**INMR 86 - Business Technology Consulting**

**Analysis Report on Different Methods, Models and Tools for Developing Consulting Solutions through Business Technology Consulting in Wigglesworth Hospital Trust (WHT)**

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3. **Abstract**

This report provides detailed analysis on Consulting solutions for Wigglesworth Hospital Trust. Wigglesworth Hospital Trust has a set of key areas for improvement and aims which require efficient solutions and implementation methods. This hospital was formed from two local hospitals hence has duplicated systems. Dr April Truscot is the Chief Medical Officer at WHT and has identified the key aims to achieve in 2020 which are as follows –

* To reduce the cost by 20% and increase the productivity at same time by 20%
* WHT wants to be the best hospital for Elective Surgery

These are the key aims of WHT, however, there are other areas which require attention to achieve the above two goals. Mainly the systems which are being used, their sanity needs to be evaluated and the hospital architecture to be modified to best practices.

Significant problem areas which will be discussed in report would be duplicated systems, obsolete legacy systems, shortages of beds, patient safety etc.

The report is focused on presenting various methods and models for business consulting and their critical analysis. DMAIC method is used to present the problem and solution process. Strategic tools like SWOT analysis to reflect upon internal strength and opportunities have been combined.

Further, we have explored many models, tools, methods, and framework of consulting in this report. In Consulting Models and Techniques – we have explored 80/20 rule, simulations, cost-benefit analysis, cost-reduction framework, benchmarking, first principle and BSSV, PBSP and ISCB namely Business Service Strategic Value, Perceived Business Service Performance and IS criticality to Business.

These techniques are used with the data shared by WHT and further analysis presented. We have reflected on what is the current framework at WHT and how/which applications are duplicate or obsolete. Then, the solution is presented with all facts gathered around the case study and methods. RAG reporting is used to present the final recommendation on IT infrastructure.

IT infrastructure can improve and optimize the operation’s however to be best regional hospital in elective surgery does relies with hospital’s doctors and staff.

At the end limitations of methods, tools and frameworks is discussed.

**2. Business Context & Strategic Analysis**

Business context constitutes various factors which impacts the organization from different perspectives. In this context, external environmental factors, internal factors, stakeholders play the key role.

One of the effective tools to understand the problem and to improve the process is **DMAIC process from Six Sigma** – In context of Wigglesworth Hospital Trust, we will follow this process to amplify the problem and improvement process –

* Reducing Cost and Increased Productivity
* To be best Hospital for Elective Surgery
* Strategy Analysis
* Consulting Methods
* Develop Solutions
* Ensuring of achieving the goals through sustained solution
* Analysis of processes/services in WHT
* Evaluation of All analysis and methods
* Implement the best solution for purpose of achieving the goal statement

WHT has the clear goal of increasing the productivity and to be best hospital for elective surgery. We have found the various restraints in terms of IT systems when conducting this analysis. To achieve the targets, we are taking all relevant factors into considerations. We will further present few more powerful analyses to represent the current state of WHT and to reflect on internal and external checkpoints.

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| **SWOT Analysis of WHT (Wigglesworth Hospital Trust)** |
| **Strength** | **Weakness** |
| Patient Admin System (PAS) available in Hospital. | Duplicated Systems because of Merger |
| As-is analysis available with insights | Obsolete systems require costly maintenance |
| Clinpro Expert System for Clinical Procedures Exist in current framework | Bed Management Issue |
| Many other applications available in the framework | Unskilled Staff |
| **Opportunities**  | **Threat** |
| Scope to become best Hospital in Elective Surgeries | Patient Safety |
| Introduction of Central IT Systems in Hospital | Legal Complications |
| Outsourcing Opportunity | Insurance Abuse |

Based on SWOT analysis, organization can understand their Strength and Weakness which are biggest internal factors. Basis on these, hospital needs to grasp the opportunities and avoid the threats which can become a risk to hospital. There are many applications already existing in the IT Structure of Hospital, however, there is a scope for improvement. We will further discuss the other methods to bring meaningful outcomes. There are opportunity lies in outsourcing as well, this is to be done in regards of Pharmacy analysis.

WHT needs to remove the old systems and clean up the existing inventory to reduce the costs on obsolete systems.

Another goal for WHT is to be best hospital for elective surgery. These surgeries are scheduled by patients in advance and not required in emergency as life saving options. These can be cosmetic procedure or surgeries like sport injury, Bariatric surgeries, Hernia Repair, Eye Surgeries or removing the tonsils etc.

This goal can be accomplished if WHT builds effective strategy in deploying team who can schedule the surgeries in advance and closely monitor the after care as well. For this, WHT needs to manage their operations carefully so they can run uninterrupted while they can build further on their strength for achieving the goal of 2020.

There are many external factors as well which affects the environment of WHT and are as follows -

All these external factors also affect the strategy and governing methods in industry of health care. For example, **Political intervention** can be there in healthcare policies and other national situations if they may exist. **Technological advancements**, new tools and innovations are impacted by techno part. GDP and PPR are the factors influenced by **Economic environment**. **Socio-cultural** factors are affected by the demographic variables likes age, family size, education etc.

**Identified Components of Strategic Business Context**-

**3.Scoping Strategic Problems and Priorities**

Report will present the holistic view of IT Portfolio, Analysis which enables WHT to strengthen their competitive position, performance, and productivities. As the title depicts, client’s strategic problem will be focus of this section.

Problem’s detail are available from the information shared by WHT.

1. High Cost
2. Duplicated Systems
3. Obsolete Legacy Systems
4. Bed Management for shortages of Beds
5. Use of Paper Based Process
6. Management of lawsuits

Other than key issues, there are key priorities of WHT highlighted by Dr April Truscot

1. Reduce Cost by 20%
2. To become best regional hospital for elective surgery
3. Increase outsourcing for some applications like pharmacy analysis
4. Improve Bed Management
5. To increase Digitalisation and Automation (Technology)

WHT has mentioned that they want to develop architectural model to reduce the costs and to fulfil the objectives as their aim of 2020. Also using cloud technology is in the later plan of hospital.

**4.Different Methods, Models and Tools for Developing Solution**

IT Consulting Solution refers to a model/processes which has elements of IT & technology and aligns with the Business Processes and Services with the view of improving them in the long period of business. To find the best solution for achieving business goals, there can be multiple rounds of developing solutions, testing/analyzing them and repeating the same process.

In Business Technology Consulting, we also call it as **Enterprise Architecture Solution**. This is divided into three layers and can be seen through following flow chart –

There are most-widely used management consulting techniques and frameworks and we shall have a brief description of each-

**Cost-Benefit Analysis –** When working on a project, we need to estimate the cost associated with benefit when planning a solution. Usually, there are number of analyses drawn to reach to a conclusion in this technique.

**80/20 Rule –** This rule is also called Pareto Principle. This is still used and a very old rule. This basically means that business decisions are drawn based on not all targeted customers but most important 20% customers. This means 80% of the profit comes from 20% customers and 20% of the process is responsible for 80% problem. This technique helps with important and difficult decisions.

**Benchmarking –** There is no sure short outcome of a business solutions and if there is then reaching the bigger aims are sometimes far in the future. There are benchmarks to mark the progress as per the industries. Consulting helps with various benchmarking used globally and reports back on the status of business problems and solutions.

**Theory of Constraints and Bottlenecks –** Instead of optimizing every process, in consulting we find the weak spots and slower process so the focus and optimization can be done there to have the outcomes. Optimizing the whole process is sometimes waste of efforts and cost and working on main bottlenecks and constraints serves the purpose.

**Simulations –** Simulations in easy language means to compare all the available options, drawing simulations can be on any tool but most prevalent is on Excel. Among all available solutions, we can find the optimal one.

**First Principles –** This method is a favourite one of Elon Musk. This means to find out the basic rule and driver which is causing the problem and needs solution. It is used when one is drawing the solutions or models from the scratch.

**Cost-Reduction Framework –** Cost cutting framework relies on four main elements and then further segmented – Below picture sums it up and it is applicable on many industries.



Like cost reduction, there are many frameworks available, namely

* **Sales and Margin Increase Framework**
* **Scaling Sales Framework**
* **Inventory Reduction Framework**

**Make or Buy Analysis –** It is to calculate to complete a project or work internally or outsourcing a piece of business work outside. It depends on the efficiency of internal resources and the cost while taking this decision.

**Headcount Optimization –** One or the other time in business, this must be done to usually lower the cost by reducing employees.

**BCA Analysis –**

BCA puts forward the strategic issues of Business Operations in articulated Manner. From this method, we can identify the long-term plan and strategy of the business. It also deals with internal and external stakeholders.

It makes sure that core competence of the business is used as competitive advantage and business drivers are recognized. Values of the business are also highlighted so that it should add to customer’s benefit.

Key output of this Method is issue drivers (idr’ s).

Financial Projections can also be made using this method.

**Business Service Profiling (BSP) –**

Business Service Profiling breakdowns the business operations into services. It explains the position of a business service in organisation. BSP helps us to identify the strategic value of a certain service and the perceived performance of a service towards the strategic goals from business and social perspective.

All this analysis is worked through **Business Service Value Model (BSVM)** and **Business Service Assessment Technique (BSA)**.

BSSV – Value & PBSP - Performance

BSP Technique

BSVM – Model

**Business Service Strategic Value** – BSSV measures the criticality of business service to the organization. It is measured on the scale of 1 to 5 where 1 being the least critical and 5 is the most critical.

BSSV is a output of Business Services Profiling in Business Service Assessment Technique.

It can be used more than once for different service domains.

**Perceived Business Service Performance –** PBSP is based on the Pugh Matrix and represent the stakeholder’s view on social values of the business service. It is generally derived through questionnaires.

BSSV and PBSP when combined can provide valuable output for decision-making in organisation. For example, high BSSV but low PBSP score will mean that a critical service is not being performed at satisfactory levels.

**IS Criticality to Business Service (ISCB) –** ISCB is dependent upon the importance of IS service which is supporting business service. A scale of importance from 1-5 is used to understand it’s importance where 1 means not important at all and 5 means very important. These values are derived from the senior stakeholders in business.

There are many more models available as per business needs. Their effective implementation can help companies to identify challenges and optimise the business processes. It also provides a visual reference for better understanding.

After identifying the correct problem, positioning, needs, and improvements required – business can pick up the effective model from the most widely used one’s like –

**5. How Models are used to support the resolution of Business Technology Consulting Problems**

**Grade of Hospital Systems and Services –**

WHT has categorized the services in hospital into four groups as per the urgency and criticality. These groups are categorically divided and named from A to D.

**Category A** – System and Processed running 24/7 and are very critical – working on front line

**Category B** – Services and System for daily support of the Hospital – Less critical than A

**Category C** – Administration and accounting Systems

**Category D** – Least Critical Systems and Services and are very low impact

The above grading is already used by WHT as Business Service Value however grading is given in letters not in number 1-5. This grading is already provided hence we will take it as **BSSV**.

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| **Business Services - Hospital System and Services** | **Grading or Business Service Value Grading (BSSV)** | **Type of Service at WHT** |
| Systems running 24/7 - High Priority | A | Elective Surgery & Patient Safety |
| Service and System for Daily Support | B | Providing Treatment & Daily Checks for Patients |
| Administration and Accounting System | C | Allocating Staff, Discharge of Patients, Scheduling Internal Tests and Check-ups |
| Least Critical Systems | D | Billing & Cash Collection, updating records and manage relationships with external stakeholders |

We are going to establish relationship of critical business services with IS service and the different applications associated with them to find a feasible solution to the problem.

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| **Grade A- Applications and Services** |
| **Application Name** | **Clinical Service** | **IS Service** |
| PAS (Patient Admin System) | Prepare patient for SurgeryPerform elective surgeryPerform post-surgery proceduresManage patient recovery | Update patient recordManage patient notesUpdate patient record with vital signs Details, dietary details, and record of recovery |
| Clinpro Expert System | Prepare patient for SurgeryPerform elective surgery | Update clinical path guidanceLog surgical proceduresProvide clinical path guidance |
| Bluespier | Perform elective surgery | Manage patient notes |
| MOBLOOD | Check Bloods | Haematology Management |
| Medilab - Lab Info system | Check Bloods | Haematology Management |
| Haematopsys - blood analysis | Check Bloods | Haematology Management |

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| **Grade B Applications and Services** |
| **Application Name** | **Clinical Service** | **IS Service** |
| PAS patient admin system | Schedule Elective patientSchedule patient admission | create new patient recordSet patient admission |
| PIS Pharmacy Information System | Provide Anaesthetic drugsManage Anaesthetic recoveryProvide recovery drugs | Drug Dispensing ManagementAnaesthetic Drug Dispensing Data Management |
| Anaesthetics system | Administer Anaesthetics | Manage anaesthetic record |
| Ana pro | Manage Anaesthetics Vital signs | Log vital signs  |
| Vitalstok | Provide vital signs drugs | Vitalstok |
| Bluspier | Schedule supplies | schedule consumables |

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| **Grade C Applications and Services** |
| **Application Name** | **Clinical Service** | **IS Service** |
| PAS patient admin system | Admit patientDischarge patient | Update patient health statusUpdate record |
| Bluespier | Schedule staff | schedule staff diary |
| ORIS | Schedule room | schedule theatre |

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| **Grade D Applications and Services** |
| **Application Name** | **Clinical Service** | **IS Service** |
| HFS Hospital finance system | Log costs  | Maintain cost records |
| PAS patient admin system (billing module) |   | Maintain cost records |
| LAHL | Update local authority records | update local authority health records |

From the above categorization, we have the following findings:

1. PAS is being used in range of activities from Grade A to B
2. Clinpro Expert System is used only regarding Elective Surgery and does not need to be changed as Focus on Elective Surgery is our prime area.
3. For the service of Check Bloods, there are three applications falls under Hematology Management, these applications either needs to be redeveloped and merge into one or two are to be removed, leaving one.
4. Scope of Bluspier and ORIS can be combines into PAS hence removing these applications can help with cost saving.
5. Pharmacy Information System can be outsourced.
6. Anaesthetics system needs to be redeveloped as it’s important for patient safety and Anapro should be removed because it’s obsolete.
7. Vitalstok and LAHL can be combined with redevelopment of PAS hence can be removed from infrastructure.
8. Hospital Finance System should be redeveloped as finances are important to track.

Here is the detailed view presented for WHT about what to keep, buy and change in their existing systems –

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Application Name** | **Notes** | **Grade**  | **Remarks** | **Function** |
| PAS patient admin system | Cost reduces to 0.2 after 1800 user. 793 users were registered in the 2011 audit | (A-D) | Redevelop/Replace | Set up and maintain patient action record |
| Bluespier | 243 users were registered in the 2011 audit | A&C | Remove | Hospital resource management |
| ORIS | 167 registered users | C | Remove | operating room information system |
| EQUIDOX | 156 users | C | Redevelop/Replace | hospital consumables management |
| Clinpro expert system | 213 users | A | Retain | expert system support for clinical procedures, care bundles and algorithms repository of clinical best practice |
| Medilab - Lab Info system | Used by 123 users. Upgrade cost would only increase users to 160  | A | Redevelop/Replace | Analysis of blood analyser machine data and creation of graphs, tables and feedback information in hospital format  |
| Haematopsys - blood analysis | Used by 153 users upgrade doubles capacity | A | Blood results reports for clinical staff (text based) |
| MOBLOOD | upgrade would double the number of users from 56 , further upgrades to double this number would be half the price | A | Graphical and text-based blood results reports for clinical staff |
| PIS Pharmacy Information System | currently 97 users. Upgrade cost would be to double users ie 100-200 | B | Outsource/Remove | a mobile hospital helpdesk application for mobile phones checking the results of blood tests that is linked into the new PAS system and enables online tracking of blood test results |
| **Application Name** | **Notes** | **Grade**  | **Remarks** | **Function** |
| Anaesthetics system | 115 users, upgrade cost to increase users to 200 and latest version with graphics | B | Redevelop/Replace | Record management system for anaesthetic data and decisions |
| Ana pro | 185 users. No upgrade option as obsolete system supported via India (outsourced by suppliers) | B | Remove | equipment datalogger and database management |
| Vitalstok | 67 users (max 100 users on current licence) | B | Remove | drug stock management system |
| HFS Hospital finance system | 145 users. Upgrade would mean a replacement via PAS once capability available | D | Redevelop/Replace | Database of all hospital patient costs  |
| LAHL | 17 users. PAS has a reporting module that could be adapted | D | Remove | crystal reports |

RAG Reporting technique has been used to depict the decision for which applications can remain in the system, which are to be removed and where redevelopment is needed.

This coding is also performed keeping the user count in consideration to avoid the training of new application in staff. After having this analysis let’s look back the series of issues we had identified if we have the supporting answer to them –

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| --- | --- |
| **Key Problems** | **Solutions** |
| High Cost | Cost Reduction will be done by removing the unrequired infrastructure and the associated licensing cost |
| Duplicated Systems | Duplicated Systems have been identified and will be removed |
| Obsolete Legacy Systems | Obsolete Systems have also been identified and will be removed |
| Bed Management for Shortages of Bed | Real- Time Dashboards and Intra level communication can be promoted to have a fix for this problem |
| Use of Paper based Process | Efficient PAS will fill the need of digital records |
| Manage of Lawsuits | Control of Legal Risks with Systematic Medical System – Included in |

**Further dive in into the Bed Management issues at Hospitals –**

It looks like a simple activity, but it goes inefficient in most hospitals and leads to the limitations in treatment of critically ill patients and results with following undesired outcomes:

* Patients wait for long period in Emergency Rooms with less desired settings
* Referred to other Hospitals many times
* Delays and cancelled surgeries

An efficient Business Process Management tool can help with the following activities –

* Real time ability to track available beds
* Admission Requests
* Real time notifications
* Multi-User Login

The standard work – flow used to solve the business issues with technical tools or business process goes as follows –

As a summary, here is the consolidated count of applications suggested to removed/replaced or retained.

|  |  |
| --- | --- |
| **Decision Drawn** | **Count of Remarks** |
| Outsource/Remove | 1 |
| Redevelop/Replace | 5 |
| Remove | 5 |
| Retain | 1 |
| **Grand Total** | **12** |

WHT’s first goal of reducing cost by 20% in year 2020 should be fulfilled by the proposed changes in the process management and the infrastructure linked.

Second Goal is more derived by performance which is to become best regional hospital for elective surgery. To achieve this, a constant hustle within the entire team of doctors and employees can bring the results, already specialist doctors are there which makes this field a core competency of WHT. Usually, patients select the hospital for such processes basis on three factors which are – short distance, expertise of hospital and the reviews.

Basis on available info, WHT fulfills the three criteria.

**BCA Analysis –**

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| **Business Context Articulation** |
| Organization Name - Wigglesworth Hospital Trust (WHT) | Date - 04/12/2019 | Version No - 1.1 |
| **Organizational Aspects** | **Document Reference** | **Key Factors** | **Issue Statement (is)/ Issue Metric (im)** |
| Description of Organization | Regional Hospital | Performing Elective Surgeries |   |
| Vision and Mission | Vision: To become best regional hospital for performing elective surgeriesMission: Providing Enhanced Quality of Medical Services and Patient Safety |   | Issue Statement: Merger of two local hospitals and formation of WHT has resulted into duplicated systems, high cost, lack of Skilled staffs, Bed Management and Lack of Digital Technology issues.Issue Metrics: Cost, Performance, Number of Errors, Bed Availability, Surgery Success Rates and increased count of surgeries |
| Business Strategy | Grasp Opportunities for performing elective surgeries and optimum utilization of available resources in terms of funds/applications/employees |   |
| Business Drivers | CostPatient Safety - Medical ServicesBed Management - Efficient ProcessesAutomated/Technological ProcessPerformance |   |
| Core Competences | Use of Patient Admin System (PAS) in Hospital for managing the patient's databaseClinpro Expert System developed for elective surgeries for doctors |   |
| Principals (Code of Practices) | Focus on Medical Services and Patient Safety as a most important Task |   |
| **Business Structure** |   |
| Organizational Chart | Dr April Truscot is Chief Medical Officer at WHT. |   |   |
| Strategic Unit | Technology Equipment’s/Applications, Hospital Facilities, Systems already in Place, Knowledge |   |   |
| External Stakeholders | Patients, Local Communities, Government etc |   |   |
| **Financial Summary** |   |
| Statement of Cash Flow | Not Provided |   |   |
| Income Statement | Not Provided |   |   |
| Statement of Financial Position | Not Provided |   |   |
| **Issue drivers (idr)** | **Description** | **Notes** |
| Duplicated and Obsolete Systems | Due to Merger, many systems are duplicated and outdated, and staff is not properly trained to use them. | Dr April Truscot has main aims of reducing cost and to be best regional hospital for elective surgeries. |
| High Cost | Hospital's aim is to reduce the cost by 20% in year 2020 |
| Bed Management | There is a shortage of bed hence bed management is a issue. |   |
| Patient Safety | The key issue is to manage litigation with patient safety. Hospital is managing the extensive database for it. |   |
| Automation and Digitalization | A lot of paper use is there, and hospital wish to move to digital workspaces. |   |
| **Recommendations to IT Application** | Develop system/process which can recognize the duplicated process/systemsResult into automation and analysis to facilitate outsourcing/reducing costs |

From BCA Analysis, strategic business issues have been identified. We have the issue statements and recommendations for IT application as well. Generally financial information is also analysed through this method, but this information is not provided by WHT. 5 elements of strategic problem have been identified: Issue Drivers are –

1. Duplicated and Obsolete System
2. High Cost
3. Bed Management
4. Patient Safety
5. Automation and Digitalization

**Perceived Business Service Performance (PBSP) –**

PBSP scores are available from “As-is” analysis provided along with case study.

As-is analysis provides the questionnaires filled by important Stakeholders for three services wherein they have shared the ranking from 3 to -3. -3 is extremely not satisfied and 3 is extremely satisfied. There are 12 different criteria on which services are ranked.

Below is the explanations of all Criteria through which PBSP scores are calculated in the case study’s provided details.

|  |  |  |  |
| --- | --- | --- | --- |
| **No** | **Criteria Name** | **Criteria Weight** | **Criteria Explanation - To assess whether the business service** |
| 1 | Contribution to the business niche | 0.10 | contributes to the organisation |
| 2 | Ability of know-how | 0.20 | has clear objectives  |
| 3 | Service Timelines | 0.05 | is the service provided in the agreed timelines? |
| 4 | Communication Protocols | 0.01 | has the service an open service feedback mechanism? |
| 5 | Efficiency of production | 0.05 | is the service efficient in providing the best service to customer? |
| 6 | Contribution to end customer's expectation | 0.10 | fulfils customer’s expectation |
| 7 | Adequate knowledge/Skills Required | 0.10 | provides opportunities to the associated stakeholders to enhance their knowledge and skills in the business |
| 8 | Risk to Operations | 0.15 | possesses risks in its operations |
| 9 | Risk Effecting the Business Network | 0.05 | failure risk impact to other business serviceassociated in the business network |
| 10 | Risk impacting on Business sustainability | 0.15 | Is the service able to sustain to risk of change in the business environment |
| 11 | Security Risk | 0.01 | Is the security risk of the service, e.g., information security good or bad? |
| 12 | Business Adaptability/leveragability | 0.03 | is the service adaptable to the changes in the business environment |

To have solution for the problems we require the BSSV and PBSP values regarding the services which are critical to business.

The information provided in Case Study is insufficient to produce solution by the BSV and PBSP metrics. Moreover, this method is highly complicated and complex in nature.

There are many formulas to reach on the value of service and its position in business processes. Basis on those values and rankings consulting solutions are generated in a constraint manner. The methods used towards reaching the solution are simple yet effective in Business domain.

**Conclusion and Limitations**

Blend of basic consulting rules like 80/20, simulations, theory of bottlenecks and constraints, and cost reduction framework has been used in this report for solving the problems produced by the case study.

Successfully the simulations have been applied and results have been drawn from consulting point of view towards formulating solution plan. Various methods have been explored while working at this project. We have figured the solution of major problems being faced by WHT and the plan of their major goals to achieve in 2020.

The work presented is vastly limited in terms of scope shared in the case study, not all information like financial data and stakeholder’s unfiltered point of views were available. Hence the limitation of data available applies on the limitations of tools and methods as well. - Methods applied can provide the outcomes in theatrical manner, however, real world challenges can be present while putting them in action.

* Expertise in Elective Surgery can only be possible through the Hospital Doctors and Staff, and it is a limitation to the Methods and Techniques Discussed
* The solutions and the problem can have a glimpse of assumptions as it is not a practical problem we are dealing with and are not aware of all available aspects.
* Techniques like BSSV, PSSB were inefficient to produce the result with the provided information
* BCA method has identified the issue drivers; however, it was the strategic problem which was earlier identified.

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