

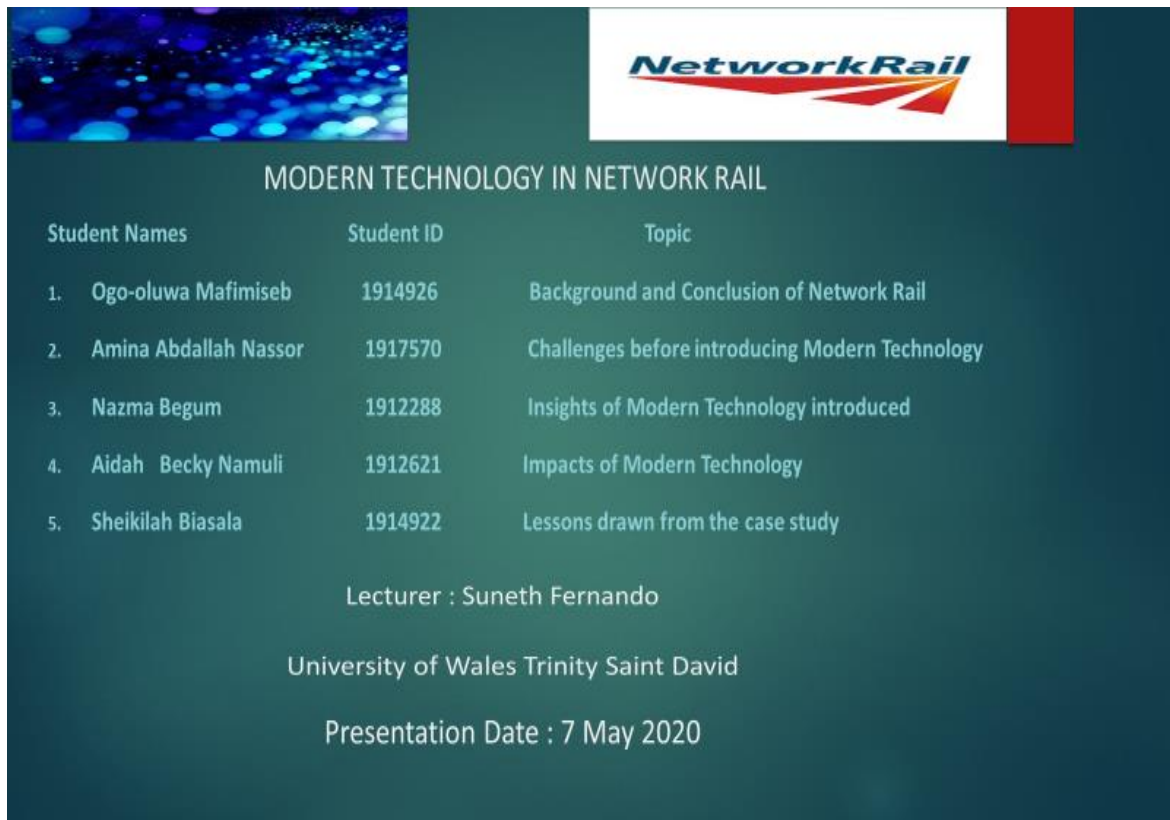
MODERN TECHNOLOGY IN NETWORK RAIL

SLIDE 1, 2 AND 3

Name of Presentaton,The backgroung of Network Rail and The History of Network Rail

By Ogo-oluwa Mafimisebi 1914926

SLIDE 1 : Name of the Presentation



The slide features a dark teal background. At the top left is a blue bokeh light effect. At the top right is the Network Rail logo, which includes the text 'NetworkRail' in blue and red, with a red and yellow stylized train graphic below it. The title 'MODERN TECHNOLOGY IN NETWORK RAIL' is centered in white. Below the title is a table with three columns: 'Student Names', 'Student ID', and 'Topic'. The table lists five students and their topics. At the bottom, the lecturer's name 'Suneth Fernando', the university 'University of Wales Trinity Saint David', and the presentation date '7 May 2020' are listed in white.

Student Names	Student ID	Topic
1. Ogo-oluwa Mafimiseb	1914926	Background and Conclusion of Network Rail
2. Amina Abdallah Nassor	1917570	Challenges before introducing Modern Technology
3. Nazma Begum	1912288	Insights of Modern Technology introduced
4. Aidah Becky Namuli	1912621	Impacts of Modern Technology
5. Sheikilah Biasala	1914922	Lessons drawn from the case study

Lecturer : Suneth Fernando

University of Wales Trinity Saint David

Presentation Date : 7 May 2020

2 : The background of network rail.



The background of Network Rail.

- On the 3rd of October 2002 Network Rail take control of responsibility of rail network. (politics,2012)

On the 3rd of October 2002 Network Rail take control of responsibility of rail network just a few Month after being set up, preliminary evaluation of its inheritance where exposed more than 20% of train were not running on time. While the report of 28th March 2003 weep for lack of investment seen in recent years.

By 31st of March 2004 because of the initial good start, Network Rail saw 7% reduction in delays while the acquirement of funding worth £22 billion over a five years period it to begin improving the network. In July 2004 white paper the government rewarded Network Rail with new responsibilities handing over monitoring and train performance reporting duties from the abolished strategic Rail Authority within this period Network Rail increase the number of its employees by 100% by taking maintenance in-house (Politics,2012).

SLIDE 3 : History of Network Rail



History of Network Rail

- Network Rail mandate when they took over the Britain railway infrastructure in 2002 was to improve safety, reliability, and efficiency on Britain railway network. (Ctp, 2015)

Network Rail mandate when they took over the Britain railway infrastructure in 2002 was to improve safety, reliability, and efficiency on Britain railway network and since then they almost reduce the cost of running the railway by 50%, increasing its reliability to record level significantly improved train punctuality and also made the network the safest in Europe.

This organization is run on a not for divided basis, which mean almost all the profit they will be making instead will be reinvest inti improving the railway network the is the reason they don't have shareholder, before they took over the railway had been starved of investment despite the considerable amount of money spend on the network during privatization. The year 2003 Network Rail began a massive ongoing program of renewing the track, signals, power, and telecoms equipment. This leads to first joint operations control central been opened at Waterloo Station in early 2004 (Ctp, 2015).

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Available at: <https://www.politics.co.uk/background-of-network-rail>.

Assessed on: {19/04/2020} at 23:52.

Available at: <https://www.ctp.org.uk/our-history>.

Assessed on {20/04/2020} at 06:13.

SLIDE 4,5 AND 6

Challenges Facing Network Rail before introducing modern technology

By Amina Abdallah Nassor 1917570

Slide 4



Challenges facing Network Rail before introducing modern technology

- Growth of demand. (Anon., 2017)
- Slow adoption of Building Information Modelling. (Suchocki, 2017)
- Lack of commitment on programmes. (Hibbert, 2001)
- Handling public's telephone inquiries. (Anonymous, 1999, p. 9)

Growth demand

Since the mid1990s, people and cargos from different side of the country used train as a means of transport especially on peak hour. Therefore, the growth of

demand is increasing the pressure of railways performance, thus, led to capacity crisis. (Anon., 2017)

Slow adoption of Building Information Modelling

Due to the system's legacy, the sector failed to provide Designer and Constructor the adequate data for accurate location of ground assets and nature of geological sub-layer. This led in re-surveying a workflow under inspection rather than using accurate existing data which hinder building information modelling process. (Suchocki, 2017)

Lack of commitment

The industry has lack plans and commitment from Railtrack, the train operating companies and the Strategic Rail Authority to implement programmes of train protection system which controls speed and avoids trains passing red lights on high speed trains on the London train disasters at Southall and Ladbroke Grove. (Hibbert, 2001)

Handling public's telephone inquiries

After the privatization of British Rail, the sector has inconvenience moment handling public's telephone enquiries about train time, this is because, at that time every train operator (25 train operators) have their own enquiry centres. (Anonymous, 1999, p. 9)

Slide 5



Challenges continues...

- Conventional signalling system that limit the railway capacity. (Takagi, et al., 2006)
- Insufficient Information Technology (IT) Skilled. (Mari, 2009)
- Increasing competition on the services chain. (Anonymous, 2013)
- Centralized structure. (Pisu, 2015)





Conventional signalling system

The industry failed to meet customer and merchandise needs, this is because the industry used conventional signalling system that caused conflicts at junctions and mixed traffics at the main railway lines, thus, led trains to delays because it became difficult to manage junctions. (Takagi, et al., 2006)

Insufficient Information Technology (IT) Skilled

The industry has growing pressures of having insufficient IT Skilled staffs, due to redundancies and unemployment. Therefore, the growth in unskilled staffs and technology changes have hindered the industry's pathway from traditional to IT skilled. (Mari, 2009)

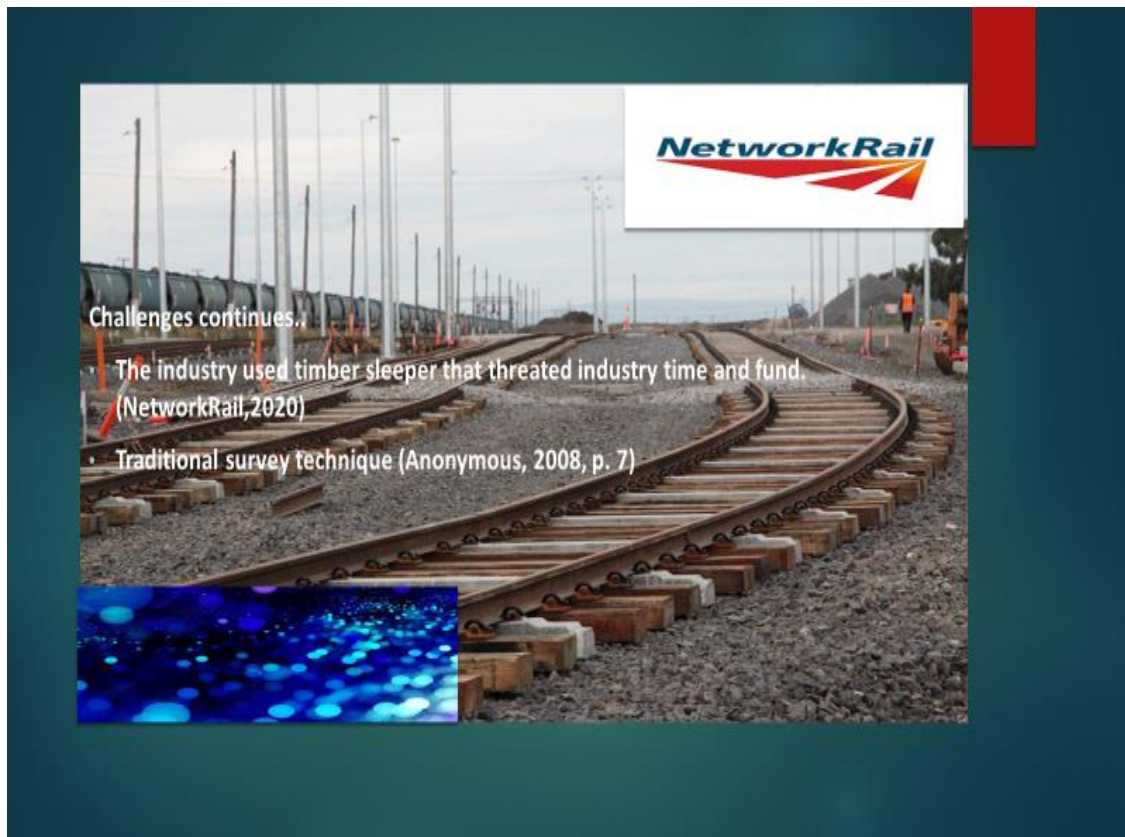
Increasing competition on service chain

There are tremendously competitive markets on passenger as well as merchandise services in rail. Therefore, the industry faced the competition with other train operators such as rolling-stock providers and merchandise sector to become a runner of franchises. (Anon., 2013)

Centralized structure

The industry has put more attention to bureaucratic rather than commercial management and decision-making, whereby, all the power for decision making is centralized by the government. Actually, this created adversity for the local routes to answer to customers as well as to have effective alliance with operators. (Pisu, 2015)

Slide 6



Using of timber sleepers

The industry used timber railway sleepers to lessen the pressure moved to the tunnel. Therefore, the industry disbursed time as well as money to cut that wood sleeper to size. (NetworkRail, 2020)

Traditional survey techniques

The industry used the traditional survey technique such as closure whole station for maintenance. Thus, this closure, may lead to distress and inconvenient for railway users. (Anonymous, 2008, p. 7)

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SLIDE 7 AND 8

Insights of Modern Technologys introduced on Network Rail

By Nazma Begum 1912288

Slide 7



Insights of Modern Technology introduced on Network Rail

- Downtime is a disadvantage of cloud computing as it works through the internet
- Malware infections that unleash specific attacks
- Breaches can be made with customers or business partner
- User data can be accessed by anyone

Using cloud computing is an exceptional idea for network rail as customers will benefit from it as it is a shared computer resources and with that there are disadvantages with using this modern technology. Cloud computing requires constant internet connections if this is very slow it doesn't work too well with low internet speeds. Internet failure can lead to costly downtime as it can take time to access your remotely stored data. Also there are risks when storing data on the internet. The data stored data can be liable to cyber attack and be lost

and it may not be secure. If something goes bad it effects the whole company (www.businessnewsdaily.com)

Security can be compromised in an event of a system attack which may happen. There is a chance other people can access data which they are not permissible to do so. (www.datapine.com) Data can get lost and will be difficult to get back.

Slide 8



Network Rail

Insights of Modern Technology introduced on Network Rail

- New technology used will help protect the organisation data
- Data will be easily accessible for employees and stakeholders for a longer time
- Cloud based services will improve customers experience for users
- On demand resources are available

Cloud computing is a new technology used by network rail. Cloud computing is a computer based technology which is internet based. Cloud computing is an on demand service which uses computing resources to provide services to multiple customers. Cloud computing is a on demand service which is easily accessible. It

is an automatic system which analyses the data needed and supports capability at some services. (www.data-flair.training.com)

Cloud computing involves cloud storage which involves storing data on a hardware in a remote physical location which is made available from any device through the internet. Clients would need to send datafiles to a data server controlled by a cloud provider instead of previously storing it on a hard drive. Cloud computing involves the usage of the internet to complete tasks you may have traditionally done on a personal computer. Cloud computing can handle anything from storing uncomplicated data to storing complicated and complex data. There is no wastage of paper as it is all done on the internet. Cloud computing overall is a great new modern technology which will benefit their customers and stakeholders.

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SLIDE 9 AND 10

Impacts of modern technology on Network Rail

By Aidah Becky Namuli 1912621

Slide 9 : Positive Impacts of Modern Technology in Network Rail



Modern technology has enabled train tracks to be electrified and to use signalling for trains to move from one station to another. Due to the electrification and signalling, the trains travel faster reducing delays (The Station: Troubles on the Track, 2020).

[Text Wrapping Break]Air surveillance choppers have a Thermal Imaging Camera which helps to detect any overheating on the lines and in case of rain and flooding the rail team uses a weather forecast to plan journeys (The Station: Troubles on the Track, 2020).

Construction of bridges and rail replacement has been made easier due to the sophisticated machinery and techniques such as the ElevArch jacking technique (Network Rail, 2019).

Liverpool Lime station was upgraded with a 4D virtual reality technology which displays images based on the data received from the site (Network Rail, 2019).

Modern technology has increased the efficiency of the railway transport however, it has brought about negative impacts, although the positive impacts outweigh the negative ones

Slide 10 : Negative Impacts of Modern Technology in Network Rail

IMPACTS OF MODERN TECHNOLOGY CONT.
Negative Impacts
By Aidah Becky Namuli
1912621 BMSW4003_LON

 POOR SIGNALLING (THE STATION: TROUBLES ON THE TRACK, 2020).	 HIGH TRAVEL FARES (TOPMAN, G., 2019).	 REPARATION AND CONSTRUCTIONS (R., 2017).
 STRIKES ANON., 2019	 WILD ANIMALS AND HUMAN MORTALITY (SCOTT, 2010)	

Network Rail

Technical faults in the system set off alarms, this causes misconnections and cancellations leading to delays and overcrowding on stations. Bad weather such as flooding, landslides can brutally damage tracks which can provoke major reparations (The Station: Troubles on the Track, 2020).

High travel fares cause stress to passengers using the railway transport. Activists claimed that passengers faced increased fares due to rises in planned tariffs (Topman, G, 2019).

Constructions and reparations of the railway transport system can cause trembling of the soil which can lead to fractures and falling of buildings within the proximity of the railway (R, 2017).

When unions and railway workers decide to go on strike, it affects the railway transport system whereby such an action leads to rescheduling of journeys (Anon., 2019).

Wild animals and human mortality are unenviable due to electrocution on tracks. Incidents are reported due to people trespassing and shunning the rail safety and standard regulations (Scott, 2010).

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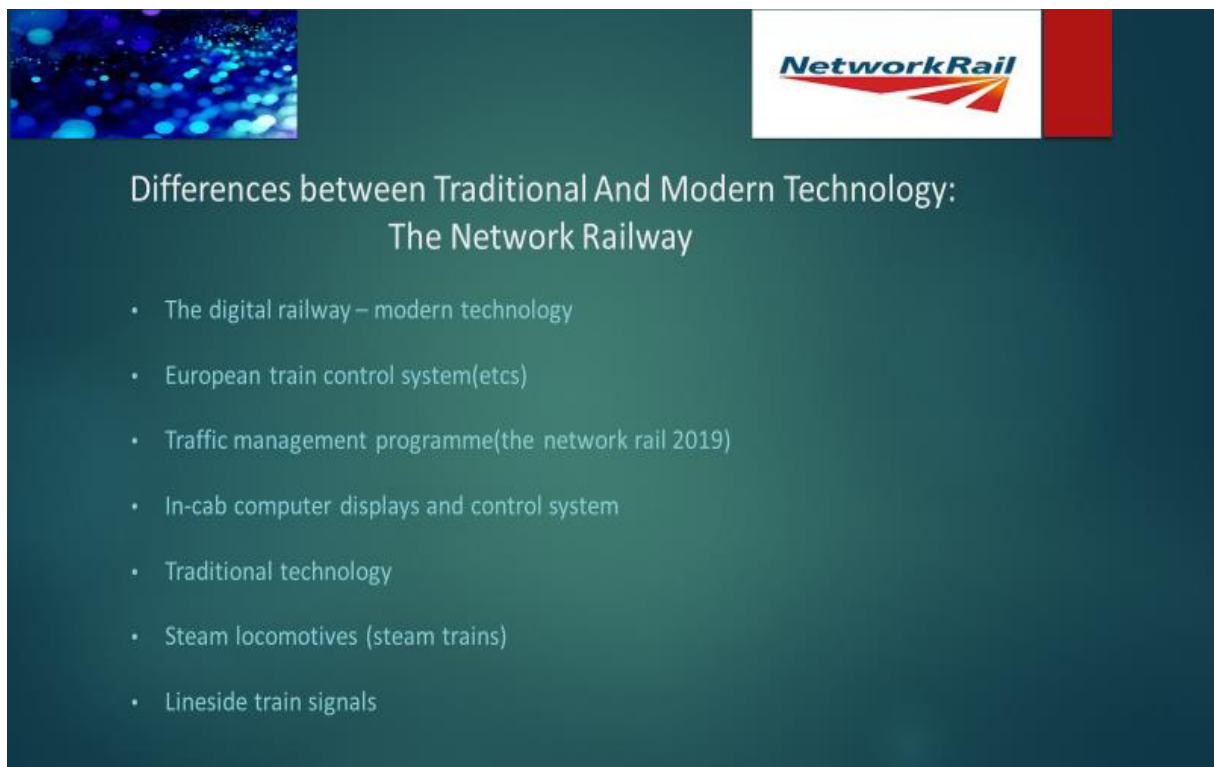
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SLIDE 11, 12 and 13

Lessons drawn from the case study

By shekinah biasala 1914922

Slide 11 : Differences between Traditional And Modern Technology: The Network Railway



Differences between Traditional And Modern Technology: The Network Railway

- The digital railway – modern technology
- European train control system(etc)
- Traffic management programme(the network rail 2019)
- In-cab computer displays and control system
- Traditional technology
- Steam locomotives (steam trains)
- Lineside train signals

One of the main differences I had found between traditional and modern technology it's the way trains use to operate back then. For example, traditional trains use to use steam locomotive (steam engine) however now are trains are powered by Diesel and our network rail run on digital technologies now such as:

The digital railway strategies – the reason for this programme its to modernize the network with In-cab signalling to replace Britain's traditional lineside signals,

and new traffic management system to improve the way the network is run. Moreover, our network rail has installed sophisticated computerised and automatic train control systems: these improve capacity and performance across the railway allowing more trains, better connections and greater reliability.

New traffic management: Operational Decision Support Tool (ODST) this system is an isolated system which helps operators manually intervene and make decisions. Also, this new digital technology helps operators manage the timetable – reducing delays for passengers and freight operators.

The digital railway programme includes replacing existing trackside equipment with European Train Control System (ETCS) in-cab signalling systems and state of the art control centre systems.

Slide 12 : Why modern technology is important for the organization



Modernising Britain's railway to benefit passengers and support economic growth

By introducing new digital technologies along with targeted conventional interventions it's a cost-effective way of releasing significant additional capacity on the existing network, as has been proven on London Underground.

The digital programme: it's a plan to change the rail network for passengers, business and freight operators by deploying modern signalling and train control technology to increase capacity, reduce delays, enhance safety and drive down costs

Modern technologies help the network rail work more safely and efficiently, leading to better outcomes.

By developing new modern technologies, the organization becomes more reliable and provide better performance and experiences for their passenger's.

New modern technology development helps provide better and more journeys as demands for train services continues to increase.

New train technologies improve the environmental outcome how by replacing steam engine with digital technologies it lessens the harm done to the environment

Slide 13 : Consequences of not using modern technology in the organization



Consequences of not using modern technology in the Network Rail



AFFORDABILITY AND ASSET SUSTAINABILITY



CAPACITY AND PERFORMANCE

By not using new modern technologies there would be a crazy amount of train delays and overlap between different engineering teams.

The network rail organization will become unreliable and unsafe for their passengers.

Without modern technologies Potential risks and hazards would increase.

By not keeping up to data with new technologies the organizations economic growth will be affected.

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SLIDE 14

Conclusion

By Ogo-oluwa Mafimisebi 1914926



Great Britain is where industrial development and many technological innovations originated, and it has evidenced on how modern technology has help organization into progression of basic computing and information technologies. Firm started with handmade tools to computerized tools, onto inventing even more sophisticated technology. Modern technology has allowed Network Rail to do things the rest of their competitor thought that he can never do or achieve and had made people having a better and easier way of commuting, this has showed that with good technology you can rule the world of work.

THANK YOU.