appreciate all who have worked relentlessly in bringing out this magazine, I sincerely hope that this will open new vistas of progress and achievement for the department.

BITMAP – The Conception

-Pratyush Panshikar(SYBSc-IT)

Hello, readers! The Premier Editorial Team of B.I.T.M.A.P. thanks you for taking the time to read our brand-new magazine!

In this ever-evolving world, there are very few things that are unlikely to change. One of them is the fact that the world will continue to see new innovations in technology. As people of the 21st Century, we must be aware of the technologies that surround us. Being well-informed about things that affect us is a must, and technology does affect each of us, either directly or indirectly. Now, we do understand that knowing about EVERY technology in the market is extremely difficult (if not impossible) in our busy lives.

To help all of you with that, we have come up with 'B.I.T.M.A.P.' (Boring I.T. Things Made Accessible to the People). 'Bitmap' is the technical term used to describe simple graphical representations of objects. Essentially, it is just a map of bits. Computers don't speak English and we don't understand binary, but we can understand them and they can understand us, thanks to devices like the keyboard and the monitor. It would be really boring to read 1s and 0s popping up on the screen and to decipher what they mean, right.Well, that's the idea behind the title of our magazine. We aim to help all you readers understand the world of information technology in a way that doesn't bore you.

Understanding technology is important, and this especially includes the technologies of today. This may be the first edition of B.I.T.M.A.P., but we have no intention of telling you about the first editions of various technologies. We want all of you to know about the gadgets and gizmos of today, right from those that you may find useful, to those that may change the world. With this thought in mind, we, the Editorial Team, decided that the theme of this edition of B.I.T.M.A.P. will be 'Making Trends Meet'.

We hope that you enjoy reading B.I.T.M.A.P., and also find the articles within to be informative and interesting.

Embracing the dynamism of the 'exc(it)ing' world of IT

-Anwesha Das (SYBSc-IT)

My friend very innocently asks me, "My printer has been making this peculiar noise and spits out chewed-out paper. You study Computers, right? Could you please get it working again?"

For most of the 'muggles' the functioning of our field of Information Technology is fascinating albeit extremely puzzling.

What is the first thing you think about when faced with the term 'Information Technology'? Is it a string of lines of unrecognizable symbols with erroneous grammar or is it super-intelligent robots conquering the world or maybe it is the image of somebody shackled by the chains of corporate slavery?

It is undeniable that the above cryptic, cool and cheerless things are a part of IT, but that is not all! If IT seems tedious and dull to you, you haven't experienced how poignant and beautiful it is at the same time. Our Magazine is an attempt to make you reassess your prejudices and fright and embrace the changes that are a part of the world because of this ever-changing new science. Maybe I could help you start.

What drew me to the subject is how it absorbs the models of Mathematics and the variety of Languages and seamlessly blends them! There is scope for both the sombreness of logic and the inventiveness of liberal ideas. It forces you to think of how and why events occur or thoughts arise, looks for patterns and builds a structure to fit them within it.

(IT) compels you to ponder life's and sciences' mightiest questions and helps them materialize. That is beautiful, don't you agree too?

IT – information Technology or InformaTion to Real(IT)y

-Noah Sebastian (FYB-Voc)

You know our latest tech innovations and inventions are inspired by movies?

The handset 'Tricoder' in the movie 'Star Trek: The Original Series' which featured numerous buttons with what looked like small display, which is now the smartphone. The HoverBoard from the 'Subway Surfers' game by Lexus (2015), self-tying shoe laces seen in 'Back to the Future II' brought out by Nike and not to forget the more recent Virtual Reality, which has its roots in 'The Matrix'.

The point to this cumbersome list is that it all began with an idea with someone pondering over something that seemed beyond imagination at the time, but is in fact a reality now. Mind boggling and baffling is the power of our imaginative and creative minds as we are ourselves (when we look into the mirror), and so is all creation reflecting the creator.

Interactions with our peers pursuing an IT associated degree and a glance at the syllabi or content leads us to a premature contemplation about this conundrum called 'Information Technology' missing the whole picture. But upon gazing into its various fields like Artificial Intelligence, Virtual Reality, Holograms, Bitcoins so on and so forth , a spark is lit and discovery dawns that IT is not that boring old subject out of a textbook, but an avenue that everybody can contribute to. Which is why — it all begins with you, an IT student or a just a pupil from the various other disciplines or courses.

Dear readers, I personally urge you to read these articles which have been written by the Millennials of our Generation, who have tried to converge the various numerous trends of IT and bring the latest tech to the banquet of your minds, to ruminate on them so that your creative juices overflow and the gears of your mind begin a paradigm shift. Numerous opportunities await you in whatever field you opt to pursue, and even if you make a massive contribution to the world, no matter how little it is to the world of Information Technology, remember: It takes all but an idea!

We hope that you find the articles interesting, intriguing, educative, and above all, thought-provoking.

CONTENTS

THE **BORING** COMPANY

You are cruising along and then technology changes, you have to adapt.

-Marc Andreessen
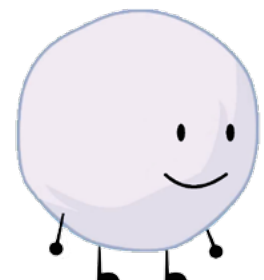
Information technology and business are becoming inextricably interwoven. I don't think anybody can talk meaningfully about one without the talking about the other.
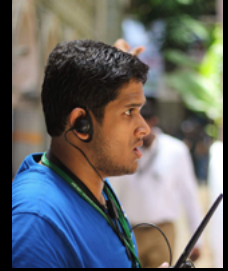
-Bill Gates

Artificial Intelligence

Hi. I'm Cortana.

Anay Singh,
SYBSc-IT.

Will AI replace me? The short answer is **NO**.

While reading the biography of a certain man named Elon Musk, I came across a paragraph that particularly stood out in his already extraordinary life.

To paraphrase, it essentially spoke about how apart from Google and Apple's introduction of the iPhone, Silicon Valley had a general sense of malaise. It even went to the extent of comparing Silicon Valley to Hollywood by saying modern tech companies like Facebook, Twitter and Snapchat changed the trend set by the likes of Hewlett Packard and Microsoft, who took big risks and engineered systems around great ideas, to the current process of simple apps and quick money.

I couldn't agree more. Elon Musk, one of the founders of PayPal, now runs 4 major companies, Tesla Motors (known for pioneering electric cars), SpaceX (which is the creation of his dream to colonise Mars), SolarCity and The Boring Company. He employs thousands of people and creates and builds physical products that aim to improve our lives as humans. Imagine travelling from Mumbai to Pune is just 12 minutes. Not everyone can accomplish what he has, however, his point of innovative ideation regarding building systems that help improve the world is extremely valid. And what brings all these ideas together? The future of the world lies in artificial intelligence.

The first major break in AI came about in 1996 when IBM's Deep Blue beat chess-master Garry Kasparov, the then reigning chess world champion. However, playing chess was all it could do.

Google Home

The next milestone was reached in 2016 when Google's Deep Blue created AlphaGo. It defeated the world champion 4-1 at an ancient Chinese game called Go. Go is so complex that the number of moves are more than the number of atoms in the universe. However, the major accomplishment was not that it won at Go but the fact that their algorithm could also perform other tasks like playing Tetris better than any other human.

Now one may ask why this is significant. Well, imagine a world where robot solutions to even the most complex of problems can be found in minutes, a world where machines can increase productivity, efficiency and eradicate human negligence and error. No, it is not a world ruled by robots but on the contrary, a world in which every human has the capability to reach their maximum potential. Some of the current world applications include self-driving cars (that are proven to be safer), robotic operations (where a medical team acknowledged that the operation was performed more skilfully than their team would have managed) and even finance and security for flagging suspicious behaviour and transactions.

We are still far from the age where machines will be able to completely think for themselves, how it is possible. Advances in this field has allowed developers to introduce artificial intelligence in such subtle manners in daily lives, such as purchase prediction on Amazon, online support on websites, news generation and security surveillance and video games. With advancements in big data analysis and improvements in deep neural networks, researchers believe, that with the amount of data collected for artificial intelligence, it will be able to solve the problem of climate change and even design factors and legislations for countries around the world.

However, it is developing at an incredibly amazing speed, improving our lifestyle and efficiency. IBM Watson is a cognitive analytic software that uses AI to assess enormous amounts of data and provide meaningful results thereof. Amazon GO is a walk-in walk-out supermarket using deep learning algorithms. You simply walk into the shop, pick up any item you want and leave. The amount automatically gets deducted from your account. Sony have already managed to make a song called Daddy's Car using just an AI program. It is possible to even jam with the same program in real-time.

Automated Car powered by AI

Tesla Model S

In the coming decades scientists and programmers would have explore just the tip of the iceberg would venture just a few of the endless possibilities that AI has. Currently we have plagiarism prevention software but soon we'd have programs that can understand our method of writing and mimic it. I could be watching a football match while an artificial intelligence program wrote this article for me.

"Computer will overtake humans with AI within the next 100 years. When that happens, we need to make sure the computers have goal aligned to ours."

-Stephen Hawking

Artificial Intelligence: In depth
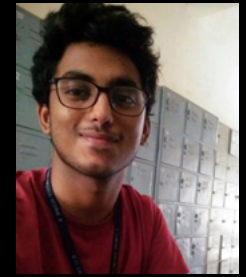
James Barboza,
FYBSc-IT.

What is Artificial Intelligence?

-"Something that is created by humans to resolve or automate a certain task."

A simple Calculator can be termed as a device of Artificial Intelligence.
How? You wonder.
Answer this within a second: log(tan 90)?
Can you?

This is the power of AI, simple calculations bring about a large complex integration. In the modern world, AI is referred to the complex computer science that only computer geeks understand, but this is not the case. Not only is there complex coding involved but also a lot of simple logic is put to use. At present, automated cars, robots, mobile phones extensively use the so called "AI".
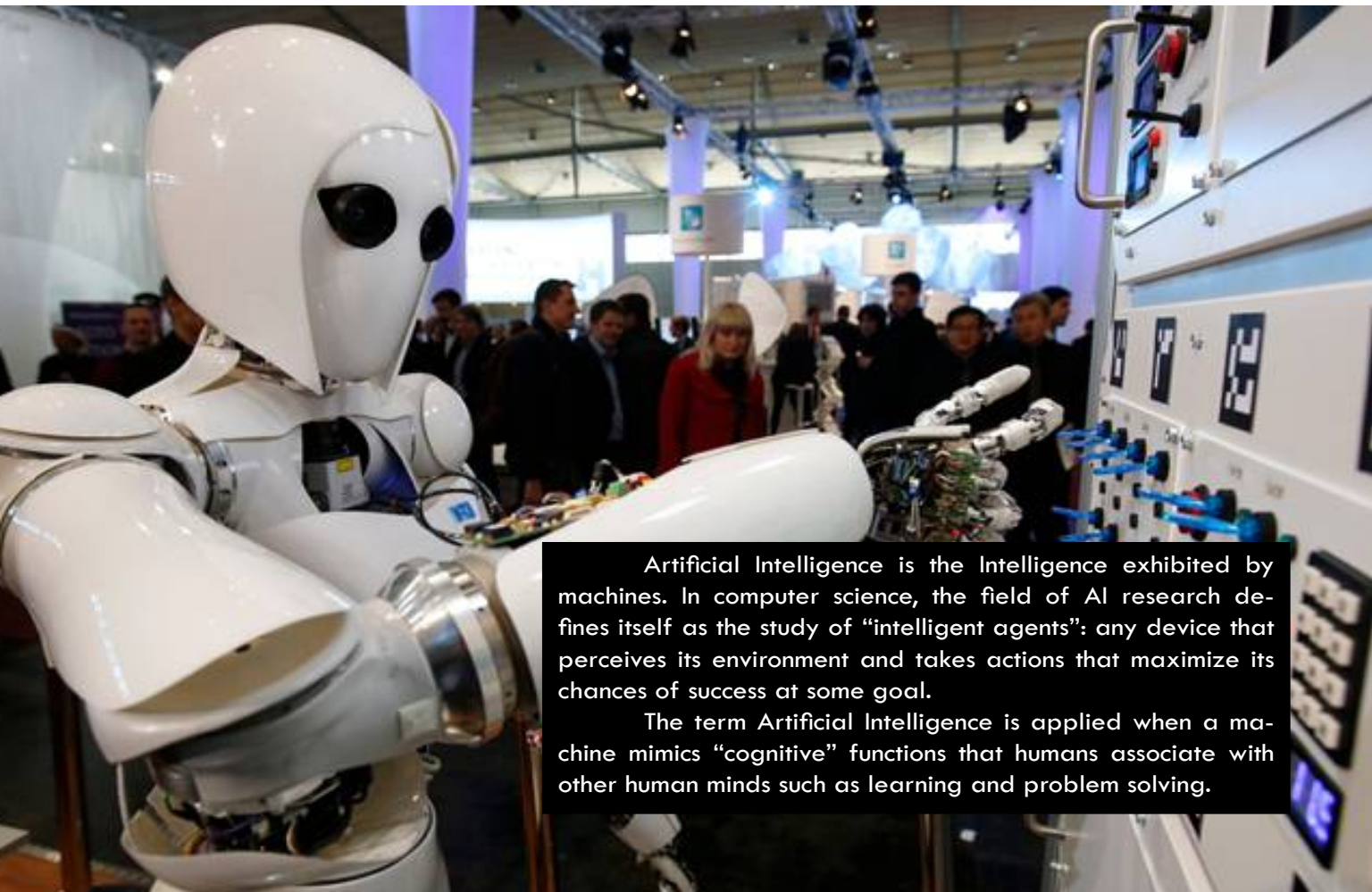
Artificial Intelligence is the Intelligence exhibited by machines. In computer science, the field of AI research defines itself as the study of "intelligent agents": any device that perceives its environment and takes actions that maximize its chances of success at some goal.

The term Artificial Intelligence is applied when a machine mimics "cognitive" functions that humans associate with other human minds such as learning and problem solving.

It is still not clear what AI can be used for but the start seems to be promising. Some think it can do wonders in the medical field, while some think it can be a daily companion in a normal user's life. What can it really do?

Did you use the GOOGLE ASSISTANT or SIRI or ALEXA?
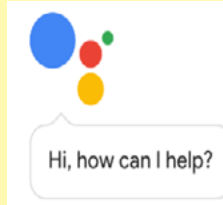
If you did, you were talking to an AI. An AI set an alarm for you, it reminded you take the milk out of the refrigerator; it called your loved ones at just one click. Could it be any easier?

Imagine using AI for every tasks we do, just one or two clicks away or not even that, just few exchange of words and the job is done.

Some applications of AI:

1. Imagine a Surgeon asking a SIRI-like digital assistant in the operation theatre about the option available in a risky operation, based on the patient's medical history matched with a global database of similar cases, "The assistant" comes up with several options in spilt second and the surgeon and his team choose one that they think is best and proceed.

2. Researchers created an AI system that scans routine medical data to predict which patients will have strokes or heart attacks within 10 years. The AI system is more accurate than doctors using standard techniques but it faces regular hurdles.

3. SMRT, a major public transport in Singapore introduced AI technology developed by Japan's NEC to its business last autumn to promote safe driving. The AI analyses data on the company's 2000 drivers including information such as native country, braking and accelerating logs and attempts to identify drivers likely to cause an accident within six months. Drivers flagged by the system receive training.

4. An AI system can recognize music genre better than humans. Can you tell the difference between big band and boogie woogie? An algorithm can. Product design and development firm Cambridge consultants said it has created a machine learning AI that can identify different musical styles better than humans. It is basically Jack Black in High Fidelity without douche elitism.

In this world of computers, it is very important to know where it is all coming from, basic logic that we humans use… so,

START THINKING; PROCESS WHAT YOU THINK AND ACT ON IT JUST LIKE AN AI.

Elon Reeve Musk is a South African-born Canadian-American business magnate, investor, engineer, and inventor.

THE BORING COMPANY

Movement. Travel. Transportation. These actions have always been part of the evolution. Early days, when the first humans discovered the wheel, they travelled to places they could not have fathomed existed. Then as we started evolving, so did our transport. Technological advancements took place through various centuries, some in the form of wheels in the earlier life or when Henry Ford invented the first car in 1885 or when The Wright brothers invented the airplane in 1903. You see any difference between these inventions? Each one is faster than its predecessor is.

As we evolved, so did our need to travel faster. We have seen various forms of fast travel like bullet trains and airplanes to name a few. In addition, as the speed of our travel increased so did the need for the luxury, which we were able to afford, increased. The current Jumbo Jet (Airbus A 380), which is one of the largest non-commercial flights in the world, has the record for the second longest non-stop flight from Dubai to Auckland, which is roughly around 14,000 Kms. Now, unless it was a super comfortable journey, Emirates would not have taken a risk like that. Anyway, the point here is our transport

systems have become faster and more comfortable in the past few years.

We have Dreamliners and bullet trains, which travel fast and are comfortable to travel in. A new en-

THE
BORING
COMPANY

trant in the market of revolutionary transport system is Elon Musk. Well, obviously, we know him as the head of SpaceX and Tesla; he has had some remarkable ideas in terms of fast and comfortable transport. His recent project Hyperloop caught the eye of the Indian Gov-

ernment and we will see its working pretty soon in the near future.

Now however fast you might be travelling, there will always be a problem of traffic congestion. While travelling by road in Mumbai, which is one of the most populated cities in the country, almost all of us had the experience of a bad traffic at least once in our lives. It is the problem with many other metro cities across the globe. Addressing to this issue, Elon Musk has come up with the idea of The Boring Company.

The main task of the company is in the name itself. Boring, which is making a hole by digging. (Not the other meaning). This idea has been on his mind for quite some time now. He revealed this idea in the TED talks in April 2017. He starts by saying that his company is trying to dig a hole in LA. The idea is to reduce traffic congestion by building underground tunnels for travelling.

Now, as we know, travel congestion would still exist even if tunnels were made. So what is different

about this idea? Elon explains this using a video. He plans to use up a few parking spaces in various parts of the city. These parking slots would be equipped with a special elevator on which the vehicle could rest upon. These are called electric skates. Now, after the vehicle is on the elevator, the elevator goes down inside the tunnels, where the electric skates travels at a speed of 200KM/H. He says that the speed of the electric skates cannot really be monitored, so they are developing softwares to control the speeds and maintain every skates' speed at 200KM/H.

This idea is a premature one. It is not yet tested. He is digging up a privately owned land at SpaceX HQ to test this idea. This idea also comes with many challenges. How can you dig up the earth and not disturb the people's harmony would be one of the major concerWns. He says that the tunnel will be dug 3 or 4 tunnel diameters under the earth. Therefore, the earth would take in all the vibrations and this would not affect the people in any way. Elon also hinted that these tunnels might be linked to the existing or new Hyperloop tunnels to give a seamless network of travel.

Towards the end of the video, we can see all of the LA underground lit up by the vehicles travelling in the tunnel. To this Elon replied that there was actually no limit to build these tunnels. They can be in a very small number or a very large number linking cities and states.

Now The idea of travelling in your own car to various different places itself is fascinating. What can possibly be more comfortable than your own car? However, at the same time questions arise as to how successful can an idea like this be. This is what futuristic technology and travel looks like. Is the world ready to take it on yet? How healthy can such a travel be? Can we really rely on a few machines with our life? Travelling at 200km/h with machine-controlled skates can be risky. Can a common man afford this kind of technology? These questions usually pop up in one's head whenever a new idea drops. Nevertheless, as for Elon Musk, has never disappointed on his promise for safety and luxury. The Tesla Model cars are one of the best and safe cars one can find in the market. In addition, Tesla has auto-driving feature, which has passed all safety tests.

Therefore, if this idea becomes a reality, the whole face of daily travel is going to change forever. Moreover, looking at the current situation of the Indian roads, India definitely needs a technology like this one.

Written by Siddhant Das, FYBSc-IT.

Access the Ability

The times when we ask a wheel-chair bound person, how do you play sports?

The times when we ask a dyslexic kid, what letter is this?

The times when we ask a blind person, how do you study?

What is it that we think?

Just a simple sentence, "He won't be able to do it."

Before even asking the person, the world decides for him or her that he or she will never be able to do this. Assumption is the biggest enemy of self-confidence. When you assume, you lose half the war. Computers never assume; they are the best friends humans could have. They do not tease us when we fall; instead they inspire us to walk when we learn to crawl. We live in a world of technology according to some, we thrive in the era of information, we talk about transforming our natural world into a digital world and the list goes on.

Accessibility does not mean access for the disabled. It simply means equal access to all. The word is often associated with "disabled"; but according to me, it just means following the principle of Equality which is the part of Indian Constitution (Article 14-18).

This article is inspired by my personal experiences. Being a visually-challenged person myself, I have experienced first-hand how the world slowly revolutionized and is still in the process to be an Open Ground (we'll talk about it in detail, later) for everyone.

When we ask someone today, what age we live in, they say we live in the Age of Technology, or the Age of Information; but as Sir Krishnakanth Mane rightly says, it's the Digital Age we live in. I believe it was an innovation-"accessible technology" when the Braille script was first developed by Sir Louis Braille. It helped visually-challenged people read and write almost all the languages with the help of just 6 dots! Braille is still one of the most consistent ways of accessing the ability of the visually impaired students, but the limitation is that all texts that exist in the public domain have to be converted into braille script.

This is when the best man comes into the picture, the Computer. I was introduced to computers when I was in the second grade and since then I have tried to be its most loyal friend. When I got the computer, I also found the need to use it. In those days, computer without vision was an empty box without usability; slowly I found that there was something called the screen reader, which makes the computers talk. My first ever experience with the screen reader was JAWS. JAWS is proprietary software which requires its user to purchase its license. In those times, there were no other alternatives, so we had to spend huge amounts of money to make the external brain talk. It seemed unfair, more like slavery, you give us money and we give you service which ought to be free.

Have any of you ever asked a differently abled person, 'What role does technology play in their life?' Let me try and answer that for you.

I have seen a variety of all possible sorts of tech trends that a visually challenged person could possibly use—right from Braille, Abacus, and Rubber Mats to JAWS, NVDA and now Orca. This might just sound alien to you but they are used in our everyday lives. Why are they used? Where are they used? What significance do they have in a visually challenged person's life?

Everything that helps me build my arsenal to show my skills is technology. Even Braille Script is a form of technology for me; it gives me access to gather knowledge just like my sighted counterparts. Our notion of accessibility is totally wrong; it does not mean making things easily available or requires less effort and hence decreases our ability or efficiency.

It can be simply understood using the term, "Create an open and fair ground to play". We don't ask you to change the rules of game for us, we just ask you to give us a fair chance to express ourselves!

Open Source Technology and the Computer

Computers are the most 'open and fair grounds' available today. A sighted person would see and write, we listen and write; but in the end, we both end up writing and with the same efficiency and that's all that matters.

I have never looked back or doubted the help technology has provided me with. When JAWS was the only software that made screens talk, it was so costly that not all could afford it. As time progressed, open source started to get a hold on the market and people started to understand the real meaning of freedom. That's when something called as the non-visual desktop access NVDA came into my life. At first the voice sounded robotic but with time the same voice became my best man on the job. When I started using NVDA, I realised the power of open source. It's a beautiful feeling to see each and every one making the full use of the computer irrespective of whether they have sight or not, they have money to buy or not, the computer strives to be fair to all of them.

After learning about the power of OPEN SOURCE platform, I DECIDED TO FIRMLY BELIEVE in the power of Linux. Linux gives you all the power in the world 'to make it as you like it'. Orca, which is a community driven project is one of the most stable screen readers which help navigate Linux without eyes. A special type of Linux designed for the blind users is Vinux. Being into IT field, we require to use IDE to write programs, different types of software's to interact with, and a lot of talking by the screen readers, in Linux all of this is more than possible because you can customise your Linux according to your needs. Emacs with emacspeak which is one of the most stable editors is one of the best I have found for programming. Of course, there are many loopholes that exist and no system is absolutely perfect yet, but at least we have a place to begin.
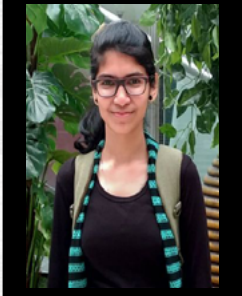
Open access the ability is all about creating a playground for all and anything. The games result can be best judged only when we play without any bias. Let's create a trend of equality rather than sympathy and mercy.

Written by Ronak Shah, SYBSc-IT.

Reported by Sarah Correia, FYBSc-IT.

TRIP TO KHANDALA

A tour to St. Xavier's Villa, Khandala, for the FY BSclT and SY BVoc students was scheduled from 2nd to 4th February, 2017. We were accompanied by our professors. We left college at 3:30 pm and reached Xavier's Villa within two and half hours.

Once we reached, we had tea and that was followed by the first activity we had to do in groups. All group activities were organised by our professors.

The activity was to make 3 items- sandwich, salad and juice within a certain time limit. Everybody was very engrossed and gave their best in completing this activity. The judge for this task was Prof. Floyd Gracias. Marks were given for garnishing, taste, and other related factors. A live digital timer kept ticking on the wall via a projector, from a web page, which gave a master chef feel to the event. An excel sheet was created to tabulate all the parameters for the judge to put down live scores shared over the Google drive. As each team kept presenting their work, the live scores sheet kept adding up the scores and displaying a rank in comparison to the scores of the other teams. The winner was chosen accordingly. After the end of this activity, everyone had dinner.

Later, a few of the students had to present and demonstrate their CG(Computer Graphics) projects to the respective professor while the others prepared for their presentations. The next day's session started off with CG as well as DCNS(Data Communication and Networking Standards) presentations. All this lasted till 7pm. Then post the dinner break, it being the last night of the trip, all the students and faculty members played antakshari, dumb charades, and more such games. Also, a bonfire was set up, and many students entertained themselves by dancing and singing together that night.

Next morning, a lot of students decided to wake up early and explore the places nearby. Many visited the older Xavier's Villa which has fallen into decay. After breakfast, there was a session where two members from the IT industry spoke to us about BSclT, its benefits, job possibilities and also about Linux and its advantages, etc.

Followed by this session, we had our second group activity where we had to build the tallest tower using newspapers, tape and a pair of scissors. The main aim of the task was to first plan properly and then execute the plan, while working as a team.

After lunch, at around 4:00 pm, we headed back to Mumbai. After the long but pleasant journey, everyone returned with lots of happiness and a bag full of wonderful memories.

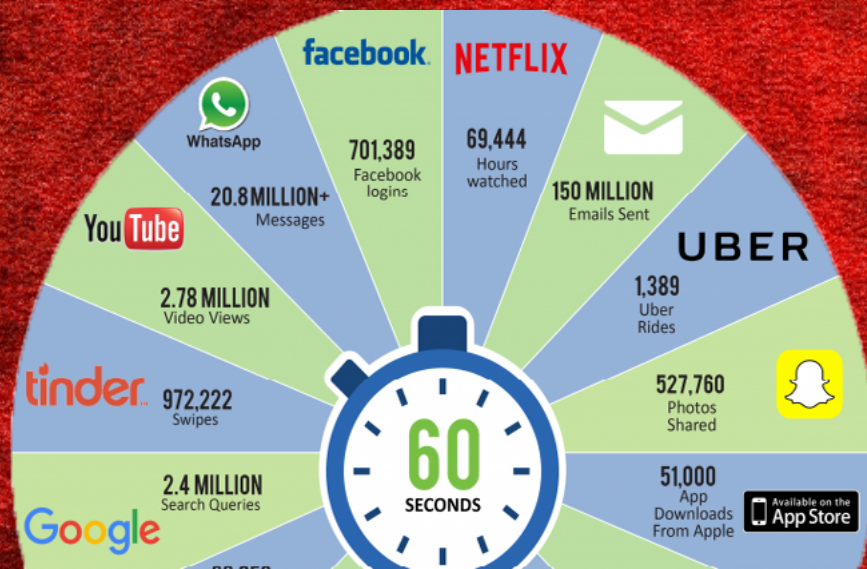Seminar on Cloud Computing

Tallest Paper Tower Activity

Prof. Lydia Fernandes
Guest Speaker: Mr. Niral Mistry
Prof. Rachna Pandey
Prof. Subhash Kumar
Guest Speaker: Mr. Joel D'souza

FY BSc-IT 2016-17

DECENTRALIZED INTERNET

facebook. NETFLIX

WhatsApp

20.8 MILLION+
Messages

701,389
Facebook
logins

69,444
Hours
watched

150 MILLION
Emails Sent

You Tube

2.78 MILLION
Video Views

UBER

1,389
Uber
Rides

tinder. **972,222**
Swipes

60
SECONDS

527,760
Photos
Shared

2.4 MILLION
Search Queries

Google

51,000
App
Downloads
From Apple

Available on the
App Store

There's a thing about absolute freedom that we enjoy from time to time. Though we may not find it in real world, Internet is the fundamental technology that has allowed us to communicate and share ideas absolutely without restrictions on a global scale. While it's easy to take the internet for granted as most of us do every day, we must think about the fact that we are not as free as we think we are on the internet. For starters most of our data is not owned by us. All the personal information, doc files, office spread sheets that we upload on our cloud storage is all legally owned by the company hosting these services.

We are comfortable with the knowledge that the 'big' companies —Google, Facebook, etc. are handling our data. Unlike the real world we can't 'own' our property on the internet. We are constantly connected to the services provided by the corporations on the basis of trust.

Ever wondered what the 'green lock' icon on the browser URL bar denotes? In layman language, it denotes that a trusted party is ensuring that you are visiting and uploading data on the 'REAL Facebook'. So, in short what I want to point out is— Internet continuously works on the trust we place in it. We, the end users trust our Internet Service Providers, SSL certification authorities and companies like 'Facebook', who we are sending our data to. In exchange for all this data it is promised to us in exchange that it (data) won't be used in any manner which we wouldn't want it to be used in.

Firstly, it is important for us to understand the basics of how the current (a little bit flawed) internet works. All the services hosted on the internet are run on a centralized server that allows other users on the network to access and modify and write data on the server. These servers are run by the corporations. That's about most of it.

This model of the internet has its benefits. Since all the processing of the data is done by these servers the end users need not have powerful devices. Its existence was essential because the processing power and data storage per user was very low in the early days of the internet.

We are familiar with the block chain technology. It became a part of the mainstream conversation between people when bitcoins were first reported by journalists and accepted in online stores. The block chain technology is a peer to peer open network that was conceptualised by an unidentified person known on the internet only as 'Satoshi Nakamoto'.

It is used for storing payment transactions permanently. This avoids the need for a 'bank' which we trust to keep all our transactions secure. Here, the block chain utilises robust mathematical rules and cryptography to keep our transactions secure thereby eliminating the need to place our trust on an external institution. The block chain technology can thus be used to create a new category of network.

This 'new' Internet, you may say, will be a distributed network with neither centralised servers nor trusted parties in the middle. The system itself will have innate cryptographic trust. All the processing power required will be distributed among all the devices accessing the network i.e., Distributed computing will be the standard. All the users' data will be owned by only them. One of the recent attempts at the creation of such decentralised platform is 'block stack'.(P.S I highly recommend visiting their website.)

We are well aware that creating a perfect system is close to impossible. We can only gradually move towards it one step at a time. Decentralised internet may be one of the many ways to fix the problems of the existing Internet that we rely upon and trust blindly and create a network where the end users have total control over the direction of the network. This is the only way that we can truly experience freedom online.

Written by
Vyshak Manikandan,
SYBSc-IT.

JUST PROGRAMMING

Humans and computers use 'language' for communication;
Most of them available, have the same definition.

HTML for efficient webpages forms the base;
CSS to it, is like make up on a actress's face.

The first language mostly taught is C,
Its interface is such that you will never wish to see.

Then comes C++ with the concept of OOPs,
Object and classes here form the troops.

Advancement in C++ gives way to JAVA,
If not understood its easier then, to bask in lava.

With PHP you can almost accomplish all,
Server Side Programming, is what people call.

JavaScript in programming can take you to success,
Angular and Node, you have to supervise with a caress.

SQL holds the key for the data to bind,
Queries in it will boggle your mind.

.Net technologies are most secured, they say
Learning them is not at all a child's play.

Python is a language named after a snake,
It was made with ease of coding at stake.

Linux really is a long piece of segment,
Everything there has an argument.

LEARNING THOROUGHLY JUST ONE LANGUAGE IS THE ONLY
BAR,
THEN SUCCEEDING IN LIFE WILL NOT BE FAR.

My message through this poem is very simple that do not try to be a jack of all trades and master of none but just try to be as good as possible in one language, practice the same as much as possible and it will lead you to success in your IT career.

Written by
Shreeyash Yende,
FYBVoc-SD.

Written by
Zachary Borthwick,
SYBSc.

BIO-CONSERVATION

Homo sapiens are arguably one of the most ingenious species in all of the Animal Kingdom. We have made large strides in science and technology ever since we started appearing on the face of earth. Today new developments in technology are being made almost as swiftly as one can say, 'I should buy this new cell phone.'
Technology has without a doubt made lives a whole lot easier but it's doing a lot more than letting us shop for groceries while soaking our feet in the warm bath tub water.

Technology is transforming the way we can 'Save the World'. It is beginning to help conservationists and wildlife scientists protect a range of both common as well as endangered wildlife species— even the ones facing the danger of extinction. They have proven useful in mitigating the human-wildlife conflict.

1.   Google Earth

I spend hours experimenting with Google Earth—zooming in onto the roof of my house and waving out of the window, trying to see if the satellite ably locates my hand.

Who would have thought that a discovery on Google Earth would end up saving a bio-sensitive zone from exploitation by Oil Exploration? It was beyond imagination to have known that an entire Rain-Forest in Mozambique could be preserved by this brilliant technology!

In 2007, Dr. Chris Simpson, a coral reef expert was shocked to find fringing coral reefs, while exploring the area using Google Earth. Fringing Coral Reefs are extremely rare. These are the species of coral reefs which can survive only in arid conditions, like that of the Red Sea.

"I feel like bloody Charles Darwin up here discovering these new reefs!" He said, after the marvellous discovery.

The reefs were found in a largely inaccessible area which is called Kimberly. Kimberly was being considered for oil exploration! However due to Dr. Simpson's discovery the Kimberly area in Australia has now been given a Marine Conservation Status.

In 2009 scientists at The Royal Botanical Gardens, came across on Google Earth, a large area of woodland near Mount Mabu (which was then unmapped). It was later found to be the largest area of medium-altitude forest in Southern Africa. It was only after the first-hand exploration of the forest, was it found that the forest was home to three new species of butterflies, one new species of snakes and seven species of endangered birds.

2.   Beetle Cam

It is almost impossible to get too close to animals especially wild animals, without spooking them or coming back in one piece. At the same time it is essential to observe them to find more about them to help with the conservation process in a coherent manner.

Will Burrard-Lucas, a wildlife photographer has come with a remote controlled Beetle Copter, which enables him to take the best pictures.

He is constantly working on ways to improve his Beetle Copter and is also working on a range of camera traps, which are stationary cameras that click pictures whenever it senses an animal in front of it. Camera Traps have been found to be extremely useful when it comes to capturing pictures of elusive or nocturnal animals in their natural habitat.

3.   Remote Controlled Sampling

Tissue cultures are an extremely important tool for research, especially in the field of genetics. However tissue samples usually end up leaving injuries to animals and it is sometimes extremely difficult to collect samples from elusive species like whales.

But now, scientists at the ZSL Institute of Zoology have come up with an innovative solution— using blood samples instead of tissue sample. They have been monitoring characteristic of whales and other cetaceans (carnivorous aquatic mammals which include dolphins and porpoises) and have hit upon a feasible way to collect a sample.

Whales expel snot, vapour, and biological material with every warm blast of whale 'blow'. Scientists allow a remote controlled helicopters or drones to hover above the whales' blow-hole which are equipped to collect the sample of snot when the whale exhales. This has made studying such animals easier.

CONSERVATION IS DEVELOPMENT

4.   Texting Elephants

Elephants strolling into farms are common in Kenya; they end up destroying crops and sometimes can also get severely injured by actions of agitated farmers trying to protect their livelihoods.

Suppose elephants could text the farmers, right before their 'friendly' visit. Not so much of a surprise guest anymore, right?

In 2005, a group of scientists including zoologists and software engineers came up with a collar which has a cell phone SIM in it. They can now keep a track of the movements of these elephants when the SIM sends a text message with the animal's location. Sometime soon they envision having the elephants 'text' the farmers when they get too close to the farm in that way the farmers can prevent too much damage and take precautionary measures, saving their farms as well as the elephants.

5.   SMART Hooks

Imagine you're a fisherman, out in the open sea. You've let down your hook and line and are awaiting your usual catch — another rather docile fish. All of a sudden you feel the cord tug, you reel it in with much difficulty and to your horror it's a shark!

Not only do you not have your favourite fish but also you now have a shark on the line (good luck trying to remove that hook)! Don't forget that you might have just killed one of the most endangered creatures that dwell the sea. Seems pretty disastrous right?

Well, don't fear for SMART (Selective Magnetic and Repellent-Treated) Hook will keep the unwanted fishes off your catch. It has magnetic properties and a metallic coating which produces voltage in water.

Sharks usually hunt down their prey by sensing electronic fields produced by the prey's body; the SMART hooks produce a type of electronic field that will repel sharks from the hooks, even if there is bait.

STOCK MARKET

Written by
Abhilash Chikoti,
FYBSc.

"If General Motor had kept up with the technology like the computer industry has, we would all be driving $25.00 cars that got 1,000 miles to the gallon."
This is quote by Bill Gates, co-founder of Microsoft and American business magnate.

These words distinctly explain the way Information Technology has been advancing and it is evident that the very identity and importance of IT lies in the way it supports other fields. From sports to education, manufacturing to consuming, IT has revolutionized every field in its path of evolution.

Stock market, $62 trillion entity today (estimated value of world stock market), utilizing the bounties of Information Technology underwent unique and remarkable transformation over the years. All the processes of the stock market, which once mostly consisted of paper work, were computerized much before the current phase of digitization started.

KNOWING ABOUT THE STOCK MARKET

Stock market is considered to be a game of knowledge and patience where one's loss is another's gain. It is important to understand a few basic terms to appreciate how stock market is benefitting from IT.

Stock is a share in the ownership of a company.
Being a stock holder means you own a tiny part of a company. A Stock Exchange is a place where buyers and sellers meet and decide upon a price and an order is executed, for e.g.: Bombay Stock Exchange, New York Stock Exchange, etc.

A Broker is an individual or institution that arranges the transactions that transpire between a buyer and a seller, for a commission when the deal is secured.

We are going to look at only a small part of stock market, the other aspects like bonds, mutual funds, Forex, etc. don't need our deeper understanding for us to be able to understand what we are going to discuss in this article.

TRADING

The very entry of an investor into stock market starts with creating their DEMAT (dematerialization) account, for holding e-share certificates, and online trading account. The most important task of investors is to decide on which stock to buy or sell and when to trade. The most common way of deciding is Graph Reading— analyzing graphs that depict previous and present prices of a stock. Thanks to technology, use of advanced GUI elements like loss and stop lines, toggles, etc., have made graph reading effective and much easier. Many websites and softwares have evolved brilliant new technologies e.g. Tradetiger, Kotak Stock Trader, etc., to speed up the processes of buying, selling and searching for suitable stocks. There are many other apps which are supporting traders with live stock market updates and other important financial news. With access to internet over mobiles and computers, knowledge of stock market, which was once kept preserved in a pot by the educated half of the society, is now accessible to everyone.

Orders are executed at tremendous speeds, at Exchanges, to match with the speed of investors and hence the requirement for advanced and the best technology.

In an interview by the CEO of Bombay Stock Exchange in 2015, he stated that their capacity is 5 lakh orders per second with a response time of 200 micro seconds. Exchanges also use high standard servers for organization and storage of the gigantic data and all the processes are done in fractions of seconds. National Stock Exchange, largest in the country, uses powerful UNX servers produced from HP. The latest software platforms like ORACLE, RDBMS, SQL/ORACLE FORMS Front Ends, etc., have been used for the exchange applications. For further information regarding the technology used at Stock Exchanges readers can visit their respective websites.

Stock Brokers are important patrons of Information Technology because employing technology, along with trade execution and linking, serves their vital need of attracting more clients. Computers are also deployed for tasks like summarizing account activities and generating tax statements which are time-consuming and tedious. Usage of computers made everything so easy and has become so significant that investors are judging brokers based on the technological facilities they provide next to their commission rates.

In addition to supporting investors, brokers and exchanges IT has also backed stock market in achieving many other feats. With the current boom in mobile technology steps are being taken towards incorporating the much larger smart phone using community, which can't afford to buy computers, into traders club. The emerging mobile app technology is manifold times productive and efficient than the conventional call-n-trade system. Virtual trading platforms like MoneyBhai, Stock Simulator, etc., are encouraging budding investors like students to invest using virtual cash in simulated environment and are helping them in understanding the tactics of stock market before risking their own capital.

In conclusion, Computer technology left no part of stock market uninfluenced. From connecting the people (i.e. investors, brokers) to helping the investors in making decisions, technology has taken over every task. With advent of IT, papers have transformed to e-files and records to databases. It is obvious that technology has come a long way but still its road never ends until every last person enjoys its fruits.

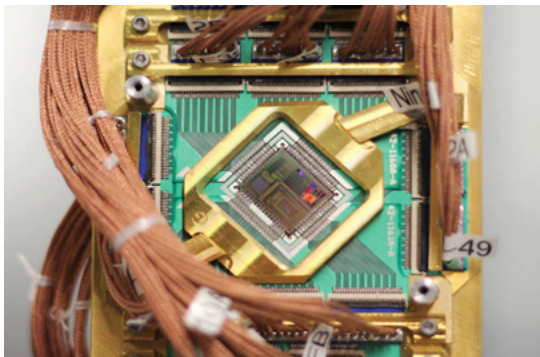# CLOUD AND QUANTUM COMPUTING

Differential
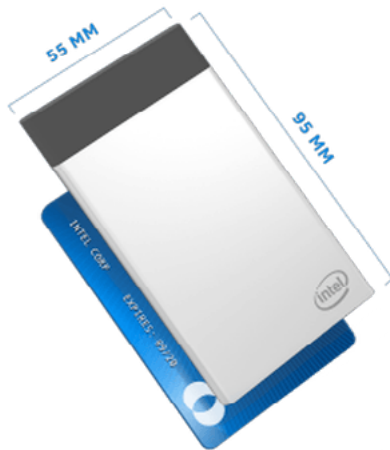
Credit Card PC by Intel

In today's fast paced world, computers are changing rapidly. From the time of Charles Babbage's Differential Engine to the Credit Card Sized PC, computers have come in all shapes and sizes over a period of time.

Over the past decade, processors have evolved drastically with Moore's law where processor dies were shrunk and new revised micro architectures were created. Intel followed the tick-tock procedure but eventually Moore's law might run out of steam because transistor shrinkage could stop anytime in the future. In the future we might have atom computer storage units where 1 atom can store 1bit. IBM was the first to show that this concept was possible in 2012.

Since devices have shrunk in size, we need to constantly depend on servers to process large amounts of data so that the result can be viewed on these small devices which can fit in our pockets. Devices such as mobiles, smart TV's and portable computers are constantly dependent on the network for getting content because they have limited storage and processing power. The concept of cloud computing was born because of this constant need of the network. When mainframes were mainstream, each server was only used to host one application and this led to a poor utilisation rate. For that reason the concept of virtualization came to picture. Virtualization let multiple operating systems and applications run on a single server vs. one operating system and application per server. This concept helped organizations in cutting costs and this concept helped usher in an era of server consolidation. So cloud computing used this concept of virtualization and applied it to operating systems as well as networks as well as storage and made the management of this virtual infrastructure more smarter by providing a set of tools to control the energy consumption of data centers by allowing the infrastructure to scale up when load is more and scale down when there is the least amount of load. Another concept which cloud computing incorporated is container computing. Container computing is based on OS virtualization where the kernel can spawn off another kernel as a full-fledged bash operating system. This leads to virtual machine consolidation which further reduces costs.

The cloud has various service models such as Infrastructure as a Service, Platform as a Service, Software as a Service, Security as a Service, Mobile backend as a Service and Serverless Computing. There are many service providers which provide cloud services such as Google, Amazon and Microsoft. Most of these services are pay by the hour services. Also the cloud provides remote protected stor-

age for users. Some of the providers for cloud storage are Box.net, Google Drive, Microsoft Drive and many more. All your social media sites such as Facebook, Twitter, YouTube, etc are powered by cloud farms. Since Artificial Intelligence is being integrated with the cloud, it's becoming smarter and smarter everyday. AI assistants like the Google Assistant, Siri and Cortana leverage the cloud for recognizing speech as well as for processing the task given to them. The cloud contains a huge sample set of voice data, so these assistants can make decision based on the past experience with the user. Also AI helps in smart management of the cloud where the cloud can scale up and down automatically depending on the load.

There is a need to accelerate processes on the Cloud. A concept known as Quantum Computing is in the work. This concept is based on quantum physics and makes direct use of quantum-mechanical phenomena, such as superposition and entanglement, to perform operations on data. In quantum computing, bits are represented as qubits. A traditional bit can only represent 1 and 0 at a time, but a qubit can represent 1 and 0 simultaneously due to the superposition properties of quantum physics. This means that a quantum computer can perform calculations a lot faster than our traditional transistors. This means that AI can really speed up and hopefully we don't come to a situation where man is not needed for the job. Also the jobs for mining bit coins can be done a lot faster with quantum computing. Google, NASA and D-wave together today are researching ways on how concepts of quantum physics can be used with computers. D-wave created the 512-qubit D-Wave Two quantum computer which can calculate 1000 qubits which is used by Google and NASA. The chip of this computer uses a fraction of a microwatt but the cooling uses a whopping 15 kilowatts of power. Still this technology is in its infancy, but research of linking this type of computer to the cloud is being done at a tremendous pace. Recently the Chinese scientists made a quantum computer which is 24,000 times faster than all the quantum computers put around the world and in some ways could dwarf the processing power of today's supercomputer. China launched the world's first satellite with quantum communications which is being researched for the purpose of transmitting hack proof encryption keys to and from space. This is the future of computing.

Before I end this article, I would like to conclude that, a machine cannot replace man because man is the reason why the machine exists. GOD has given man special gifts and a Spirit that a machine can never possess. Whatever the purpose, man is the boss and machine is always the servant.

Written by Aaron Stanislaus Johns, Alumnus BSc.I.T. -2013-14

Where I Stand Now

Brian Fernandes
MS Management Information Systems '18,
Texas A&M University.

I completed my Bachelor of Science in Information Technology degree in 2012. Five years in St. Xavier's (Including 2 years in Junior college) had taught me a lot. I was ready to apply the knowledge and skills that I had developed in Xavier's in the corporate world. After graduation, I took up a job as a Software Engineer at BNP Paribas, one of the largest banks in the world. The coursework that I completed in BScIT had set a strong foundation and I built upon this foundation while working in the industry. After working for four years with the latest technologies and developing software in the Corporate and Investment Banking domain, I was ready to take the next step in my career and take up a new challenge.

Thus, I decided to go back to college and pursue a Master's in Science degree. I am currently pursuing a Master in Science in Management Information Systems program from Texas A&M University. More popularly known as MS-MIS, this program is a mix of business and technology courses which help young technology workers acquire important business skills to supplement their technical knowledge. In this day and age, it is becoming increasingly important for workers in the IT industry to be able to solve business problems, and not just technical ones. Hence, understanding business processes, and designing technical solutions which help solve these business problems is important.

The MIS is a study of technology, people, organizations, and the relationships among them. It focuses on a mix of communication and interpersonal skills, computer system knowledge and a practical business orientation which is used to solve business problems and create new business opportunities. Typically, a student in MIS will take up courses such as Data Management, Advanced Systems Analysis and Design, Business Information Security, Corporate Strategy, Enterprise Data Management, and Business Data Communications. Depending on the university, a student can customize their degree to be more technical or more business-oriented by taking up appropriate courses. After graduation, MIS professionals take up jobs as IT Consultants, Information Systems Managers, Business Analysts, Business Intelligence Analysts, Data Scientists, and other such techno-functional roles. Due to the nature of these roles, these jobs are available across several industries and domains and not just limited to the IT servicing industry.

With the growth in technology, the demand for MIS professionals will keep increasing. Employment in all the Information Systems fields is expected to rise by thirty percent between 2010 and 2020. This growth and demand for people skilled in technology and business make MIS professionals one of the most sought after candidates in Information Systems jobs and this trend is set to continue at least for the next 10 years.

Campus to Corporate

Alumus - Leon Cornelio,
BSc-IT,
2009-2012.

I joined St. Xavier's College in July, 2009 to pursue BSc-IT. I was not interested in studies, but they are required for academic growth, so I needed to do something. Over the course of time, the faculty of the department of Information Technology made me feel enthusiastic about learning the subject matter. The professors had taken great efforts to impart knowledge to us in their respective subjects. There were many social activities too, such as volunteering for Malhar and athletics that helped in my overall development. In the 5th semester, we had a subject called 'Enterprise Resource Planning (ERP)' and it is this subject that caught my attention. I kept researching about this subject in depth, and in the back of my mind, I knew that I had to build a career in ERP.

I went on to pursue M.Sc. in Computer Science in June, 2012. All the knowledge and values I had gained over 3 years at St. Xavier's helped me a great deal to excel not only in my course but in various other activities. The course consisted of subjects such as Artificial Intelligence, Software Project Management, Network Security, and Wireless Communication, along with a few projects. The internship I did in the last semester helped me to understand how the technology we learnt about is actually used in the industry.

My career began in August, 2014 as an SAP Materials Management Consultant in an MNC. SAP is software that provides complete enterprise solutions. The organization gave me the required training and assignments. It provides solutions to all industries. These solutions can be modified as per the requirements of the customers. SAP is used by most medium to large-scale industries and therefore there are many job opportunities for it all over the world. I undertook projects in automobile and aerospace industries through which I got to learn about other SAP modules like Production Planning, Sales & Distribution etc. I am currently working for a startup and I'm contributing to the industry as well as learning various aspects of business.

Moving from an MNC to a startup was a very difficult decision to make, but for the past one year that I've been working at the startup, I have not regretted my decision even once. It is advisable to join a startup after having relevant experience in a large organization. It will help to contribute to the growth of the startup very easily. The environment in a startup is completely different compared to that in an MNC. In a large organization, many employees are assigned work on the same process but in a startup, one employee is assigned work on multiple processes. In the beginning it is difficult to work on multiple tasks simultaneously, but the amount of knowledge you gain over a short period of time is overwhelming. What one may learn in two years in a large organization can be learnt in a few months in a startup. Moreover, the employee strength of a startup is way too small compared to that of large organizations, which makes it easier to communicate with all other employees at your workplace.

Truly, St. Xavier's is not just a college. It is an institution which has helped me shape my life. I remain indebted to this institution for moulding and creating interest in me for the subjects taught and for teaching me the values of life needed to face the business world.

# ROGUE SYNDICATE AND APP OF REALITY

Mayank Kumar (TYB-Sc-IT 2016-2017) designed a graphic PC game and Augmented Virtual-Reality app. He's brilliantly put to use Unity, Google Cardboard and Voforia to create awe-inspiring designs and a robust live database to keep track of the number of downloads and games played.

In the quickly developing field of software engineering and game development everyday new innovations and techniques are being conceived to attract more crowd flow. PC Games or video games are games played on a personal computer rather than a dedicated game console or arcade machine. Their characterizing qualities include a greater degree of user involvement, a generally greater capacity of input and output, processing, graphics, scripting requirements, ability to adopt new technology and animation.

The project is divided into two parts:

1) The PC game
2) The Augmented-Virtual reality app (Android)
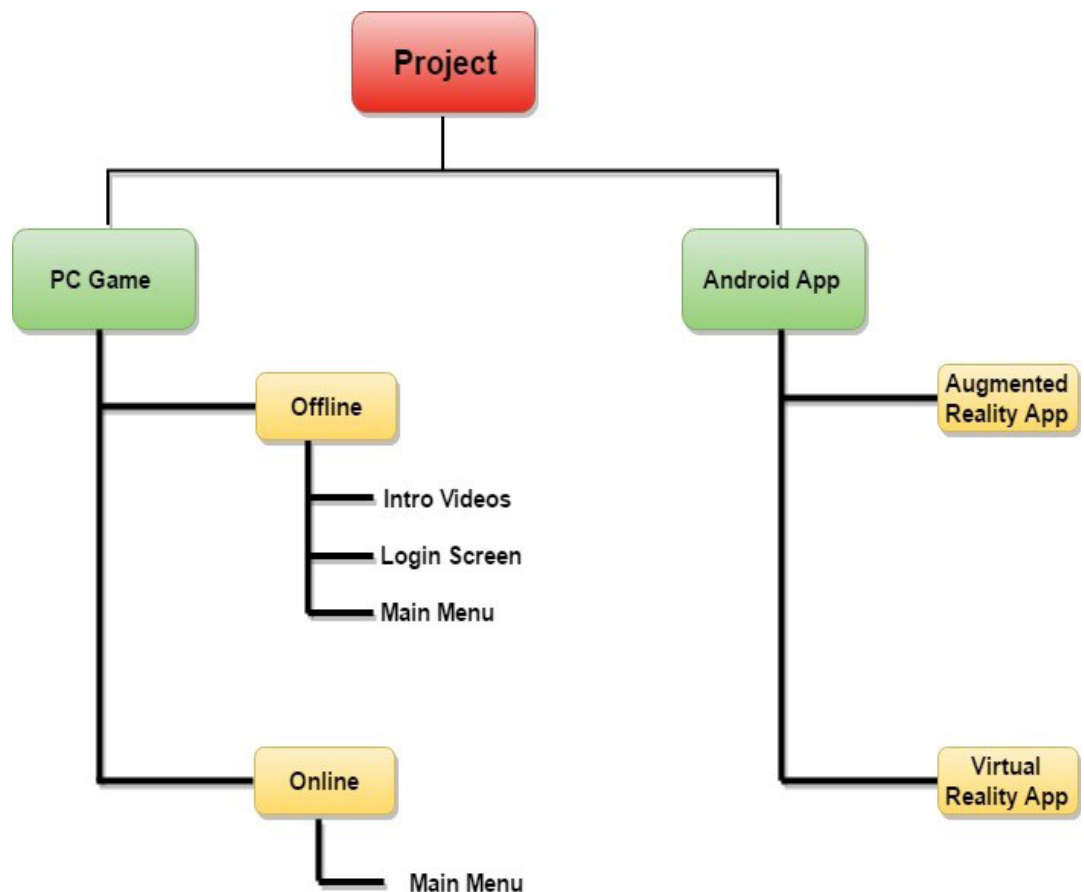
The first part i.e. the PC game is an open world game with a combination of first person and third person shooter with a sequence of different levels.

The main playable character of 'Rogue Syndicate' is an army soldier. A Narco-terrorist organization named 'Santa Blanca' recently attacked USA and demanded that their soldiers be removed from the borders else they will be forced to use extreme and brutal force. There are several levels and in each level there is something unique. The enemy AI is a finite state machine based AI.

Online database is used for login and keeping track of how many people have downloaded and played your game. Whenever a user plays the game for the very first time he will be asked to create an account to play the game. The data is stored online on a free web hosting service. After creating an account an email is sent to the user id. The database is hosted live by 000Webhost.com.

The game also contains a multiplayer gameplay where each player gets a control over tank and the aim is to obliterate opponent tanks.

UI Design of the game

Various Enemies in the game

Environment in the game
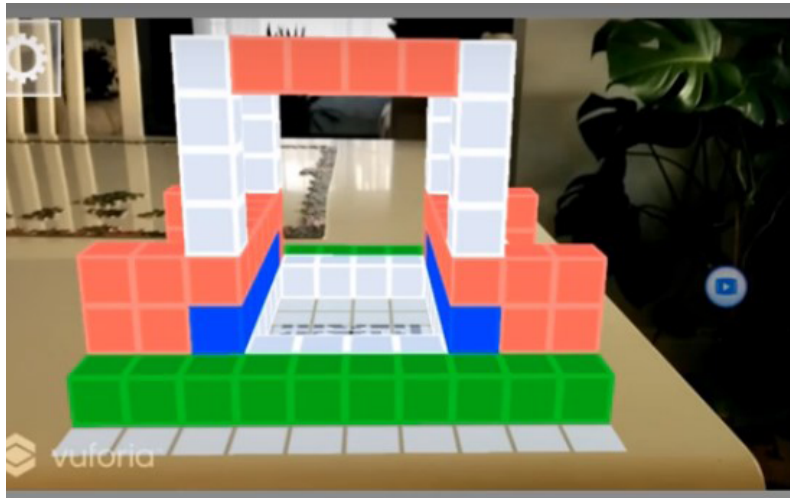
Augmented Reality Lego

As a third person character user can see the player's body. Third person character has abilities like roll, walk, run, crouch, fly helicopter, fire weapons, take cover, etc. Whereas, in first person the user cannot see the player's body and only can see the gameplay from the player's view.

The second part of the project is an Augmented-Virtual reality app for android platform. In the augmented reality section user gets a complete simulation of a museum using Google Cardboard. As the user rotates his head the view gets shifted in the direction the user is.

Augmented reality section of the app is made using a plugin 'Vuforia' which allows user to create building blocks similar to Lego. The app represents augmented reality with an image target i.e. when the app is projected towards a particular image then only user gets an interface.

TRAIN TEAM- RAIL RAIDERS

'Rail Raiders' was designed by Rajshekhar and Mehika Pires (TYB-Sc-IT 2016-2017). It is a Collaborative Multiplayer Game, which is instruction based and encourages team-spirit.
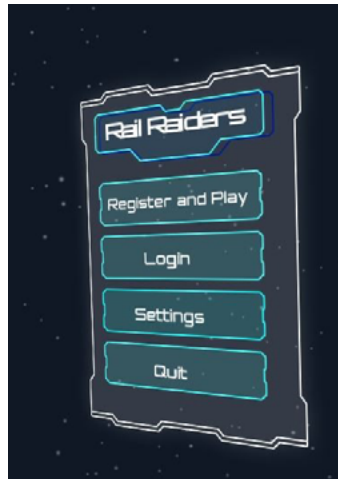
Games have always been an effective way to reduce stress and instil a certain sense of the competitive spirit in every individual. The idea of out-smarting your contemporaries has been the key note in most games.

Our project, Train Team, employs this approach by being a multiplayer collaborative android game that requires players to coordinate their activities in order to be able to deem themselves as invincible master players.

The main objective of this game is fuelled by an expectation to inculcate strong peer to peer interaction skills, thus fostering team spirit. Every individual player is responsible for the ultimate success of their team, hence integrating every member as an essential component.

Being an instruction based game, it is simple, yet complex, in a way that requires utmost player vigi-lance and tests each player's reactive instinct –response. It also provides an opportunity to sharpen the cognitive skills such as hand-eye coordination, focus and increased concentration.

It truly aims to enrich every player's experience and challenges the traditional competitive nature of games.

Game development today is growing manifold, thereby, rousing the need for games that appeal to the user both through external appearances as well as the internal structure in terms of the setting and complexity. Keen attention has been paid to the use of graphic technology in order to conform to this requirement and provides easy adaptability while at the same time, retains an essence of innovation.

Description of the System:

Train Team being a multiplayer game, is locally hosted using a mobile device and connection is enabled via Wi-Fi. A minimum of 2 and a maximum of 4 players, with full access to the internet is the basic requirement. The functioning of this game will involve a mobile being used in the following ways:

1.   A designated server to host the game locally.
2.   A client(s).
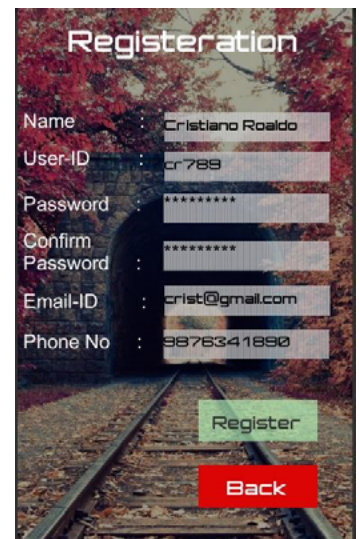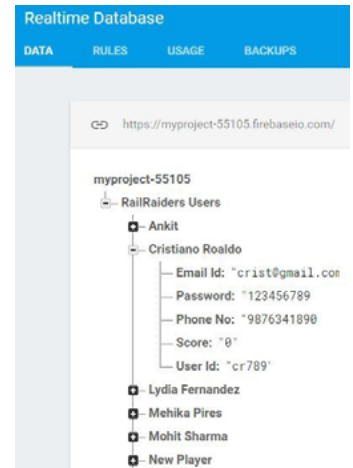
A player proceeds by first registering his/her details and logging in. A robust registration form has been designed that ensure every field in the form has been filled in correctly.

Every client connects via a lobby, where every participant is staged before all the

players and the server is ready. Proper server connection is a key requirement. Once all the elements enter a ready state, we can take on the challenges that this game puts us through i.e., requires every player to follow the instructions and manoeuvre the train to reach its destination.

Every level consists of predefined sets of scenes, which in turn consists of controls required to operate the train. Every control will have its corresponding instruction to be informed which will be time bound. Each client/player will load one amongst those predefined scenes, thereby ensuring that every player has a different scene. Instructions generated will correspond to an entire set of scenes/level and not just to an individual's control screen.

This means that an instruction generated could correspond to a particular player's controls or another team member's control panel, thereby requiring every individual to pay keen attention and shout out the instruction received. Every instruction executed will be recorded on the server and only if the desirable number of executed instructions has been crossed will the game proceed to subsequent levels. If instructions aren't executed within the prescribed time the game ends and a restart of the same is required.

A scoring system has been implemented to keep track of the executions. Every correct execution leads to an addition of 5 points, while an incorrect execution leads to a deduction of 2 points. The addition and deduction of points also correspond to the level of difficulty. The player can pause, resume or restart the game depending on his/her present scenario. No loss of data will take place during this transition. This scoring system has been made possible by the use of Player 'Prefs' which allows us to calculate each score and to bring forth the value in subsequent levels.

The network interface ensures networking between each player's sessions ensuring that every player is connected to the game. As every player executes the instruction, this activity is stored in a variable that is passed between sessions in the form of a Boolean value: true if executed, false if missed. These variables helps to keep track of the instructions executed and serve in succeeding to the next levels. The network between players is established through a lobby manager which is an inbuilt networking feature provided by Unity. It offers safe and secure connection establishments. At the end of each level, there exists a transition which helps to keep track of the player's states, i.e., unless all the players are in the same state of completion, the game will not proceed further. Any attempt to connect to subsequent levels will fail if even one single member of the team fails to reach the true state of completion.

An implementation of an online database which has been made possible by the open source, Google powered software –Firebase, serves to store the information associated with every player, which include – Name, Identity, Score etc. A realtime leader-board of the high scorers has also been implemented.
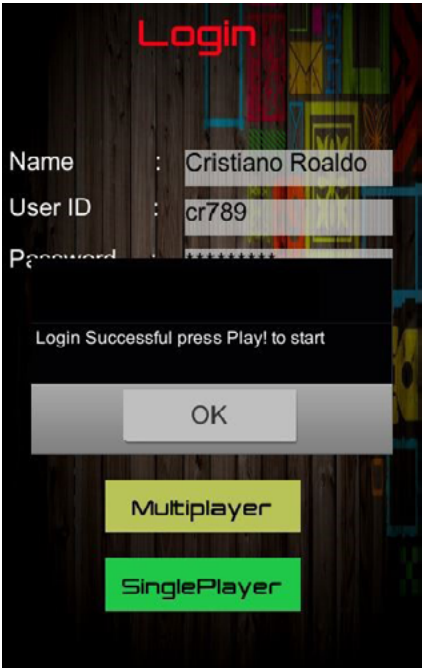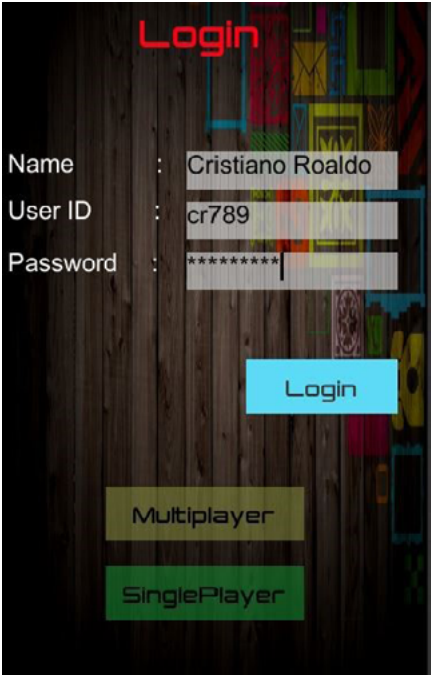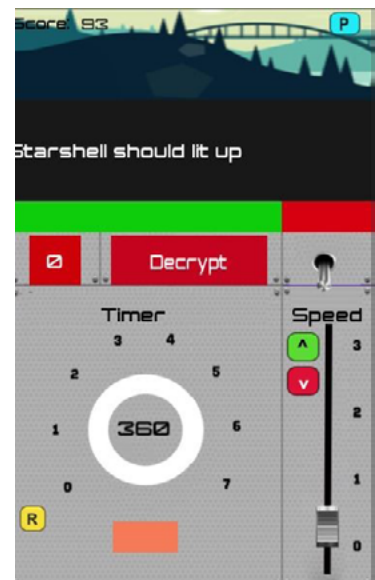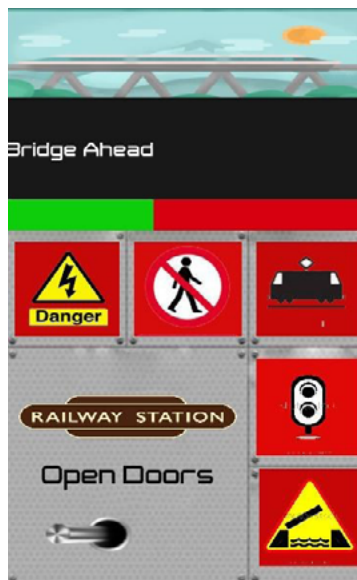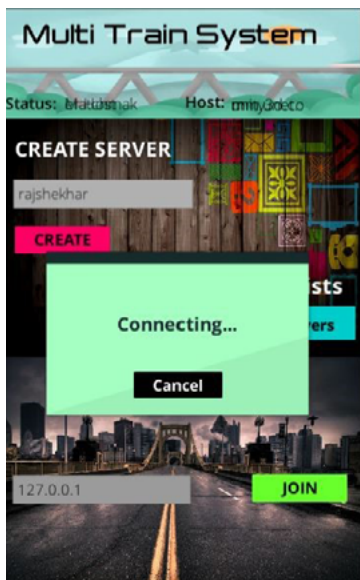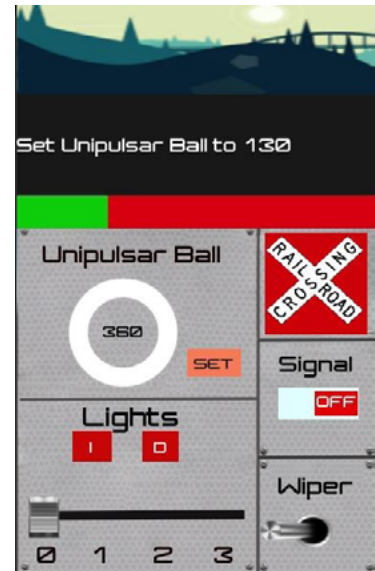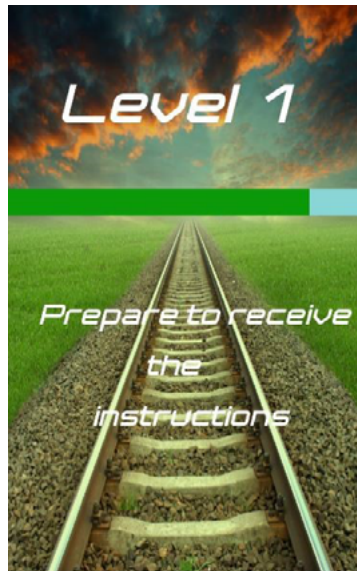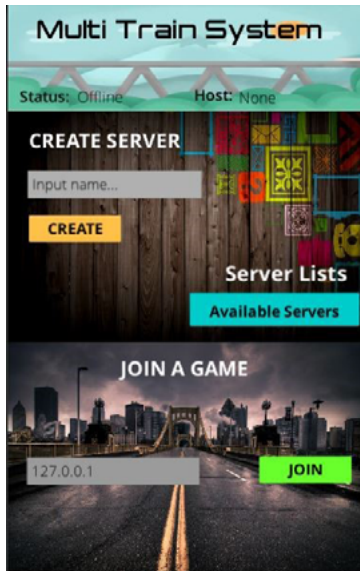
Screenshots of the Game

AUTOMATED PARKING SYSTEM

'Automated Parking System' was designed by Kajol Dhankhar (TYBSc-IT 2016-2017). It employs Ultrasonic sensors, Arduino and MAT-LAB to capture and successfully calculate the parking charges for a parking space automatically booked via the system.
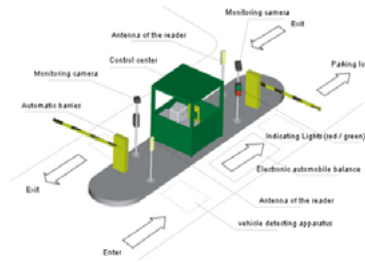

Figure 1: Parking lot management system [1]

With the drastic increase in the use of digital gadgets most daily jobs are now performed digitally. This makes everything easier, faster, and more efficient. Given the option, most people today would prefer doing things electronically rather than sitting down with a pen and paper.

This report discussed on automatic parking system and electronic parking fee collection based on vehicle number plate recognition. The aim of my project is to develop and implement an automatic parking system that will increase convenience and security of the public parking lot as well as collecting parking fee without hassles of using coupon or magnetic card and require less human interaction. The system is divided into sub-systems which are display system, image acquisition and plate number recognition and auto payment system. Firstly, data is acquired from ultrasonic sensors of each parking space to count the availability of parking spaces in the parking area and is displayed on LCD. Then, image of the car is acquired in the entrance to be analyzed. During this time, time entering and license plate reference number are recorded for future transaction. The time entering is analyzed during car exiting to calculate the fees of parking according to specific parking rate. This design can be further extended in terms of area and layout and characteristic level by using advanced MATLAB and Arduino applications.

Important Functionalities

•   It consists of three sections. One is the detection and recognition of the number plate, Second section involves the calculation of the IN-time and the OUT-time and the tariff and Third section is the Calculation of Monthly Fare Collection.

•   The detection of Number plate is done by using MATLAB wherein a code to acquire the image is simulated and the extraction of the same is done by using the Edge Detection Technique.

•   The next section involves the use of Arduino which is interfaced with the LCD to display the tariff and the availability of the parking lot. It involves Hardware connections.

Algorithm

1. License Plate Localization

Firstly the car image is captured. Then, the system should extract the number plate of the car alone for the segmentation of character purpose. This plate localization algorithm is based on combining morphological operation sensitive to specific shapes in the input image with a good threshold value by which the license plate is located.. This variance can further compound the complexity for an algorithm to ascertain what area of a vehicle constitutes a license plate and what area is not.

2. License Plate Sizing And Orientation

Components of algorithms that adjust for the angular skew of the license plate image to accurately sample, correct, and proportionally recalculate to an optimal size.

3. Normalization

The algorithm in regulating the contrast and brightness of the captured license plate image is shown below

4. Characters Segmentation

Character segmentation is a process in which each characters of license plate is separated by using the bounding box technique. Then, the recognized character image will be converted in binary format for further template matching approach.

5. Optical Character Recognition (OCR)

This is the process that identifies individual alpha numeric characters on a license plate. Algorithms also look for characters of equal color and equidistance, with similar font structures to break apart each individual character where it is subsequently processed by optical character recognition (OCR) algorithms. It translates the captured image into an alpha numeric text entry.

Flow chart

System flow chart
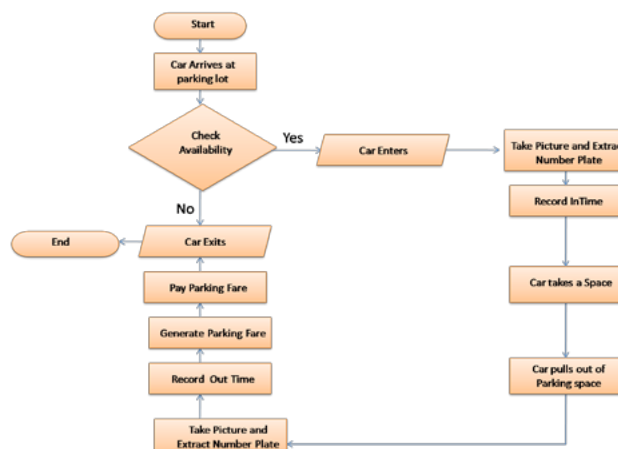
Screenshots
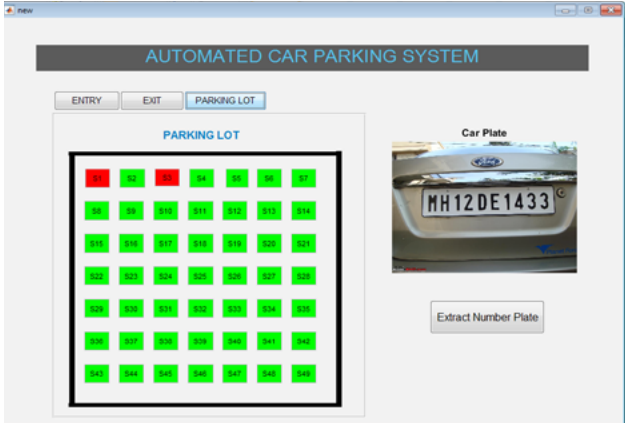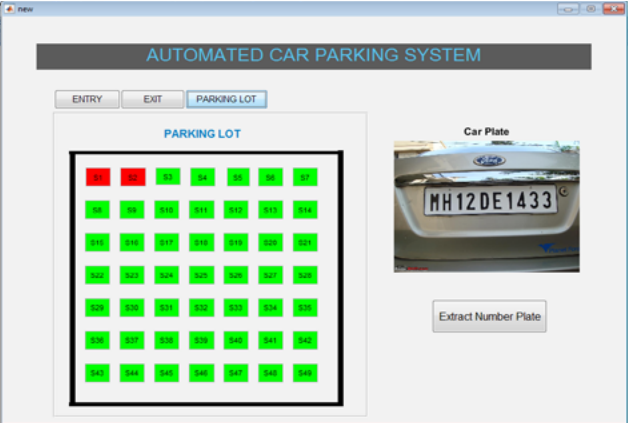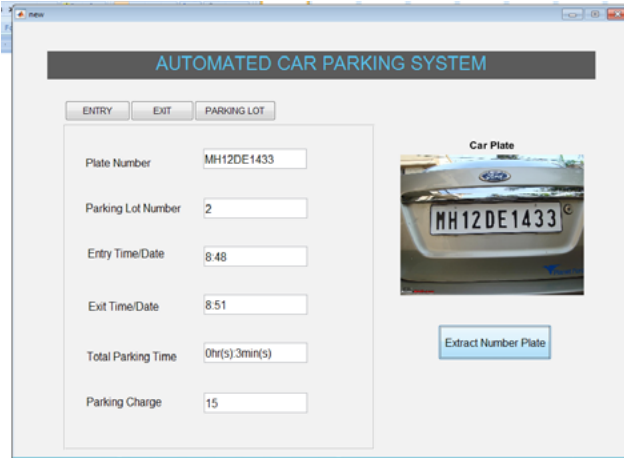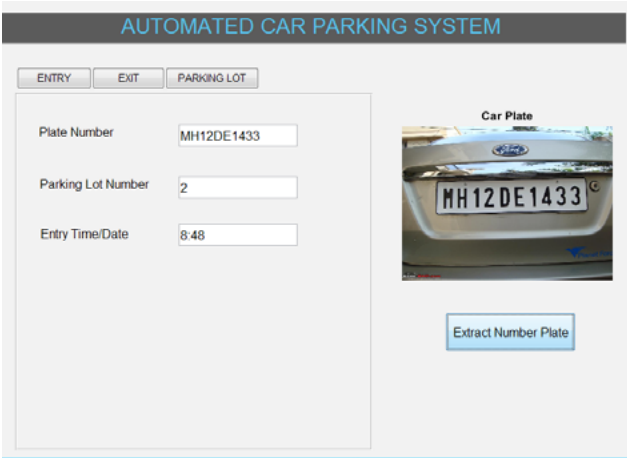
Skyball Boing

'Skyball Boing' was designed by Aliston Viegas (TYBSc-IT 2016-2017). It is a seemingly innocent-looking game which happens to become quite addictive soon enough.
It's got stunning visuals created using 3DsMax and Photoshop and a tremendously strong back panel and database support!

Mobile games are the lifeblood of the commute. They can make even the most boring subway, train, or taxi ride an excursion into the unknown. In today's world it is very tough to find a game that is suitable for all ages. Even if one creates a game that could be played by all the age groups, choices come into picture. Some people prefer a game of Arcade, while some people prefer a Role Playing Game, while others prefer Multiplayer games and so on. With the game industry moving forward with such propensity each year and game engines like Unity, Unreal, etc. providing tools to create a dream game for free; it is now possible to sit and create a game all by yourself. It does take a lot of time since you are in charge of the Graphics, Story-line, Modeling, Coding etc. But the fun that comes along with is worth it.

Just like 'Flappy Bird' a game that looks pretty easy, but drives even the 'hard-core-gamers' to their knees, my game— 'Skyball Boing' was made with the intention to cater to all age groups but to be tough at the same time. With an easy gameplay (just find your way to the end of the level), a simple scoring system (give scores based on how fast the player could finish the level), an amazing array of background-music, sensitive joystick and touch controls, the game gets addictive soon enough.

Now let's take brief look at the main functionalities of the game—

1)   The game starts off with an amazing video that was created using Wondershare Filmora, Animaker, Biteable and Animatron :


2)   After doing a lot of research on Google Cloud Messaging, I learnt that it is now obsolete. I was directed to another wonderful creation by Google, 'Firebase'. With Firebase one can 'easily' create databases, implement Login-Authentication, send real-time notifications, maintain the application if uploaded on the PlayStore, get a whole analytic report on how well your application is doing, introduce and manage advertisements to your app using AdMob etc. Best part about this is it works both on Android as well as IOS devices. So I did what anyone who wanted to expand his/her project would do, Implemented the Firebase Login-Authentication, Notification, AdMob and Analytics package. There no doubt was a lot of coding that is needed to be done, but I was free from the hassle of creating a PHP powered website and hosting it online.
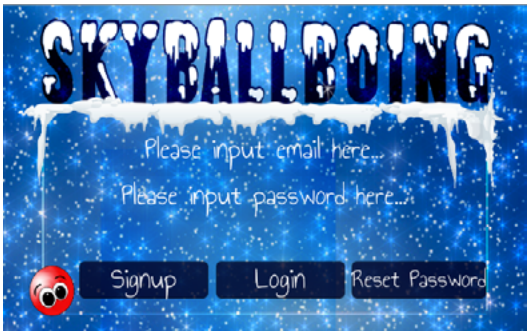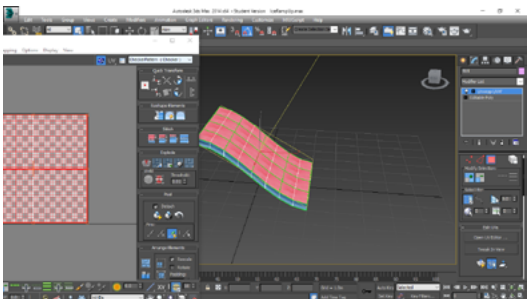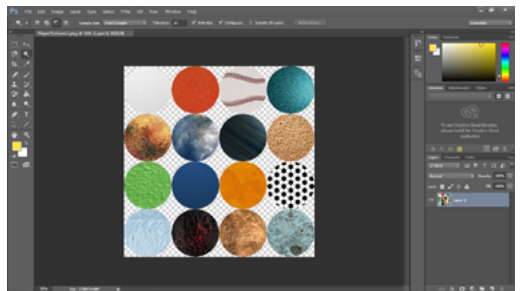
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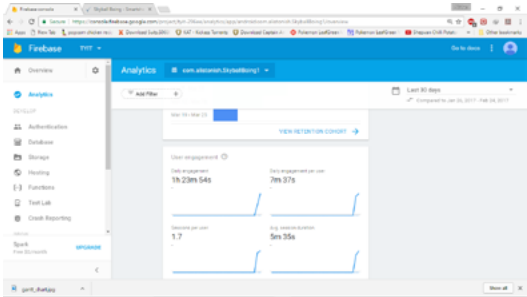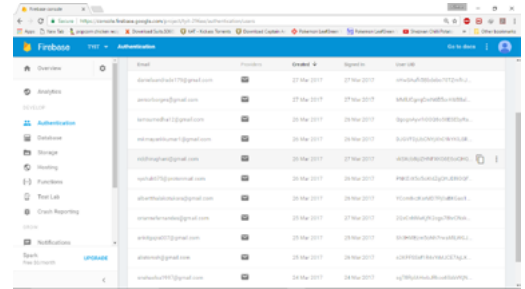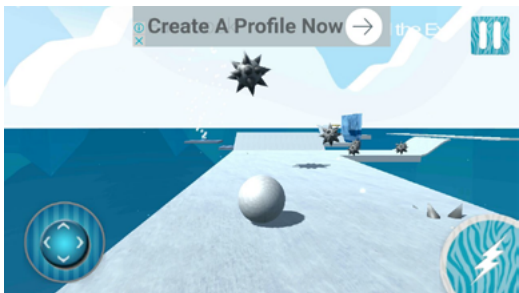

Analytics
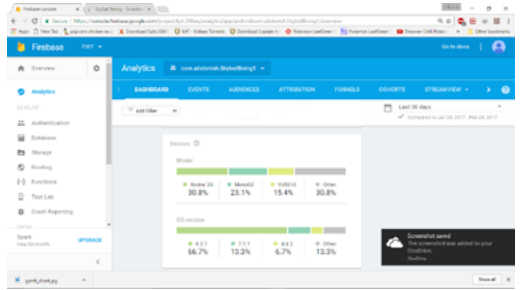
3) Now this is how the game looks, also most of the objects (Models and textures that you see in the game are created on Photoshop and 3dsMax.

3dsMax and Photoshop

Gameplay

Level Selection Screen

THANK YOU **CONTRIBUTORS!**

It wasn't easy to release the first edition of BITMAP. A lot of effort went into planning and creating this magazine, and a lot of people deserve credit for it. Of course, BITMAP wouldn't have been possible without the Department of Information Technology, so the biggest thank you goes to the department's faculty.

A magazine is only as good as the articles it has, and we wouldn't have had such a variety of innovative, deeply-researched content, if it weren't for our writers. As you may have guessed, the writers include not just the current IT students, but also students from the other departments in our college. We also managed to get a few articles from some ex-students of the IT department. A huge thanks to our pool of writers!

Our principal, Dr. Agnelo Menezes, encouraged our endeavour to create BITMAP, and also took the time to write a nice prologue for it. BITMAP really wouldn't have been possible without him, and for that, we are truly grateful.

We had our content ready, we had our designs ready, but we didn't have a medium to get them out to the people. That's where Mona Printers came in, and helped us print our premier lot of magazines! Thanks to them, we have been able to release a wonderful set of hard copies of BITMAP.

The Editorial Team truly appreciates everyone who has put in the effort to make BITMAP what it is.

WHO WANTS TO GO **NEXT?**

Sadly, the Editorial Team for BITMAP cannot be the same every year. Time moves on, and so do people. However, before we graduate, we want to try and get the names of some potential candidates down, who we think would be fit to be a part of the Editorial Team for BITMAP's 2nd Edition.

If you think you would like to bear the torch next, do send us an application at **sxb.itmagazine@gmail.com**. The application should include your full name, class and former experience in writing/digital design (if any) for a magazine, journal, newspaper, blog, etc. Please include a URL to your work, if it is present online. We look forward to hearing from you.

P.S. If you have any comments or critiques about BITMAP, and feel like sharing them, do write to us at the same email ID provided above.

FY-BScIT classroom at the iOS talk held in September 2016.

Mohit Agarwal (center) - Top scorer (BSc.IT)

The class of 2017

Prof. Lydia Fernandes
Prof. Rachna Pandey
Rector: Dr. (Fr.) Anthony J. D'souza S.J.
Student Alvina Cabral

Chief Guest: Prof. Sandip Trivedi
Prof. Roy Thomas
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