

# Digital Innovation Driving Media And Entertainment

Bhavin Patel (0882186)  
Department of Computer Science  
Lakehead University  
Thunder Bay, Canada

Dr. Jinan Fiaidhi  
Department of Computer Science  
Lakehead University  
Thunder Bay, Canada

**Abstract**— We all are lives in era that is mainly called the technological or we can say digital world and this new era is change the working of media and entertainment industry or we can say digital innovation has changed the whole world. There has been many changes in media and entertainment industry and also lots of changes in media industry ecosystem due to more disruptive innovation. The foremost digitization in media and entertainment are due to automation so we can say digital and automation is the same meaning defines in the worlds of innovation. The media industry is currently in the middle of a major disruption in creating and delivering its contents to the consumers. For Example You-tube, Facebook, Netflix, Apple TV, set top boxes, subscription apps, and many other innovations are changing the media technology. So in the nut shell digitization of media and entertainment is the main way to change the expectations and behavior of the youth who actually looking for easy access of all things anywhere and anytime.

So, we are going to do some innovation and automation in music with the use of java application as music will play and stop automatically with respect to the user input time(start/end) also user can manually stop, play, resume, pause and restart music by pressing specified key so it will enhance the user experience by having this automation in music.

**Keywords**—Technological era, digitization, media and entertainment, digital, automation, innovations, industry ecosystem, music.

## INTRODUCTION

To understand innovation and digitization first we have to understand different terms so first what is the “digital and analog “so digital means a system that stores data in discrete way and analog system stores data in continuous way. So, we can say that digital media is the electronic media that works using digital codes to create digital audio, video or other digital content so on the other-hand the older technology that makes audio and video with the use of continuous signal that is called analog media. A weather application on mobile phone, a fighting game on video games console and ultrasound devices in hospital or clinic which all are digital media products. All those products are easy to use, and gives the results and having fun in games that’s why that products are successful. Digital media is combine of technology and data and making a digital products that require team with people along with diverse skills which includes technical skills, production skills etc. Furthermore, this Digital media or we can say New media are defined or differentiate as highly interactive digital technology. This type of media are easily transformed, stored, and easily processed also it has power of easily retrieved and hyper-linked with easily searched and

accessed. The five main new media that describes the evolution of new media

- 1) Blogs
- 2) Virtual reality
- 3) Social media
- 4) Online newspapers
- 5) Digital games

Now what is the innovation – simply as new thinking, new ideas, new device but we can explain it in better way like that is the application of better solution that meets new requirement or existing market needs. Therefore, the term

digital innovation can be defined as something original and quite effective and as consequences that breaks into market.

Now what is media and entertainment -it is tools or outlet of collective communication that store or sends data or information and the media and entertainment industry consist of film, print, radio, and television. The word digitization-it is similar word of transformation so basically it means how media and entertainment technology are turning into new and innovative for of structure. The world we lives in today is by populated by digital media product and deliver experiences In many industry which are education, health and government. the today’s world digital media product can be found in

- 1) eCommerce
- 2) Games- console, online and mobile
- 3) Websites and mobile applications
- 4) Animation and video
- 5) Social media
- 6) Augmented And virtual reality
- 7) Location-based services
- 8) Data visualization
- 9) location- based information

Digital media include industries such as-

- 1) Entertainment
- 2) Ecommerce
- 3) Health
- 4) Education
- 5) Advertising
- 6) Marketing
- 7) Environment
- 8) Publishing

#### BACKGROUND INFORMATION

In past people were pretty limited when talking about enjoying entertainment at home because there were few terrestrial channels on tv and radio too and with that limited things there were little to do. But as far as when cable tv came all that trends changed and many people enjoying access to multiple range of channels also it added new games, consoles, computer technology, high speed of broadband which added the ability to enjoy a vast range of entertainment at home.

Here we are looking some of the changes that we have seen in the world of home entertainment.

- 1) Gaming technology - the gaming industry is too much vast and all people can enjoy all their favorite games in many different ways. Some people enjoy activities such as playing some games online and on the other-side some people enjoy hardcore single or multiplayer games with other peoples. So due to this technological change nowadays we don't need to go outside such as game-zone to play games because we can all enjoy and play that games at home now with the use of innovative gaming consoles and online gaming sites.



- 2) Reading technology - Actually if we see that past days we have seen that many people likes to seat down and read a book and magazines or news-paper but as the changes have made in reading technology we can now read all the books, magazines and news-paper online and also we can see live news, eBooks too.



- 3) Television technology / watching movies – we understand very well that it is too much expensive if we are going to cinema to watch movies with all of our friends and family together. But as internet came and with the use of streaming websites we can access all movies at home and access huge list of tv shows. and we don't even need to buy DVD because we can see everything with free of charge and online.



- 4) Listening to music – In the past we all listened music by buying cd and mp3 from the stores and with the Use of mp3 or cd player. However now people can access all of the songs and download all songs with the use of music download sites and people can also create their own playlists rather than buying mp3 or cd. So it is enhancing features in music industry as compared to the past years that we all can download music free of charge along with whatever musical genres you want.



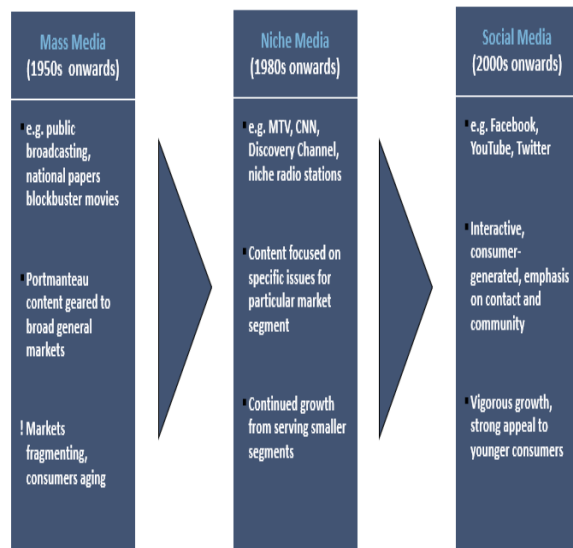
There are three types of media are available:

- 1) Mass media-  
We can define this type of media as diversified media field or technology that are mainly intended to richer large audience by mass communication.  
For Example :- broadcast media such as radio, film, recorded music and television.
- 2) Niche media  
Niche media are the media that is designed to appeal to a very less or we can say very specific number of audiences which means the content and references they include are very specific for mass audiences to understand or care about.  
For Example :- MTV, CNN, Discovery Channels etc.

### 3) Social media

We all know about this type of media but we can specify this type of media as it is interactive platform that catch up or bring all people with together for sharing of information or exchange of information.

For Example :- Facebook, twitter, Instagram, snapchat, etc..



We can also see technological change is continues to drive change because the broadband networks that is available can use anytime and anywhere which turning into mobile broadband which is also used by anytime and anywhere so more devices such as internet is enable then storage devices and their processing expand and get cheaper as compared to the past prices. And now we are storing data or information in clouds or network server so we can access that content from any devices and from any network server and we can also enable for transfer those Information or delivering those data.

#### DIGITAL TRANSFORMATION OF BUSINESS PROCESS

To provide enhancing user experience and to achieve better business value in an any organization the use of technology can be on right time and right place and it should be appropriate. To enable digital transformation and media and entertainment industry have to male and apply best strategy which connects the different things together such as people, departments, information, process and technology.

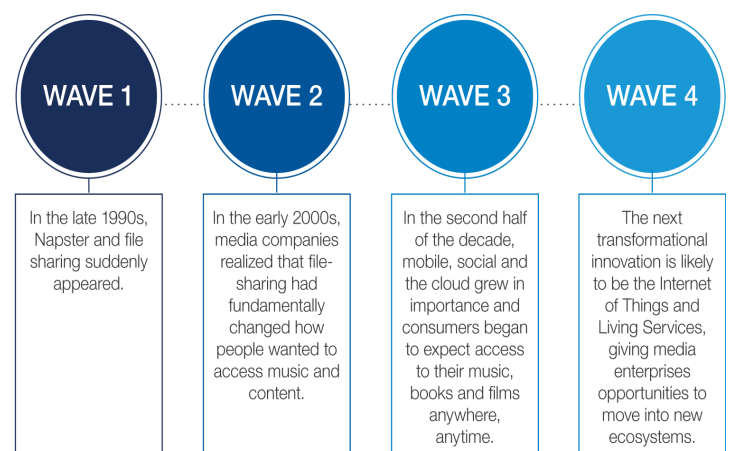
There are seven framework :-

- 1) Realize – For perfect digital transformation media and entertainment firm should have clear knowledge about how the things are changing in the field of business. Also they need to understand that the what strategy is adopted by others same firm also they have to check different geographic to check how the same strategy or business is getting done. By doing so that firm knows that they need to go for digital transformation or not

- 2) Analyze - this about what organization can do with the current process. they need to analyze the existing process and with the use of that info they have to identify what technological advancement they need to apply to get better revenue, enhanced customer experiences, and business agility. with having this type of analysis organization can improve the user experiences, sales and performance
- 3) Recognize – it means they have to identify the changes and transformation that they have applied to make better business changes such as communication, interaction, documentation.
- 4) Prioritize – the organization needs to re-think upon the what they have changed in the business process and come to decision that it was appropriate or not and assess capability, budget and resources etc.
- 5) Publicize – the firms need to be demonstrative regarding the benefits of the changes so they can enhance process so it will help the organization to re-invent to do better digital process.
- 6) Implement – it involves getting require budget, re-designing of the process with identified changes they have made and changes should also be tested with appropriate skills so its better for deployment.
- 7) Roll-out – this about making a new system that available for production usage it means devising clear and straight roll-out plan with identified objectives, responsibilities and timeliness.

So, the digitization is new buzzword that is change the way of business process that we are doing. By enhancing digital transformation media and entertainment organization can optimize their existing process, operation, strategy, and also explore new business process and opportunities to improve customer experience.

The below diagram Illustrate how the digital innovation or digitization has transformed the media and entertainment industry with respect to the time



## DIGITAL TRENDS- RESHAPE THE MEDIA INDUSTRY

Actually we have to think that from the past time in that we buying a news-paper and now opening a news app on tablet or phone, for watching movie from buying or renting DVD to streaming favorite movies or tv show on smart tv, from buying cooking book to have particular recipe on smart phone, it is unpredictable unbelievable, undeniable that digital transformation in media and entertainment industry has already started.

### 1) Demographics

- Global middle class grows – it reflect that all people in world and future world demand for new form of media that provide convenience, premium content and emerging economies.
- Older people – it will lead to increase demand for education, health and wellness, entertainment etc..
- Urbanization – it demands for media that designed to provide service for commutes with people.

### 2) New consumer behavior and expectations

- Changing consumer behaviors and expectations -all the youth wants to consume content all around the world and they only want a best services that is easily usable and accessible immediately.
- Editorial content, advertising and propaganda – no one can see the advertisement that is un useful so people can install the ad blocking tools.
- Content curation and delightful experiences – all the people wants that similar content is curate for them while see a video on you-tube or listening music or watching movies as editor is doing for paper magazines.
- Security, privacy and trust – nowadays all the people are aware that they have to work with data to daily basis so they understand that data can be analyzed and monetized by someone-else so provide a better transparency and better data privacy.

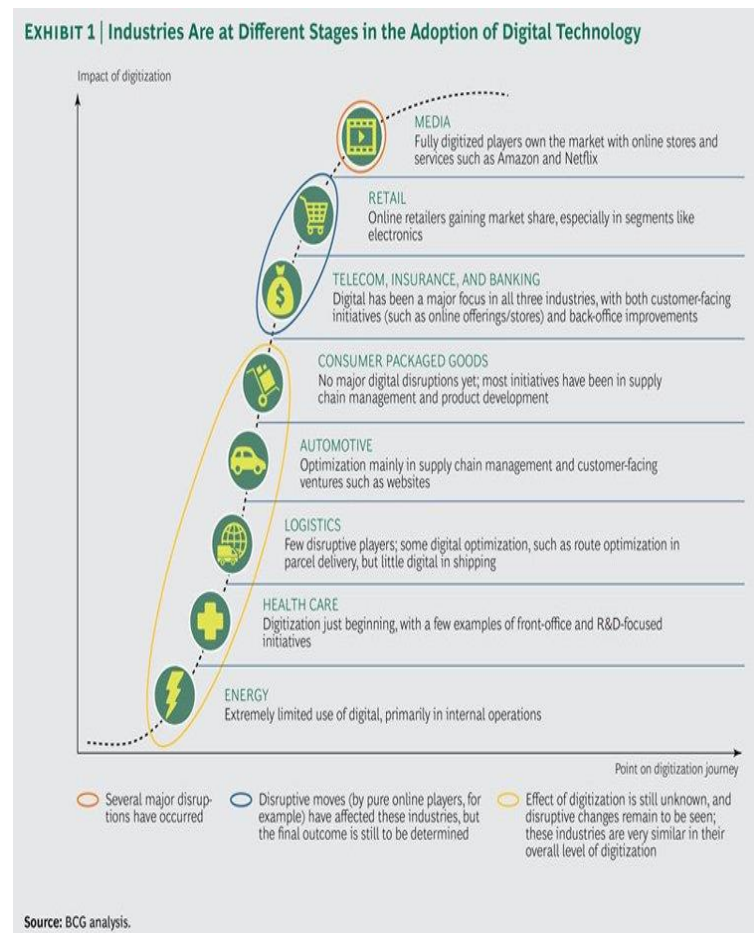
### 3) Ecosystem challenges

- Startup disruptions – talent require for access the new technology and making new business odel and process.
- Everybody is content creator – all the brands and organizations or firm assume the role and content of broadcaster for consumer attention.
- Access to financial resources – always creative people can find way to funding a new process products or services.
- The transformation of work - Digital transformation have a great impact on employment and making demand of highly skilled digital roles, while creating job opportunities redundant.
- Regulatory uncertainty – its about everyone wants that content that can be use from any tie and anywhere, but in some case it can't be possible due to some region or country criteria and rules so people are now using VPN(virtual private network ) to access those content for example using US Netflix account in UK etc.

### 4) Technology trends

- Data analytics and real time content management – if the industry collect the data and analyze that data then the they can deliver those type of content to the people across many channels and devices and allow to delivered relevant and meaningful experiences so they can give real tie data analytics.
- Mobile and social - The use of mobile and social media is converting how media is consumed and perceived and Continuous and instant access, mainly by sharing on social media, by that users to promote or left brands and organization.
- The industrialization of media industry - New digital strategy are transforming how media is created, distributed and monetized. also the media industry primarily focused on making content and reducing distribution, but today many companies are adopting automation, digitizing catalogs and inventories, making innovative management systems and writing programs and scripts or algorithms to create content.

Here is the diagram of different industry at different stage that adopts innovative technology or digital transformation in their business process or Strategy:





There are three digital themes available to outline above trends and which are mainly define the evolution of media and entertainment organization over the future -

1) Personalization and contextualization –

It is about that personalized content and personalized advertising need to develop by creator or marketer for those consumer who are busy with overload of information. These both development include the data security and privacy problem so those issues will have to solve by organization with transparently and ethically.

2) Content fragmentation –

As many information or content is display or distributed across many platforms, devices and media so broadcaster should have to exploit the second screen for advertisement or related useful content so people can directly use that without any problem.

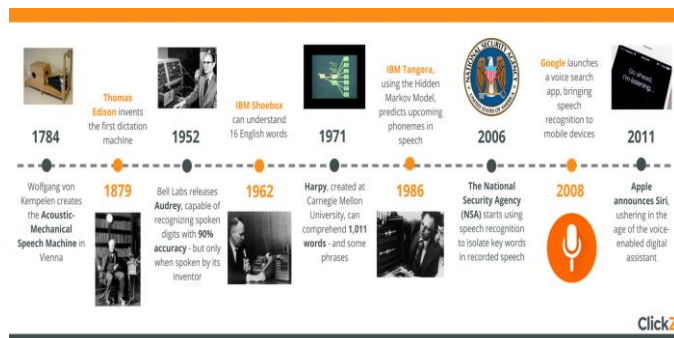
3) Partnership and industrialization –

Actually nowadays distribution and creation of content data and information have become more fragmented so for better result media and entertainment industry should have to partnership with each other. Therefore, all organization, firm and company should have to tune with each other for technological process effectively so they could balancing creativity, setting digital organization with digital transformation process of production and distribution of content.

➤The media industry has progressively expanded over past decades

Let's understand the timeline of speech recognition so in 1784 first acoustic mechanical speech machine created by wolfgang von kempelen and then after in 1879 Thomas Edision invented first dictation machine so that trends has been continued by time and in 2008 google starts voice search apps and after that apple launches Siri in 2011

Let's take another example of history of with respect to the time period in past 1910 there were only silent film then-after it has been converted to cinema and radio in 1920. As far as time gone from 1950 to 1990 black and white film television become color television and color television are turns into internet and Satellite tv. So from that we can say that broadcast tv, cable tv and satellite tv has been used through the 1990 and now currently we are using internet tv and user generated content such as Netflix, amazon prime, Hotstar etc.



There are few goals that organization should have to adopt to get better results :

1) Improve user experience

The basic function of every single organization is to retain and attract the customers. There are many ways to engage with your customer in this digital world such as by mobile apps, social media, personalized content and interactive media. And every firm adopts a technology that understands and engages with their customers. So it's all about to enhance the digital customer and end user experience to improve loyalty and productivity.

2) Streamline process

For enhancing the process, organization needs to remove the friction by applying some task such as to reduce cost and improve opportunities to have competitive advantage and also adopt a cloud platform for technology innovation for quick solution and de-adopt if they don't work out. It includes tasks such as integrated supply chain and differentiated offerings.

3) Optimize infrastructure and operations

It's about that which services meet the business and which services need to be deployed, integrated with existing technology and enforce security measures. So main tasks include with this are optimizing the operations to improve agility, flexibility, and cost effectiveness.

4) Simplify cloud services

Actually it is easy to purchase cloud services, but it doesn't mean that it will be easy to understand and manage for the users that what they are buying so its organization responsibility that ensures the right services are processed with the appropriate cost and with the use of this strategy of cloud service business moves faster, smarter, and with enhanced visibility and control. So, the main things that done with this is we should reduce complexity as solve issue before they are occur.

5) Utilize analytics

So when we are using a cloud, it comes to the cost because cloud cost are based on the hour you are used, the gigabytes that are used, or it will vary by or depend on the user so you have to pay that you use and sometimes we are using more than we think so organization should optimize cloud service and eliminate waste and improve application performance. Therefore, by applying utilization firm should make better decision and improve efficiency.

6) Increase automation

As we know this is the digital trends are going in the world so organization should needs the new process so that every things could be easy to access and with any less human efforts so it will be easy for every customer.

## CRITICAL REVIEW

There are many cons and pros are available for media and entertainment which are –

### 1) Risks

- 1) Daily life is being altered  
Nowadays Most of the younger generations are more interacting and connecting with each other with use of social media or with different ways but the main thing is that not all the people are thinking the same way so it's the problem that their sensibility and psychologies are differ from each other.
- 2) Blurring boundaries between private and professionals lives-  
As people are going and going more online to search immediate information, new generation leads the evolution in changing manner but older generation are catching all the things with surprisingly quickly.
- 3) Security  
It is the main concern in all the media and entertainment technology so its very necessary to protect personal data and digital identity from cybercrime.
- 4) Can be used with harmful intentions  
It can be use to spread propaganda and to only mobilize follower as example some terrorist group enforce publicity with the name of "jihaad".
- 5) Influence human decision making  
This is always happens through sharing of information or manipulation of information for example we can say voting process in which one group enforcing other people that vote this person and all.
- 6) Changes in social skills and sense of empathy  
So as people will more and more online there have possibility of bullying, teasing each other.
- 7) Impact on mental and physical health  
If the screen time is excessive or we can say if we seat on laptop with more hours then it will harm such as stress, less time spent with physical activities.

### 2) Benefits

- 1) Assistes social interaction and empower individuals  
It will helps in connecting people who are actually seperated by social, economic, cultural, political, and religious boundaries.
- 2) Facilitates education and life long learning  
As you are using new technology you get the opportunities to learn and know about innovation or what is the main idea behind that and also you can learn daily something new with the use of technolgy.
- 3) Enhances flexibility for worker and eployee  
As new technology arrives it will helps to worker that the work load they got in past are now reducing with the new machines and new structure of products so it is better to work with that type of environment so worker get less load with easy access of all techbology.
- 4) Consume less data

We can dowload all the things now such as movies, music, books etc but as the live streaming came now we can see all videos online and also we can play music online so it consumes less data as compared to download all of it.

- 5) Easy to use  
It means as all technology is being alterd with the new form of technology all the features are now enhancing with automation so automation will reduce the human efforts.
- 6) Saving time
- 7) Cost effectiveness

## DESIGN AND METHODOLOGY

We are implementing java web based application for play music as per the user input time as "start time" and it will stop according to the user input "end time". User have been given additional features like resume, pause and restart the song whenever he wants just by pressing the specified key. This type of application will be very helpful for the people who have a habit of listening songs before sleeping and meanwhile they sleeps and this reduce battery life and consumes mobile data, so in this case creating such application will resolve the problem.

Tools and technology :-

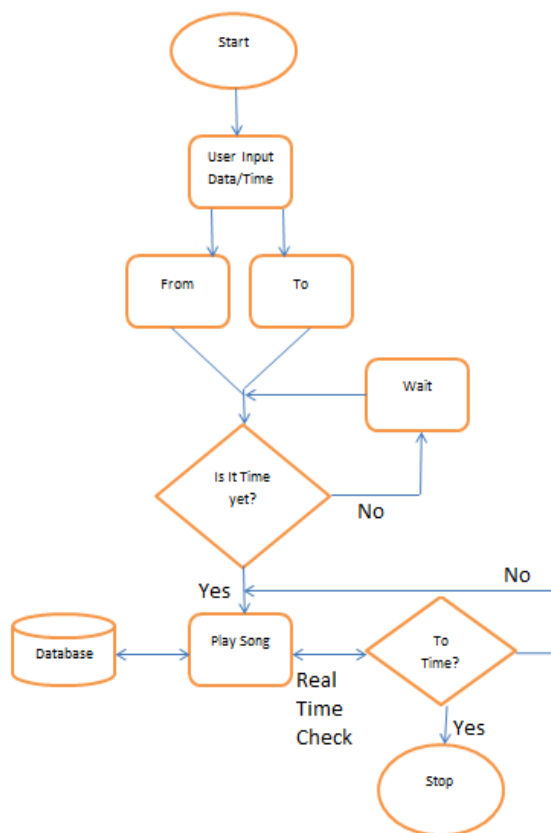
- 1) Java programing (java libraries, package and class related to audio and video has been imported along with java scheduler class).
- 2) Framework - Eclipse IDE (integrated development environment)
- 3) Music files in database (.wav or .au )

So this java application will take two input from the user "start time" and "end time". For the result Both the input time should be in specific below format: YYYY-MM-DD-HH:MM:SS where YYYY is year, MM is month, DD means date, HH means hour, MM is minute and SS is second. Basically start time is the time at which user want to play the music, if that is not the current system time then system will wait for that time and it will play song automatically when timing is matched from the music files location specified in the programming codes and It will stop playing music when user's "end time" is matched with system time.

Limitations :- as we are using java it can support and play only .wav and .au files.

## Block Diagram ----

It will gives basic information of the system that how it will works through step by step



## RESULTS

To get the result of the code first the data that is our music files needs to run this application with user input time and date. And we have to need .wav format music files because java doesn't support the .mp3 files java uses third party software so first we have to convert .mp3 files into .wav format by using the online websites or tools then and then only the application will run. Below is the screenshot of the music files which are .wav form

This PC > Local Disk (E:) > MUSIC CITY > prgmMusic

Name	Date modified	Type	Size
1jeene.wav	12-Nov-18 2:04 AM	Wave Sound	2,585 KB
Arash Ft. Helena - Broken Angel [Official Mu...	14-Nov-18 7:34 PM	Wave Sound	34,921 KB
Edward Maya - This Is My Life Official Video ...	14-Nov-18 7:34 PM	Wave Sound	39,911 KB
Justin Bieber - Baby ft. Ludacris_1 (online-au...	14-Nov-18 7:34 PM	Wave Sound	38,669 KB
love me like you do.wav	15-Nov-18 1:17 AM	Wave Sound	49,582 KB

Now after that it's time to gives the input time : "start time" and "end time". If the user's start time and system current time doesn't match then application will wait for the calculated delay time and when user's start time match with the system current time then and then only application will start playing music automatically. So as per the user input it will keep playing music for that specified duration and it will automatically stops when the user's end time is matched with current time. All the time activity has been done using java scheduler. Here is screenshot of start and stop the music as per the user input time.

```
TryMusicExploring [Java Application] C:\Program Files\Java\jre1.8.0_151\bin\javaw.exe (Dec 3, 2018, 12:44:24 AM)
Enter your start time in YYYY-MM-DD- HH:MM:SS format 2018-12-03 00:45:30
Enter your End time in YYYY-MM-DD- HH:MM:SS format 2018-12-03 00:45:45
47242 Delay in Milli Seconds
47 Delay in Seconds
Waiting for...
1. pause
2. resume
3. restart
In side play method
Playback started.
Playback completed.
```

User can also pause, resume, restart the songs manually by pressing some specified key. Here is the screenshot of that user can operate manually.

```
TryMusicExploring [Java Application] C:\Program Files\Java\jre1.8.0_151\bin\javaw.exe (Dec 3, 2018, 12:36:40 AM)
Enter your start time in YYYY-MM-DD- HH:MM:SS format 2018-12-03 00:37:00
Enter your End time in YYYY-MM-DD- HH:MM:SS format 2018-12-03 00:39:00
8058 Delay in Milli Seconds
8 Delay in Seconds
Waiting for...
1. pause
2. resume
3. restart
In side play method
Playback started.
1
music is paused
1. pause
2. resume
3. restart
Playback completed.
Playback started.
2
music is resuming.
1. pause
2. resume
3. restart
3
music restarted.
1. pause
2. resume
3. restart
```

## FUTURE WORK

There is always something that will improved in future with using of new form of proceess and technology. Therefore, there are sevarals new functionalities or enhancement that can be added to system to get a better results and easy access.

- 1) We can make one application of our system with use of android as alarm clock in which user can give start time and end time according to leisure time.
- 2) As voice- controlled technology is going on nowadays. it will expected that we can do more innovative with that technology in our system for better user experience.
- 3) The syetem can able to play .mp3 files or we can also add enhancing features to play .mp4 files too.
- 4) Also this application can be enhance by giving scrolling button option for entering start and end time instead of writing date and time.
- 5) We can also add forward and rewind option to get better access.

## CONCLUSION

Well there are no any feature to play and stop music automatically in the existing syetem ( exception Iphone have function in clock app where we can set timer to only stop music ) . Therefore, our proposed system will resolves that problem by taking input from the user. Furthermore, we must say that our system will help to those people who sleeps with listening music at night but fall asleep while music continue itself. So the music will keep on and drain phone battery and then it consumes more data. So our application will definitely save battery and reduce the data usage if the music is plays from on-line stream.

## ACKNOWLEDGEMENT

We are highly indebted and would like to thank Dr. Jinan Fiaidhi for their guidance and her immense help and support as well as providing necessary information also useful and valuable discussions and recommendations.

## REFERENCES

- [1] <http://reports.weforum.org/digital-transformation/digital-trends-in-the-media-industry>
- [2] <http://reports.weforum.org/digital-transformation/media-in-the-vanguard-of-digital-transformation/>
- [3] <http://www.businessinsider.com/whatsapp-64-billion-messages-24-hours-2014-4?IR=T>
- [4] <https://www.mendix.com/digital-innovation/>
- [5] <https://www.computer.org/web/computingnow/archive/february2015>
- [6] <http://reports.weforum.org/digital-transformation/wp-content/blogs.dir/94/mp/files/pages/files/wef-dti-mediawhitepaper-final-january-2016.pdf>
- [7] <https://www.scoopnest.com/user/ValaAfshar/745241104199618560>